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Book of Abstracts

FLARE

12

Gender Equality and Sustainable Management of Forest Ecosystems in Kenya

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Abstract

This article presents a complete examination of the ramifications of anthropogenic environmental change on orientation fairness and supportable improvement in Kenya's backwoods biological systems. The main objective of examine the relationship between climate change and sustainable development with gender equality in Kenya. The research methodology employed a vigorous mix of both secondary and primary information sources, utilizing a combination of qualitative and quantitative exploration strategies to extensively address the complex interplay between anthropogenic climate change, gender equality, and maintainable improvement in Kenya's woodland biological systems. The examination was led more than a three-year time frame, spreading over from 2019 to 2022. The discoveries of this study shed light on the complex convergences between environmental change, gender balance, and manageable advancement in Kenya's woods ecosystems. The examination highlights the earnest requirement for exhaustive interventions to moderate the unfriendly effects of climate change on weak communities, especially ladies, and advance fair and strong improvement pathways. Projected climate change represents a diverse danger to gender equity and sustainable development. It goes about as a strong danger multiplier, enhancing existing weaknesses and fueling instability in a portion of Kenya's most volatile districts. These climate-induced pressures stretch out even to somewhat stable regions, exhibiting the broad ramifications of environmental change on cultural elements. Our recommendations, the execution of gender-responsive strategies that perceive ladies' jobs and commitments in timberland biological systems, and capacity-building projects to improve ladies' information and abilities in feasible timberland executives. The review highlights the pressing need to address gender disparities in forested environments. Coordinating ladies' viewpoints and knowledge in forest management choices is fundamental for accomplishing economic advancement objectives. By engaging ladies, improving their cooperation, and carrying out gender-responsive strategies, Kenya can make ready for fair and tough forest management. All in all, accomplishing gender uniformity and reasonable woods for the executives in Kenya requires coordinated endeavors to engage ladies, perceive their commitments, and incorporate gender-responsive arrangements. By recognizing ladies' jobs as stewards of nature and supporting their dynamic interests, Kenya can forge a way toward fair and tough woodland biological systems that benefit the two individuals and the climate.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student level

Ph.D.

13

Exploring the Nexus of Forest Property Rights, Income, and Rural Multidimensional Poverty. An Empirical Study in Diverse Tenure Contexts in Ethiopia.

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Abstract

This study investigated the nexus between property rights, forest income, and rural multidimensional poverty in Ethiopia, focusing on the Gimbo district in southwest Ethiopia, where diverse forest land tenure exists in tandem. The study *empirically examined forest property indices and computed rural multidimensional poverty, moving beyond traditional income-based measures. Furthermore, by empirically measuring forest income, both subsistence and cash, according to established standards, the study offers a comprehensive understanding of the role forests play in household well-being.* Drawing data from 514 forest-dependent households, the study uncovered the pivotal role of forests in augmenting household income, particularly among poor households. The finding indicates that private forests generate the highest income, predominantly driven by forest and semi-forest coffee production, community and state forests also make substantial contributions. However, disparities in income distribution are evident in each tenure, favoring male household heads, specific ethnic groups, and non-poor households. Notably, community forest lands emerge as vital in minimizing these inequalities, highlighting the importance of inclusive management approaches. The econometric analysis further validates the positive and significant role of forest property rights on forest income generation and poverty alleviation. Our findings emphasize the imperative to strengthen forest property rights, ensure equitable benefit distribution, and empower community forest management for sustainable development. In the broader context of human well-being, poverty, and forests, this research offers insights into fostering more incentive-based, inclusive, and equitable forest management practices, with implications for policy formulation and implementation.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

14

Rural Transformations Within Infrastructure Corridors On The Edge of The Tropical Jungle: Livelihoods, Natural Resources, And Sustainability In Laos

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Abstract

In Laos, amidst concerted efforts to address urgent threats to natural resource sustainability, challenges persist in promoting sustainable rural transformation, particularly in the context of infrastructure development. This research focuses on understanding the intricate interactions between large-scale infrastructure projects, such as the China-Laos Infrastructure Corridor, and the sustainability of rural livelihoods dependent on natural resources.

The unprecedented development of the China-Laos Infrastructure Corridor, exemplified by projects like the China-Laos Railway and Expressway, has brought both opportunities and challenges. While these infrastructural advancements hold promise for economic growth, they also pose threats to the environment, with implications for deforestation, biodiversity loss, and the livelihoods of rural communities reliant on agriculture, timber and non-timber forest products.

Using a mixed-methods approach including semi-structured interviews with rural Laotian inhabitants and Chinese rural migrants, alongside document analysis, this research aims to comprehensively investigate the impacts of the infrastructure corridor on livelihood opportunities. Moreover, it seeks to evaluate emerging conservation initiatives within the region and their potential for fostering sustainable livelihood transformations.

Drawing upon frameworks of Political Ecology and Sustainable Rural Livelihoods, the study anticipates shedding light on the nuanced dynamics at play, including potential injustices among different groups along the corridor. By exploring strategies and outcomes through the lens of sustainability, the research aims to illuminate pathways for sustainable rural livelihoods amidst evolving infrastructure paradigms in Laos.

The anticipated outcomes of this research include insights into how infrastructure corridors influence rural livelihood strategies and outcomes, with the aim of catalyzing shifts towards sustainability and forest conservation. By addressing the challenges and opportunities inherent in large-scale infrastructure development, this study contributes to the broader discourse on forests conservation and livelihoods, offering valuable lessons for policymakers, researchers, and practitioners engaged in conservation and sustainable development initiatives.

Keywords: Sustainable rural livelihoods; conservation; infrastructure corridor

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

17

International Forest Governance: A comprehensive global review

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Abstract

Numerous national and international organizations with different mandates and capacities, aware of the threats to the world's forests, are adopting instruments and programmes designed to protect forest conditions, livelihoods, and human well-being. Nonetheless, in global terms, forest protection seems to be failing, since the pace of deforestation continues at "alarming rates" according to the latest State of the World's Forests report published in 2022 by FAO.

A well-coordinated global forest governance is vital to collectively improve forest conditions, livelihoods, and well-being. Many organisations recognise this need for coordination, especially when taking into account that forests play a key role in any cost-effective climate change mitigation action, and that while the role of countries through intergovernmental organisations remains an important component, other actors such as non-governmental organisations, both for-profit and not-for-profit, also play an important role in decision-making. This inclusion of new actors and relationships is being institutionalised in a variety of ways, creating new structures of transnational policy networks and partnerships that affect not only forests, but also the livelihoods and human well-being depending on them.

Although the number of actors, institutions, and instruments has been steadily growing in the past decades, increasing the complexity of international forest governance, information on how they operate and interact is scarce and scattered. To amend this shortcoming, we completed a comprehensive, peer-reviewed, scientific assessment of the available information at global scale. The assessment gives a general overview of the main changes occurred in the past decade, delves into the forest-related finance landscape, analyses the current forest-related discourses, and provides alternative governance design options for the future.

Besides contributing to increase the knowledge of the academic community, the assessment serves to inform ongoing policy discussions on the 2030 Agenda for Sustainable Development, and provides input to the future sessions of international processes relevant to forests policies and issues, such as UNFF, UNFCCC, CBD, or HLPF. More informed decision-making at global level will benefit in particular low- and middle-income countries, support poverty alleviation, and help preserve biodiversity and other forest services.

Primary FLARE Theme

Forest governance from local to global

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Forms of collaborative approach: Analysis of interactive methods, processes and their implications to support integrated landscape approach

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Abstract

Globally, there is a need to a deeper understanding of methods and processes that support collaborative practices in integrated landscape approach. To address this gap in research, we conducted a scoping review to identify and synthesize literature related to applied methods that foster collaborative approach in natural resources governance. Our aim was to learn from applied methods and practices and how they could support an integrated landscape approach. To limit the literature search, we decided to limit natural resources to forest, water, land and landscapes, based on the areas of research our team members are familiar with. The scoping review identified 19 155 articles and through intensive literature screening the team identified 384 relevant articles. Findings include that there is a wealth of different methods and tools available related to support collaborative approach such as knowledge co-creation, participatory mapping and modelling, games and visualizations, negotiations, creating consensus and agreements and scenario development. However, we find that the majority of these methods and processes either failed to create social impacts or did not create long-term collaborative partnerships. In terms of integrated landscape approach, these type of short term and externally funded and driven development interventions and decision-making practices can prevent change, even though the collaborative approach as a whole should practice and support deliberative decision making and values, such as openness of administration, citizen participation, and cross-sectoral collaboration.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

20

Towards a Geopoetry of Mangrove. Inhabited Mangrove, Imagined Mangrove.

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Abstract

Between fascination and repulsion, the mangrove nourishes many imaginations and narratives, leading to ambivalent policies, depending on the actors and the historical and geographical contexts. For a long time, mangroves were perceived as hostile swamps that could only be inhabited by people who were themselves savage. This dominant colonial vision is reflected in policies of control, from radical conversion at the end of the 19th century to coercive protection. One of the latest avatars of this imperialism is the craze of the blue carbon credits. Mangrove's policy is a good illustration of nature's grabbing and commodification, which lead to environmental violence.

Through an approach combining environmental history, social geography and political ecology, this communication highlights the mangroves' strong power of inspiration and their pluri-versity. Favoring a long-term approach, this communication feeds in one hand into the history of the mangrove's perception, mobilizing oral and written sources; in the other hand, it is based on a corpus of ethnographic data, collected on more than 40 years, in fieldworks conducted in West-Africa and more recently in Viet-Nam and India, with a gender lens. The communication focuses on the narratives of the fisherwomen and their innovative strategies to face globalization.

Among the main results, the communication shows the system of values attached to the mangrove, the ability of the women for preserving their heritage, closely linked to their territory and identity and their power and empowerment thanks to their multiple use system of mangrove, their knowledge, and their mutual support.

Beyond the case studied, the communication invites to deconstruct the dominant and often reductive narratives on the mangrove, and decolonize the views of scientists, decision-makers and mediation bodies. It shows the habitability of mangroves, the attachment of people to them, their materiality but also the imaginary. It examines the forms of expression best able to convey their pluri-versity, and explores the French literature of the Caribbean and Indian Ocean in particular.

In conclusion, the communication calls for inter- and trans-disciplinary studies that will enable to co-construct desirable futures and for geopoetry to apprehend the mangrove it in all its evocative power.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

23

Impact of different conservation and extractive governance mechanisms on forest loss and carbon emissions in the Amazon: 20 years of evidence

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Abstract

Calls have mounted for the identification of effective area-based conservation measures (OECMs). Despite this, robust evaluations of the effectiveness of governance mechanisms that could act as OECMs in preventing forest loss and carbon emissions relative to Protected Areas (PAs) remain sparse. We assessed the impact of PAs and two potential OECMS: Indigenous Lands (ILs), and Non-Timber Forest products Concessions (NTCs) on forest loss and its associated carbon emissions in the Peruvian Amazon from 2000 to 2021. We also assessed two other governance mechanisms with a commercial extractive use, Logging (LCs) and Mining Concessions (MCs), as a point of contrast. We used statistical matching methods to account for the non-random spatial distribution of the governance mechanisms analysed and of deforestation risk. PAs were the most effective, having avoided 88% of the expected forest loss, followed by NTCs (64%) and ILs (44%), both with the potential to be classified as OECMs. LCs had a positive effect at reducing deforestation (29%) while MCs had a 24% increase in expected forest loss, showing that extractive governance mechanisms can have big differences in their impact to forest cover. The Kunming-Montreal Global Biodiversity Framework includes a target of 30% of land protected by 2030 and refers to OECMs as complementary to PAs. Our study provides robust evidence of long-term positive impacts of potential OECMs and other mechanisms at preventing forest loss and reducing carbon emission. This finding is key to more effectively achieve targets from the Kunming-Montreal Global Biodiversity Framework and the UN Framework Convention on Climate Change.

Primary FLARE Theme

Forests and trees in a just climate transition

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Faith-based organizations in forestry: a case study of modified taungya system in Goaso, Ghana

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Abstract

Amidst efforts to restore degraded forests in Ghana through participatory approaches like Modified Tuangya System (MTS), the potential of religious groups to effect social and ecological changes by motivating their members for a particular cause in this regard has rarely been explored. This study assessed the involvement of Christian religious groups in MTS in the Ayum Forest Reserve, Gaoso, Ghana. Purposive sampling approaches were used to obtain both qualitative and quantitative data from 56 MTS participants plus key informant interviews from the District Forest Services Division. We

identified that 3 churches were involved in MTS since 2019. Collectively, 610.7 ha of degraded portions of the Ayum Forest Reserve have been planted by the churches with variation in the area planted for Deeper Christian Life Ministry (0.09.94%), Church of Pentecost (24.56%) and St. John Paul II Parish (65.50%). Participation was largely hinged on the influence and interest of the church leaders, perceived benefit of MTS to the church and to the individual members. Participation by the churches contributed to the livelihoods of the members through access to land for food production and income through sales of farm produce. The challenges that hampered the implementation of this model of MTS included lack of proper documentation, disagreements over the formula for sharing of benefits between the church and members, change in the leadership of the church, and misinterpretation and or uncertainties in terms of its future financial benefits from harvested trees. Compared to other MTS schemes that directly engages members of fringe communities, our study highlights the potential to tap into the faith and believe in leadership of religious groups within communities to implement reforestation schemes if measures are put in place to mitigate the identified challenges. Since most of the MTS activities revolved around the leadership of the local churches and it is not recognized as "core activity" of the church, the sustainability of such a scheme would be in doubt when the leadership loose interest or get changed. Our study contributes to the body of knowledge on the challenges and opportunities in forest landscape restoration.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

29

Greater Flexibility in Payments for Ecosystem Services: Evidence from an RCT in the Amazon

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Abstract

Payments for Ecosystem Services (PES) offer a promising approach to forest conservation by aligning economic incentives with environmental goals. However, the rigidity of traditional PES contracts may not fully account for the dynamic opportunity costs faced by landowners, potentially undermining both participation and conservation outcomes. Our study introduces a novel PES model that incorporates flexibility by allowing partial payments even when deforestation occurs, provided it does not exceed specified thresholds. Conducted in the Brazilian Amazon, our randomized controlled trial (RCT) compares the effectiveness of traditional fixed-payment contracts with our flexible-payment model among voluntary landowner participants. Our findings reveal that while the flexible contract can save more forests at the aggregate level, the fixed-payment model demonstrated a higher benefit-cost

ratio, challenging the notion that greater flexibility necessarily leads to more sustainable outcomes. This research contributes to the broader discourse on optimizing PES designs to balance ecological integrity with economic feasibility, offering valuable insights for policymakers, conservationists, and scholars in the forests and livelihoods domain. By situating our results within the context of the Brazilian Amazon, we highlight the potential for innovative PES contracts to enhance forest conservation strategies under varying economic and environmental pressures.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

31

Farmer-Herder conflicts in the Sekyere Afram Plains District of Ghana: Frontiers at Play

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Abstract

Conflicts between cattle herders and crop farmers constitute a dominant type of natural resource conflicts in Ghana, the West African sub region and indeed the entire African continent. The conflicts have claimed thousands of human lives with some single instances of the clashes leading to more than 80 human deaths[1]. Agricultural production has been significantly affected though disruption of farming and herding activities, destruction of food crops by raiding cattle and killing of cattle by angry farmers and community people. Property has also been destroyed through arson and physical damage. In Ghana, the Sekyere Afram Plains District and Asante Akim North Municipal in the Ashanti Region, and parts Ghana's Eastern and Bono Regions have become the conflict hotspot areas. This paper demonstrates the role of 'Frontiers' in the farmer-herder clashes and argues that to address the escalating clashes, clear land access procedures and operational rules need to be instituted for both farming and cattle herding in the district. 'Frontiers', in this context, refer to situations where existing authorities, sovereignties, and hegemonies are being challenged by new enclosures, territorialization, and property regimes[2]. The paper is based on content analysis of qualitative data collected through interviews and focus group discussions with key informants in the Sekyere Afram Plains District, including the local government (District Assembly and community-level Unit Committees), traditional authorities, farmers and herders. The study forms part of a broader Danida-funded research project on farmer-herder conflicts in Ghana.

[1]Source: https://www.catholicnewsagency.com/news/38728/at-least-86-dead-in-clashes-between-farmers-herders-in-nigeria

[2] Source: Peluso, N. L., & Lund, C. (2011). New frontiers of land control: Introduction. *Journal of Peasant Studies*, *38*(4), 667-681.

Primary FLARE Theme

Forest conservation: commons and contestation

36

Forests, fires and war: A comparative study or pre- and post-war fire regimes and livelihoods in east Angola

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Abstract

This work is a pioneering interdisciplinary and multi-methods investigation of the links between forest fires and violent conflict. Geographies of war often overlap and have important impacts in reshaping natural landscapes, in some cases reaching remote and pristine areas. Yet environmental research related to warfare is limited and often not interdisciplinary, with a handful of studies focusing on the relationship between fire, war and forest. Integrating historical information gathered through interviews with elder members of local communities and satellite data analyses, we compare pre- and post-war fire regimes in Moxico, east Angola. This remote region is identified as the largest undisturbed miombo woodland in Africa and is also one of the areas most heavily and persistently affected by 27 years of civil war (1975-2002). In these highlands, the patchy configuration of the vegetation comprising flammable savannas intertwined with non-flammable forests, seem to be closely linked to fire regimes largely influenced by humans that adapt and change according to social circumstances, which might have important effects on the heterogeneity of the vegetation. Our qualitative and quantitative data point towards a decrease in fire frequency and intensity during the civil war (with a resulting perceived increase in woodland cover), followed by a steady increase after the peace agreement was signed in 2002. We identified possible reasons for this change linked to three main factors: 1. A shift from strict to weak fire governance alongside the loss of customary knowledge of fire use; 2. Drastic changes in subsistence activities linked to local livelihoods; and 3. Limited and geographically concentrated impact and use of fire in warfare. Although the ecology of the landscape is important in determining fire regimes, human dynamics and decisions over the land could have major impact on vegetation, ecosystem services and forest communities. This study highlights the importance of socio-political factors in shaping fire regimes alongside ecological ones. These aspects, we argue, deserve closer attention and are better served by transdisciplinary, multi-method approaches.

Primary FLARE Theme

Forest governance from local to global

Student Level

Ph.D.

37

Finding the dry dense forests of Africa: the central role of local knowledge in the process of classifying forest types in Southeast Angola

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Abstract

It has been claimed that the highlands of the Moxico province in southeast Angola contain the largest contiguous and relatively intact miombo woodland in Africa (NGOWP, 2017). Previous spatial analysis show vast extensions of somewhat homogeneous miombo, interspersed with savannas along watercourse margins. After conducting several interviews, focus groups, transect walks and participatory mapping methods with locals, our study lead us to consider that the characteristics of some of the vegetation formations in the area, such as response to fire, tree species composition and ground cover do not match with the description of miombo reported in scientific literature. Specifically, locals reported a vegetation formation ("dense woodlands") dominated by *Cryptosepalum spp.*, that is of high economic and cultural importance to them. The results of this work show that those dense woodlands might rather be representative of dense dry forests, currently reported endemic to West Lunga in Zambia, an area also known as the Zambezian dry evergreen forest dominated by *Cryptosepalum exfoliatum pseudotaxus* (WLCP, 2023). Meanwhile, east Angola remains classified as tropical savanna or miombo woodlands (White, 1983; WWF, 2006). With these insights, articulated with data obtained from ecological surveys of those forests, maps of these unique African evergreen dry forests can be updated to incorporate a more accurate description of vegetation types, including socio-cultural values and perceptions, uses and management.

This work highlights the value of giving voice to local communities in the process to understand a complex landscape (touched by war, colonization, migration, etc.) that has been classified and managed by them since ancient times; and it emphasizes the importance of integrating different types of knowledge in the process of building scientific knowledge. The outcomes of this study can be used by habitat managers in the region and by the broader scientific community to study, manage and conserve African dry forests through approaches that are inclusive and fair. In addition, we hope this work contributes in the safeguarding of local ecological knowledge, helps reinforce cultural indigenous identities and connections to their living place, and gives visibility to experiential spatialities.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

40

Nature-based solutions and ecosystems restoration initiatives in Africa: a review

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Abstract

Recognition of nature-based solutions (NbS) is on a growing trend worldwide. The solutions seek to restore, protect and, sustainably manage natural and modified ecosystems to optimize biodiversity and human wellbeing benefits. The present review summarises in the context of Africa the, nature-based solutions, current situation, drivers of ecosystem degradation, restoration strategies and, African Ecosystem Restoration initiatives, lessons learnt and way forward. In Africa, the deforestation rate is very high with about 420 million ha of forest converted to other land uses between 1990 and 2020. The Net emissions from land use, land-use change, and forestry were estimated at 4.1 $GtCO_2$/year between 2011 and 2020, representing about 10 percent of total anthropogenic CO_2 emissions. Land-use change has caused the emergence of more than 30 percent of new diseases since 1960. The most important drivers of ecosystem degradation are land degradation process, fragmentation, human activities and, climate changes. Native mixed-species plantations and natural regeneration are the most important restoration strategies developed on the continent to lower down the degradation processes. Some African Ecosystem Restoration initiatives have been undertaken on the African continent toward dense and mangrove forests (Benin, Ghana, Senegal), restoration of National Parks to get benefit from International Carbon Market (Benin, Cameroon), the regreening Africa Project (Ethiopia, Ghana, Kenya, Mali, Niger, Rwanda, Senegal and Somalia) and, the Africa's Great Green Wall programme to combat desertification in the Sahel region and hold back expansion of the Sahara, by planting a wall of trees stretching across the entire Sahel. Lessons learnt and way forward have been discussed in the paper to sustain the nature-based solutions initiatives on the African continent.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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From Tradition to Transformation: The Potential of Carbon Credits from Cultural Burning

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Abstract

Wildfires pose global challenges, negatively impacting the economy, community livelihoods reliant on forest resources, air quality with health implications, and contributing to greenhouse gas emissions fueling climate change. In Canada, severe wildfire events, in record years, represent 2 to 3 times more carbon emissions than all other sectors combined. This trend of severe wildfire events is attributed to the current reactive approach to wildfire management and climate change. However, not all wildfires are a source of problems as they are natural and can be healing. It is a severe kind of wildfire that needs to be avoided by shifting from a reactive to a proactive approach to wildfire management. Yunesit'in, an Indigenous community in central British Columbia, in Canada, is reviving an ancestral practice to address this problem. They started a cultural burning program in 2018 where they do controlled and low-severity burns to reduce surface forest fuel and reduce the likelihood of severe wildfire events. If we can understand and quantify this phenomenon, there may also be potential long-term carbon savings.

In my research, we are addressing the challenge of scalability of cultural burning by exploring the feasibility of generating carbon credits. We are observing the effect of cultural burning on wildfire behaviour and emissions using ground measurements and remote sensing. Working with Yunesit'in as a case study, we are using this data to drive models to predict wildfires of the future; where we compare a future with and without cultural burning and assess potential carbon emission reduction. If significant, revenues from selling carbon credits could sustain the cultural burning program, providing employment opportunities to a small and remote community. The framework we are developing may be used by other Indigenous communities in Canada that are interested in starting their own cultural burning program. This research aims to address the growing wildfire problem, especially for forest-dependent communities, by introducing economic incentives to be part of the solution.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Ph.D.

42

Sector Grabbing: Cotton, Bananas, Peanuts and Charcoal in Senegal

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Abstract

The rich and powerful do not have to own land. They own the markets. In each sector in Tambacounda, Eastern Senegal, a few powerful actors reap most of the profits. Peasants remain below subsistence. Most experience a hungry season every year. They go hungry with a good crop (as prices fall) and do the same with a poor crop (prices rise). The hunger is not a function of the weather. It is a matter of how each sector is embedded in a set of conditions (permits, quotas, licenses, credit arrangements, access to transport, access to markets, access to resources [i.e. trees for charcoal], etc.) that allow a few people to benefit while leaving everyone else behind. In Bananas, the issue is partly land ownership. In the other sectors it is not. Each case must be examined individually to see how capture takes place and is consolidated. Based on field research in Tambacounda, this paper will explore market grabbing or sector grabbing in these four domains and will propose a general theory of sector-grabbing.

Primary FLARE Theme

Human well-being, poverty and forests

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Understanding smallholder decision-making to diversify trees on farms: Enablers and barriers for nature-based solutions in Western Kenya

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Abstract

Developing innovative solutions for forest landscape restoration and sustainable agriculture is urgently required in response to the intertwined challenges of biodiversity loss, climate change, and human well-being.

This is particularly relevant in densely populated smallholder landscapes, where local communities often rely heavily on natural resources for their livelihoods and limited land is available for traditional conservation approaches such as creating protected areas or establishing large-scale forest reserves. In these shared landscapes, integrating diverse trees and shrubs into agricultural landscapes (agroforestry) has emerged as a critical nature-based solution. However, the success of such solutions hinges on understanding the factors that shape local communities' land management decisions.

We conducted surveys with 620 smallholder farmers in the Kakamega rainforest landscape in Western Kenya, employing the Theory of Planned Behaviour to investigate drivers behind their intentions to increase tree and shrub diversity on their farms. Our findings reveal that demographic factors, past experiences, and beliefs shape farmers' decisions regarding tree diversification.

Understanding the factors influencing farmers' decisions to integrate diverse trees and shrubs into agricultural landscapes has significant implications for sustainable development. By addressing identified

barriers and leveraging enablers, targeted interventions can be designed to promote sustainable tree diversification practices among smallholders, contributing to both local livelihoods and broader goals of biodiversity conservation and climate change mitigation.

The insights gained from our study may be applicable to other densely populated smallholder landscapes, where reimagining the relationship between forests, trees, and human well-being is crucial for sustainable development and biodiversity conservation. By exploring the factors influencing farmers' decisions to integrate trees into their farming systems, we contribute to this reimagining process and pave the way for enhanced local livelihoods and ecosystem resilience.

Primary FLARE Theme

Beyond the forest: trees and human well-being from farm to city

Student Level

Ph.D.

52

Can livelihoods support conservation? Community insights from India.

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Abstract

Forest dwelling communities in India have developed elaborate and time-tested governance models for their natural resources to support livelihood and sustenance needs. These governance models, however, have been challenged in modern times by changing government policies around conservation initiatives, recognition of land rights, and effects associated with India's economic development. Through extensive field work, I have had the opportunity to study governance models in several states such as Maharashtra, Madhya Pradesh, Rajasthan, and Karnataka. While some communities are able to continue their traditional management practices, in other cases communities are struggling to do so. My research is aimed at understanding how these external drivers, with a focus on implementation of policy, have affected governance models within these communities and the resulting ecological and social impacts.

A key change in government policy was the introduction of the Forest Rights Act (2006) that provided communities with the opportunity to secure rights over their traditional forests. Community Forest Resource Rights (CFR) enable the communities to protect, conserve, and restore their traditional forests (while also giving them rights to harvest Non-Timber Forest Produce). However, the implementation of the Act has been poor, as many states have recognized less than 5% of CFR rights.

I have applied Elinor Ostrom's design principles to analyze the effects of these policies on these governance models. One example is the absence of land rights that has led to undefined boundaries and overexploitation of resources. However, while these design principles do identify what is necessary for robust governance models, there is little research in how external agencies and changing political and market environments have affected them. Understanding in what ways government policy can either challenge or bolster these governance models will help us understand what interventions could support India's forest dwelling communities. The evidence is clear that robust governance models have the potential to support conservation initiatives along with supporting livelihoods. To be successful, it is necessary to understand the complex relationship between acknowledging rights, fostering collaboration and transferring power to the grassroots level (Gram Sabha) and how that can then support community-led conservation initiatives.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

55

Redesigning Payments for Ecosystem Services (PES) to increase cost-effectiveness: a randomized trial in Mexico

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Abstract

Payments for ecosystem services (PES) mushroomed globally since the 1990s as key incentive-based instruments for sustainable natural resource management. PES provide cash or in-kind payments to landholders or communities that are conditional on specific activities, such as forest protection, which should result in enhanced ecosystem service provision. PES implementation in tropical settings aims to curb deforestation by shifting local incentives towards conservation, which can yield climate, biodiversity, and livelihood benefits simultaneously. Although PES effectiveness has received significant scholarly attention, whether design and implementation innovations can improve program environmental and socioeconomic outcomes remains poorly tested in the field. We present findings from a randomized trial in Selva Lacandona (Chiapas in Mexico) –a country with some of the world's largest, longer lasting and most researched PES initiatives– that tested whether a PES contract that requires enrollees to enroll all of their forest is more effective than the traditional PES contract that allows them to exercise choice in land selection. The modification's aim is to prevent landowners from enrolling only land parcels they planned to conserve anyway while leaving aside other parcels to

deforest. This field study –which provided direct economic incentives for ~900 forest hectares in a one-year intervention that was co-developed by a team of researchers, practitioners, and policy-makers– shows that the full-enrollment treatment significantly reduces deforestation compared to the traditional contract, quadrupling the original program's cost effectiveness. This extra conservation occurs despite the full-enrollment provision reducing the compliance rate due to its more stringent requirements, although we document no negative socioeconomic effects and a high rate of program satisfaction among participants. Our study highlights how simple and locally informed innovations in policy design can greatly enhance the efficacy of conservation payments, which is much needed as large public PES schemes in countries like Mexico, Ecuador, and China are undergoing downsizing or discontinuation. As tropical forests continue to face severe pressures, our study also highlights how imagining new ways to build research collaborations and develop policy interventions can yield improved outcomes for both forests and the people who enjoy and depend on them for their well-being.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

60

'Greenlash' and reactionary stakeholders in environmental governance: An analysis of soy farmers against zero deforestation in Brazil

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Abstract

The rapid disappearance of tropical forests has led to increased adoption of sustainability commitments. However, implementing zero-deforestation commitments faces numerous challenges, such as resistance from beneficiaries of the status quo in agricultural commodity-exporting countries. This study focuses on soy farmers in Tocantins, a Brazilian state in the Cerrado ecoregion with high soy-driven deforestation rates. Drawing from a review of the land-use change literature in Brazil and background interviews with soy farmers in Tocantins, we ran a focus group with seven of them selected through snowball sampling to appraise three scenarios of increased restrictions on agricultural land-use expansion. They are: (1) access to a productivity-increasing technology conditioned to refraining from opening new farms in areas with native vegetation; (2) a hardened European policy limiting imports to conversion-free soy regardless of the ecosystem; and (3) a strengthening of Brazil's own environmental policy, increasing the amount of land farmers are to set aside for conservation. Our findings show Brazilian soy farmers are highly skeptical of environmental regulations and suspicious of foreign actors. While rallying for greater autonomy, they rejected attempts to rein in their (agri)business-as-usual practices and dismissed such policy efforts as ultimately driven by hidden agendas – showing a strong inclination to resort to conspiracy theories, understood as alternative explanations that attribute events

to scheming by powerful actors. A frontier mindset, underscored by libertarian values, coupled with distrust in state institutions or in the motives of foreign regulators thus create an obstructive, reactionary stance in the face of zero-deforestation efforts in Brazil.

Primary FLARE Theme

Forest governance from local to global

Student Level

Ph.D.

61

Allocating climate and biodiversity funding: Do funders prioritize countries vulnerable to climate change and biodiversity loss?

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Abstract

Climate change disproportionately affects people and their livelihoods in low- and middle-income countries (LMICs). At the same time, LMICs are home to a large portion of the world's biodiversity, which is increasingly under threat. The interconnected climate and biodiversity crises require immediate and effective action. Such action will require substantial amounts of funding to adapt to climate change and stop biodiversity decline. Given the acute need and scarce financial resources in LMICs, international funding will have to be a major source of support for climate and conservation action. Yet knowledge of international funding for these two goals remains fragmented, with little systematic analysis across them over time. Here, we address this gap by analyzing OECD-DAC data on climate adaptation and biodiversity investments over the period 2013-2022. Using two-stage Craig regression models, we assess whether funding is prioritized to countries with the greatest need and compare donor use of grant-based and return-based instruments. Results indicate that funders take vulnerability to climate change and biodiversity loss into account when making investment decisions. Funders using grant instruments are more likely to provide funding to countries that are more vulnerable to climate change and to countries where biodiversity is under current or perceived future threat. For return-based funding, on the other hand, we find the opposite relationship: funding is less likely to be invested in countries that are more vulnerable to climate change or more exposed to biodiversity threats. Total invested amounts are also lower compared to countries where the need for investment is lower. Our integrated assessment of the climate and biodiversity finance landscape and comparison of different types of instruments make a distinctive contribution to existing scholarship. Our findings also have important implications for policy and investment practices to achieve more just and effective allocation of the limited and insufficient amounts of climate adaptation and biodiversity funding. Results highlight the importance of grant-based funding to reach countries in highest need of adaptation and biodiversity action. They also show that private investments using return-based instruments do often not end up where they are needed most. Improved allocation of return-based instruments is therefore needed.

62

Mapping local stakeholders' perspectives on landscape values in restored areas of Western Rwanda

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Abstract

Introduction: Forest landscape restoration is increasingly considered as reflecting values and providing goods and services that people value. These values shape our understanding of landscape restoration outcomes and need to be incorporated into future decision-making on restoration strategies. Rwanda has emerged as a global restoration leader - by pledging and implementing the Bonn challenge. Yet, the country's restoration progress has primarily been assessed with biophysical approaches. Missing, is grounded information on local stakeholders' perceptions of landscape values, where restoration has been implemented.

Objective: The two-fold objective of our study is i) to appraise variations across different stakeholder groups, regarding their identification and mapping of landscape values, and ii) to link these values to the characteristics of restoration landscapes in western Rwanda.

Methods: Using participatory mapping (PPGIS), we will capture a wide range of landscape values, elicited during focus group discussions with key informants from four districts of Western Rwanda. The most pertinent values will then be mapped during individual interviews with local stakeholders, using a spatially-explicit online survey and the Maptionnaire software. Respondents' socio-demographic characteristics, (e.g., gender, occupation, education, age) will be considered to ensure a fair representation of all stakeholders. Focus will rest on selected values, for instance, intrinsic (indigenous species), instrumental (erosion control), or relational (memories) values, linked to the restoration of social-ecological systems in Rwanda.

Contribution: Cross-site analyses to compare and contrast the identified landscape values can help to identify high-priority areas for restoration, and to shed-light on different types of restoration needed in the region. Stakeholders' perspectives on landscape values likely differ based on their socio-demographic background, and unique characteristics of the restoration landscape that they inhabit.

Socio-cultural valuation techniques are an inclusive approach to appraise such divergences and to inform the resolution of conflicts that can occur in the context of nature management and restoration.

IPBES and thematically adjacent scholars increasingly highlight the importance of including diverse values in decision-making processes and call on governments to more effectively integrate local stakeholders' perspectives in efforts to comprehensively appraise and equitably govern future restoration initiatives.

Keywords: Forest Landscape Restoration, Plural Values, Participatory Mapping (PPGIS), Social-Ecological Systems, Western Rwanda

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

66

Savior or Silent Threat? Preliminary Investigations into Eucalyptus in the Green Transition

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Abstract

As one of the world's fastest-growing trees, requiring little care and less water, eucalyptus has been long utilized as an easy and obvious solution to various environmental and livelihood problems. From tobacco companies pushing it as a solution to the deforestation caused by their own crop in the 1950s, to eucalyptus plantations entering the Kyoto Protocol as effective carbon sinks in the 1990s, a tree that evolved only for life in Australia has spread around the world as a silent partner to the green transition. Here I present preliminary investigations into the known and potential future threats to ecosystems, water tables, and local livelihoods around the world posed by this tree, using examples from central Sierra Leone and Southern Nepal. I argue that the tree's "arrogance"—its ability to drain available water, to destroy soil biomes and other plant life through the toxic oil in its leaves, and its susceptibility to fire—pose a silent threat to local life around the world, a threat that is generally only seen and fought by local people. From the Mapuche in Chile being labeled "terrorists" by their government for fighting eucalyptus plantations, to *indigenos* in the *Matto Atlantico* of Brazil losing their land, water, and culture to a paper and pulp conglomerate, this preliminary investigation invites us to look more closely at the dangers posed by exotic tree species that are current handmaidens to the green transition.

Primary FLARE Theme

67

Climate Change Education for social transformation: empowering communities through climate action learning

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Abstract

Climate change education plays a crucial role in empowering individuals and communities to tackle the challenges of a changing climate and drive social transformation. This is the context of our research that investigates the impact of climate change education on resilience and sustainability within the forests and livelihoods domain. We developed this study in a Brazilian school located in a poor neighborhood of Sao Paulo. These students are part of the Brincadas Project created by LACE (Language in Activities in School Contexts Research Group) in order to develop multimodal repertoires to investigate, describe, analyze, prepare, implement, reflect, propose, and evaluate ways of acting to overcome adversities that have made situations of social vulnerability catastrophic.

Drawing on real-life contexts and experiences, our study demonstrates how climate change education empowers marginalized communities to adapt to climate change and advocate for sustainable forest management practices. Through participatory approaches and community engagement, we highlight the role of education in enhancing local capacity and agency, leading to more equitable and resilient livelihoods.

Our study employs a participatory research methodology, involving stakeholders from diverse backgrounds, to explore the transformative potential of climate change education. Our findings underscore the scholarly significance of integrating education into natural resource management strategies, emphasizing its ability to address social injustices and promote environmental sustainability.

Practically, our findings emphasize the importance of prioritizing climate change education in policy and practice to build resilience and promote social equity. By empowering individuals with knowledge and skills, education not only enhances adaptation and mitigation efforts but also fosters social cohesion and collective action.

In the broader context of natural resource management and sustainable development, our study contributes to a deeper understanding of the linkages between education, climate change, and social transformation. By highlighting the practical applications of climate change education, our findings offer valuable insights for policymakers, practitioners, and grassroots organizations working to address the complex challenges of climate change within the forests and livelihoods domain.

Primary FLARE Theme

Teaching and learning on forest livelihoods

70

The long-term effects of conservation efforts in Mozambique: Evidence from big-push conservation and development initiatives

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Abstract

Environmental degradation is a global challenge necessitating innovative policies to balance nature conservation with human development. Biodiversity loss and the decline in ecosystem services over recent decades raise significant concerns for human well-being. This study assesses the long-term impacts of a terminated combined asset-building and forest conservation Payment for Ecosystem Services (PES) program in Mozambique – the Sofala Carbon Community Project (SCCP), operational from 2005 to 2014. Drawing on remote sensing data and household surveys, we assess the SCCP's impact on forest cover and human well-being, seven years post-project. Our findings indicate a substantial decline in forest cover in the study area from 1996 to 2019, with a 20-percentage point slower reduction in forest cover five years post-project in the project's pilot area. However, sustained effects are absent in the project expansion area. Using a household survey conducted with recipients and non-recipients shows lasting increases in wealth and household incomes, in particular for those who signed private agroforestry contracts and were employed by the project. But, the project also led on average to higher household incomes and better perceived economic situation for participants that only benefitted from the REDD+ PES component. Furthermore, our study contributes to the literature on PES effectiveness by shedding light on the potential crowding-out of motivations. Our household surveys indicate that there is no evidence for motivational crowding-out, as SCCP participants are not less intrinsically motivated and tend to be even more motivated by external incentives to engage in conservation. In addition, the project seems to have strengthened participant's environmental agency, that is their beliefs that their actions can help to sustain the environment. Overall, these findings underscore the integrated approach's success, combining REDD+ strategies, agroforestry, and development components, in achieving lasting positive outcomes for both conservation and human well-being.

Primary FLARE Theme

Forest governance from local to global

72

Agroforestry and contract farming for sugar can have positive and negative impacts on livelihood resilience in Tanzania

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Abstract

African landscapes have become the focus of various agricultural interventions from public, private, and non-government entities promoting different agricultural and rural development models such as contract farming and agroforestry. Meanwhile, tropical smallholder agriculture, where smallholder farmers occupy 30% of agricultural land and produce 70% of regional food calories, is one of the most vulnerable sectors to climate change and is a priority area for promoting climate change adaptation measures. These interventions rapidly alter farming landscapes and how smallholder households build resilience to livelihood shocks. We contribute to the empirical literature on the influence of agroforestry and contract farming in building livelihood resilience to climate change and how these strategies interact in rapidly transforming landscapes.

We collected data from the Kilombero Valley, Tanzania, to examine the livelihood resilience co-benefits and trade-offs of sugarcane contract farming and agroforestry for smallholder farmers. We use a systems approach, using structural equation modelling and qualitative analysis on data collected in household surveys, interviews, and tree inventories in homegardens. Our study shows that homegarden agroforestry and contract farming can positively and negatively affect livelihood resilience, but both aid households in diversifying their livelihoods to build resilience. Quantitatively, we found that the number of farming plots owned drove livelihood resilience, building redundancy into the agricultural system. We demonstrate how contract farming has altered spatial land and cropping patterns, impacting how farmers build household livelihood resilience as they have cleared trees from their farm plots for sugarcane, leading to a concentration of farmers' trees within homegardens.

We demonstrate that homegardens may be important for ensuring the direct benefits of trees for smallholders and can aid diversification as landscapes transform under agricultural growth corridors and contract farming schemes. However, as farmers bear all production risks for sugarcane contract farming and become more reliant on buying food as the weather becomes increasingly unpredictable, this may negatively impact livelihood resilience and future food security. Understanding the nature of resilient livelihoods within the landscape will contribute to a more equitable transformation of smallholder systems as they adapt to climate change.

Primary FLARE Theme

Forests and trees in a just climate transition

Student Level

Ph.D.

74

Governance Innovations for forest ecosystem service provision – Insights from an EU-wide survey

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Abstract

In this talk we analyse the occurrence of governance innovations for forest ecosystem service (FES) provision in the forestry sector in Europe and the factors that influence innovation development. Based on a European-wide online survey, public and private forest owners and managers representing different property sizes indicate what type of governance innovation activities they engage in, and why. To investigate forestry innovations as systems, the analysis focuses on biophysical, social and technical factors influencing innovation development.

Our results show that most innovation activities are largely oriented towards biomass production. Accordingly, most forest owners implement efficiency-driven optimisation strategies for forest management and technological improvement for provisioning service supply, to generate income. In contrast, the provision of regulating and cultural services is not yet a prominent part of forestry innovation activities. Reasons are rooted in a market-oriented economic rationale focusing on timber production, which is related to a lack of financial resources to compensate for other FES provision or institutions to provide backup and security to forest owners and managers for engaging in innovation development outside wood production. If other FES beyond timber provision shall be provided, new forms of communication, cooperation and financing are needed.

Given that the provision of a wide range of FES is a politically well-established objective for forest management in Europe, a strategy is needed that helps to align actors and sectors for supporting related forest management approaches and business models. The current revision of the forest related policy framework on EU level under the EU Green deal poses a window of opportunity for better fostering novel governance approaches for more sustainable FES provision.

Primary FLARE Theme

75

Human Rights and Environmental Due diligence for deforestation-free supply chains? Exploring the Challenges for an Initial Implementation Period in the Cocoa and Coffee Sectors of Peru of the EU Deforestation Free-Products Regulation

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Abstract

The EU Regulation on Deforestation Free-Products (EUDR) aims to minimise the contribution of the EU to global deforestation and forest degradation, but the implementation of such regulation, including due diligence provisions as market requirements, faces significant challenges.

The study is based on data collection and a document analysis with semi-structured interviews, including a review of legal and scientific literature. We explore the initial implementation process of the EUDR through a case study in the cocoa and coffee sectors of Peru. Since Peru exports most of its cocoa and coffee volume to the EU and includes many smallholder farming families and indigenous communities, the impacts of the EUDR in Peru may be significant.

Our results show that this ongoing process involves complex challenges related to legality and due diligence statement, geolocation of plots, implementation costs, and country risk benchmarking. It may also contribute to systemic changes in production practices.

Due diligence as a continuous process in assessing human rights and environmental issues is needed to complement the EUDR in addressing the risk of companies abandoning production areas with weak governance; and building a long term multistakeholder approach; and providing incentives to smallholders through agroforestry systems and carbon certifications.

More generally, this case study contributes to the timely debate on the EUDR and other due diligence regulations by showing that the EUDR implementation process needs to ensure its enforcement at the local level in producer countries to enable its objectives and to strengthen international forest governance.

Primary FLARE Theme

Forest governance from local to global

77

Burdensome yet attractive: An assessment of motivations of community members to participate in formal community forest programs in Prey Lang Extended Landscape, Cambodia

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Abstract

Formalization of local communities' engagement in forestry through community forest management (CFM) programs has become a global trend in recent decades. Despite criticisms regarding the high costs and burdens associated with these programs, local community participation remains robust in many instances. However, there exists a significant knowledge gap, particularly in regions like Southeast Asia, regarding the underlying motivations driving participation in these formal programs.

This study employs self-determination theory and a mixed-method approach to understand the motivations of community members to participate in CFM in the Prey Lang Extended Landscape. The landscape covers Kampong Thom, Kratie, Preah Vihear and Strung Treng provinces in northeastern Cambodia. The research hypothesizes that factors such as perceived value of forests, forest dependency for livelihoods, spiritual and customary connections, expectations of greater future benefits of CFM, and low opportunity costs of participation play pivotal roles. Additionally, it anticipates that socio-economic attributes differentiate households opting to participate and those abstaining from CFM.

To examine these hypotheses, data will be collected between April and August 2024 from community members across eight CFM sites of varying forest conditions and outcomes, alongside national CFM stakeholders including CF network members, government officials, and civil society experts. The study will utilize Q-methodology (43 Q-samples and 48 P-sets), key informant interviews (30), and focus group discussions (16) to explore sources of motivation and demotivation among local community members, as well as socio-economic, environmental, and institutional factors influencing their motivations within CFM.

Understanding the motivations for community members to participate in CFM and how that is changing is important to enhance collective actions. The research does so by providing feedback to policies that shape local communities' interaction with their forests in the formal CFM context in Cambodia.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

Joint environmental and social benefits from diversified agriculture

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Abstract

Agricultural simplification continues to expand at the expense of more diverse forms of agriculture. This simplification in the form of, for example, intensively-managed monocultures, poses a risk to keeping the world within safe and just Earth system boundaries. To address these challenges, a new paradigm for farming systems is needed that focuses on providing food security and nutrition while minimizing negative environmental, health, and social impacts. Here, we estimate how agricultural diversification simultaneously affects social (human well-being, yields, food security) and environmental (biodiversity, ecosystem services, reduced environmental externalities) outcomes. We focus our assessment on five types of diversification strategies: i) livestock inclusion and diversification (including managed mammals, fowl, bees, and fish), ii) temporal crop diversification (e.g., crop rotation, cover crops), iii) soil conservation and fertility management (e.g., compost application), iv) non-crop plantings (e.g., trees on farms), and v) water conservation (e.g., contour farming).

Drawing from 24 studies in 11 countries across 2,655 farms, we show that applying multiple diversification strategies creates more positive outcomes than individual management strategies alone. Specifically, we show that combining multiple diversification strategies had overwhelmingly strong benefits across outcomes with positive effects especially on biodiversity and food security. Positive effects of diversification strategies on biodiversity were driven by effects on large farms, whereas positive effects on food security were driven by effects on small farms. Livestock diversification and soil conservation were the two strategies that appeared to consistently elicit multiple positive outcomes, especially win-win outcomes of biodiversity and multiple social outcomes. To realize these benefits, well-designed policies are needed to incentivize adoption of multiple diversification strategies in unison.

Primary FLARE Theme

Human well-being, poverty and forests

Wealth and income generation in the forestry sectors in Minas Gerais, Brazil

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Abstract

Globally, Brazil is one of the most important producers of wood products from forest plantations. The area devoted to forest plantations in Brazil is rapidly increasing, driven by climatic conditions suitable for high productivity, land availability, and strong market demand. Since most of the harvest is exported, wood production brings important macroeconomic benefits. However, knowledge of the economic impacts of forest plantations at regional and local levels remains limited. This study investigates this issue by analyzing the economic impacts of tree plantations across Minas Gerais, the state with the largest plantation area in Brazil established since 1980. This study focuses on the main forestry sectors – forest plantations, wood products, furniture, and pulp and paper – and how they interact with other main economic sectors to generate wealth for different income classes from both production and consumption. I employ a multi-regional input-output model with a Miyazawa extended framework covering 7 regions, 16 sectors, and 5 income classes. This is a novel approach for sub-state forestry sectors in Brazil. Results show that forestry sectors are important for income generation in the state, especially for lower income classes. More industrialized regions receive income from either an increase in production or in consumption; the resulting income is concentrated in the top income class. Although the impact of income generation through forest plantation expansion is small, most of it remains in the same region in which the plantation is located and principally accrues to lower income classes. These results are consistent with previous findings linking forest expansion to more income for the lower income classes (Afonso, R. and Miller, D.C. *Forest Policy and Economics 133 (2021): 102618*). Conversely, the cellulose and paper sector pays higher salaries, but most of the wealth leaks to other regions inside Brazil and out. These findings help provide a foundation for policies that promote the forestry industry for fostering economic growth in remote and less developed areas, policies that address rural poverty and shed light on understanding Brazil's forestry sectors.

Primary FLARE Theme

Human well-being, poverty and forests

81

Biocultural Mapping as a Tool for Generating Visibility of Pastoralist Conservation in Kenya's Northern Rangelands

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Abstract

As the biodiversity crisis deepens, the roles of Indigenous peoples and local communities are increasingly recognised and valued by global conservation actors. However, conventional forms of mapping have historically overlooked or misrepresented the presence of Indigenous peoples and local communities in their own lands and forests. In the rangelands of northern Kenya, the endurance of colonial-era land divisions and accompanying narratives about pastoralism have led to the misrepresentation of rangelands and dryland forest as (historically) empty *of* or damaged *by* people. As a result, pastoral rangelands have often been brushed aside by state officials as unproductive or degraded, and these narratives are drawn upon to justify the exclusion of pastoralists and their livestock from land designated, for example, for conservation-based tourism (Galaty, 2013; Homewood et al., 2019). Drawing on research done alongside the Inclusive Conservation Initiative in Kenya, this paper explores the application of biocultural mapping as a tool for evidencing pastoralist communities' historical occupation and conservation of the northern rangelands. Biocultural mapping is a creative participatory tool that communities can use to document their biocultural heritage and resource management practices, such as the how the recognition of sacred hills and specific sacred trees has helped to conserve areas of highland forest. We discuss the challenges and opportunities encountered and make recommendations based on these pilot mapping exercises. By documenting how communities have historically used, shaped, and conserved their environments, biocultural mapping could have potential as an advocacy tool for securing land tenure and user rights for pastoralists as stewards of global biodiversity.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

82

Participatory mapping of mangrove degradation and restoration in the Sundarbans of Bangladesh

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Abstract

Mangrove forest degradation continues in the tropical and subtropical coastal areas, driven by anthropogenic activities such as conversion to aquaculture and agriculture, urbanization. Increasing population, water pollution, and rising sea levels associated with climate change put enormous pressure on the Sundarbans mangrove ecosystems (SMEs) in Bangladesh. The protection and restoration of the Sundarbans mangroves is important to maintain social-ecological benefits (recreation, spiritual, support to livelihood through fishing) for millions of

people and the ecosystem functioning in this critically vulnerable coastal region. Yet, interventions to reverse their degradation through restoration at the local level are hampered by gaps in knowledge that local communities' involvement in research could help to address. Our study used this potential to examine degradation processes and opportunities for social-ecological restoration in the SMEs in Bangladesh. We applied the driver, pressure, state, impact, response (DPSIR) framework together with a Public Participation GIS (PPGIS) approach of 250 local respondents, to explore their spatial understanding of mangrove degradation and restoration dynamics. We show that drivers (climate change, population growth, infrastructure development) and associated pressures (river erosion, mangrove loss, land conversion) cause mangrove degradation in the Sundarbans. We identified different states (mangrove destruction, natural regeneration, single species, wild animal, and habitat quality) caused by degradation and their effects on different ecosystem services (fish production, honey production, tourism, health and wellbeing). In response to ecosystem restoration, the community perceived five important responses (community-based plantation, forest department-organized plantation, seasonal resource harvesting ban, strong patrolling, habitat management). Finally, our respondents identified spatial locations for each of the drivers, pressures, states, impacts and responses in Sundarbans mangroves, which helped to find options for minimizing degradation. Our study provides a place-specific and system-level understanding of ecosystem degradation processes and pinpoints tailored opportunities for social-ecological restoration in the Bangladeshi Sundarbans. Integrated research approaches such as our novel combination of PPGIS with the DPSIR framework can inform forest policy-making, and could be adopted by ecosystem managers in Bangladesh and elsewhere in the tropics to spatially appraise mangrove degradation drivers, promote locally-led restoration approaches, and identify socially acceptable modes to conserve, restore and manage mangroves for the future.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

83

Forests, Roads, and Streams: Assessing the Factors Influencing Private Forest Road Crossing Management in the Lake Champlain Basin, Vermont, USA

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Abstract

The Lake Champlain Basin is 66% forested, with around 80% of that land held in private ownership - making private forest landowners a critical stakeholder group for conservation and management of the watershed. Much of this private, forested land contains private roads and road crossings (such as culverts or bridges) that can impact water quality or prevent aquatic organism passage (AOP), but are critical to the livelihoods of those in the timber industry, maple sugarers, and other forest owners. Work is needed to understand how private forest road management in the basin is impacting stream systems, how landowner perspectives influence their road management decisions, and to assess landowner knowledge of road crossing best management practices (BMPs). The purpose of this study is to better understand the attitudes of road crossing owners towards their crossings and how they should be managed, and to recommend strategies for project planning, outreach, and education of crossing owners based on the implications of these findings. To achieve this goal, we utilized a mixed methods approach, in which surveys designed using the Theory of Planned Behavior (TPB) as a theoretical framework were mailed to over 1,300 forest landowners in the Ausable River (New York), Lamoille River (Vermont), and Missisquoi River (Vermont) watersheds of the Lake Champlain basin. Semi-structured follow-up interviews were also conducted with a subset of landowners. Our findings revealed that Vermont landowners differed from New York landowners in terms of how certain landowner characteristics – such as general concern for water quality, management type, parcel size, and age – relate to TPB concepts and perspectives on road crossing management. Additionally, these findings demonstrated that certain aspects of TPB survey design (namely, the assessment of perceived norms) should be modified to better address which TPB concept most influences forest road BMPs. We recommend specific strategies for targeted outreach and education about private road crossing BMPs to outreach professionals that may improve BMP adoption rates in the Lake Champlain basin and beyond. Most importantly, this study has implications for how to best balance conservation and climate resilience with human well-being in the Lake Champlain Basin's rural forest communities.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

84

Hidden Contributions of Forest to Poverty Alleviation: The Effect of Forest Configuration on Multidimensional Poverty in Peru

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Abstract

For the past two decades, the role of forests in alleviating poverty has been at the centre of global conversations on sustainable development, biodiversity conservation, and climate change alleviation. So far, most research on forest-poverty dynamics has studied the effect of forest-related policies on monetary poverty, ecosystem services, agricultural productivity, and food security. These policies modify and shape forest landscapes; however, the effect of forest configuration on eradication and/or poverty alleviation remains unknown. Here, we aim to fill in this knowledge gap. We integrate a series of cross-sectional data on multidimensional poverty (MPI) with high-resolution forest data (forest cover, number of patches and mean patch area) for 3786 rural households in 1066 sampling clusters in Peru. Our analysis uses a quasi-experimental approach to compare sampling clusters with different forest configurations but with similar socioeconomic and biophysical characteristics. We assessed both the effect of the forest on multidimensional poverty and on individual MPI dimensions: health, education, and standard of living. We find that the effect of forest cover and forest configuration on poverty depends on the outcome. Forest cover and the number of forest patches have a positive effect on the overall MPI, namely, clusters with a higher percentage of forests will present greater deprivation. However, the same is not true when analysing the effect of the forest on individual MPI dimensions. Forest cover and the number of patches were positively associated with levels of deprivation in education and standard of living, but showed a negative relationship with levels of deprivation in health, specifically child nutrition. Thus, clusters with a larger amount of forest were linked to better levels of child nutrition. These results demonstrate the complexity of forest-poverty dynamics and highlight the need for a multidimensional approach, as current combined metrics and income-based poverty measures could mask important contributions of forests to human well-being.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

85

The Mitigating Effects of Drones on the Impact of Deforestation on Public Health: Evidence from Ghana

Adriana Molina Garzon[1], Karen Ortiz-Becerra[2], Aleksandr Michuda[3]

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Abstract

The increasing intensity of climate change related shocks have significant effects on human health such as disease incidence, the worsening of chronic health conditions and the spread of infections. There is robust evidence showing that deforestation is a fundamental driver of climate change and a contributing

factor for the emergence of serious diseases like Zika, dengue, chikungunya and yellow fever. The effects of environmental imbalances affecting human health fall disproportionately on the poor and vulnerable rural communities, who are already victims of the concentration of malaria and other vector-borne diseases. Health systems are the foundation for individual and community-level resilience when it comes to facing these environmental threats on health. A strong and effective health system that provides accessible, affordable and reliable health services, serves as a defense mechanism to help individuals face health risks coming from environmental factors. However, rural healthcare facilities are often located in areas of inaccessible terrains or unreliable transportation due to poor road infrastructure. Delivery drones have gained popularity as a new technology that could reduce supply bottlenecks to remote medical centers, by providing fast delivery to remote areas avoiding road congestion and reducing the risk of access impediments due to road blockages or accidents. In this paper we seek to assess the mitigating effect of drones on the effects of deforestation on health outcomes in rural communities in Ghana. We leverage the rollout of Zipline drones' distribution centers, exploiting the spatial variation of drone coverage in the country to deliver medical supplies in rural areas. We utilize national household survey data with GPS coordinates, deforestation data and the location of Zipline's distribution centers to compare served and unserved areas, before and after Zipline's drones were available as a mechanism to facilitate the provision of health services in rural areas.

Panel Coordinator: Molina-Garzon_Panel

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

86

The effectiveness of government and NGO efforts in curbing deforestation in the Colombian Amazon

Hugo Charoud[1], Esteve Corbera[1,2], Lina Moros[3], Sebastien Costedoat[4], Santiago Izquierdo-Tort[5], Sergio Villamayor-Tomás[1]

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Abstract

Deforestation in tropical countries is a global environmental problem driven by agriculture or cattle grazing activities, which are expected to support rural livelihoods while attending the global demand for commodity crops and meat. In recent years, governments and Non-Governmental Organisations (NGOs) have implemented incentive-based programs or project-based initiatives in deforestation frontiers under the assumption that incentives will contribute to deter deforestation without compromising local livelihoods. Analyses of the effectiveness of this type of initiatives when they operate in the same region

remain scarce, yet such analyses are important to understand the contribution of incentive-based conservation to the stabilisation of deforestation frontiers. In this article, we analyse two initiatives aimed at curbing deforestation in the department of Guaviare, Colombia: the government-led "Incentivo Forestal Amazónico" (IFA) which pays farmers to conserve the Amazon forests; and the NGO-driven "Caminemos-Territorios Sostenibles" project (CTS) which provides technical assistance for the development of sustainable land-use plans. Using a quasi-experimental counterfactual-based research design, we assess the impact of the initiatives' contracts on avoided deforestation. We show that both have avoided the deforestation of circa 1.440 hectares in the study region yet differ in their annualised impact on avoided forest loss (276 ha versus 376 ha). This is explained by the fact that while the IFA tends to target larger forest patches with lower deforestation risk across a vast region to set the foundations for the future development of forest conservation and management enterprises, the CTS targets smaller forest patches with higher deforestation risk at the agricultural frontier. In the light of these findings, we argue that the combination of monetary and in-kind incentives for conservation can play a complementary role in halting deforestation in Colombia's Amazon, and potentially in similar regions of tropical America, and we thus advocate for more sustained and upscaled efforts in sustainable land-use and forest conservation. We also recognise, however, that these initiatives will be unable to stop deforestation unless such upscaling is also accompanied by an exponential increase in funding that can counteract the benefits that local populations and other more powerful actors currently derive from unsustainable agriculture and cattle grazing.

Primary FLARE Theme

Forest governance from local to global

87

Conditions for an effective EU regulation on deforestation-free products (EUDR)

Johanna Coenen[1,2], Martin Persson[1], Malaika Yanou[1], Arild Angelsen[3], Mairon Bastos Lima[4], Ahmad Dermawan[3], Thomas Kastner[5], Paulina Asante[5]

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Abstract

The European Union (EU) has recently adopted the EU regulation on deforestation-free products (EUDR) to halt deforestation associated with EU agricultural and timber trade. However, the pathways through which the EUDR is expected to bring about its intended effects in different contexts are not well understood. We conduct an ex-ante theory-based evaluation to examine potential pathways how the EUDR affects deforestation. We outline the theory of change how the EUDR can lead to its intended impacts of reducing deforestation - in and beyond supply-chains for EU consumption - but also highlight risks of leakage effects that undermine its effectiveness. By drawing on existing evaluations of other supply chain regulations related to land-use, we identify conditions that affect the likelihood of achieving the intended outcomes of the regulation in different contexts. We present examples from

various commodity supply chains to exemplify that the effects of the EUDR will likely vary with, among others, the EU market share of the targeted commodities, the stickiness of supply chains, and the availability of incentives and alternative livelihoods of producers in risk of deforesting. Our study is relevant for future empirical research aiming to assess the impacts of EUDR on the ground. Additionally, our findings carry strong policy implications, emphasizing where complementary measures can be targeted to create conditions for an effective implementation of the EUDR. Overall, the case of the EUDR exemplifies how the EU employs mandatory human rights and environmental due diligence approaches to govern sustainability issues beyond its own borders.

Primary FLARE theme?

Forest governance from local to global

88

Livelihood resilience: Two decades of forest cover changes and livelihood's strategies in the MAP region

Renzo Giudice

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Abstract

Forest ecosystems support the livelihoods of millions of people, sustain critical global and local biological and biophysical processes, and store and sequester large amounts of carbon dioxide. Yet deforestation and forest degradation continue in many tropical regions. Understanding how forest loss affects people's livelihood strategies is therefore essential to understanding, quantifying, and communicating the value of standing forests and helping to halt their loss. We explored this question by interviewing a set of 66 rural households in the Brazilian state of Acre, located in the Amazon Basin, during June-July 2022. We used the Poverty Environment Network (PEN) questionnaire to elucidate their income levels and main sources of income, including forest, agricultural, and off-farm economic activities. The same group of families had previously been interviewed between 2006 and 2007 using the same PEN questionnaire. Approximately half of these households are located within a protected area, the Chico Mendes RESEX, while the other half are located outside the RESEX. A gradient of forest cover was identified at different scales (micro-catchment and farm) to form clusters to which each household was assigned. We used maps of forest cover loss from 2006 to 2022 to quantify changes in forest cover and relate these changes to changes in income levels and main sources of income reported by the interviewed households. Our intention is to test the hypothesis that households located in areas that have experienced the least forest cover change at the aggregated (microbasin) level during these years have been able to maintain their livelihood strategies compared to those located in areas with significantly more forest cover loss. We expect the mechanism behind this to be the provision of ecosystem services that healthy forests provide. Our small panel data provides an opportunity to show evidence that maintaining forests contributes to the resilience of socio-economic systems. We expect

that our results could be used by local authorities in designing and justifying forest conservation initiatives, such as landscape connectivity policies and payments for ecosystem services.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

90

Learning from local farming systems to tailor forest restoration initiatives by rural populations. An example in the Tshopo province, Democratic Republic of Congo

Adrien Peroches[1,2,3], Emilien Dubiez[3,4], Benjamin Bisimwa[5], Corentin Lucas[1], Guillaume Lescuyer[3,6]

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Abstract

Democratic Republic of Congo is the second country in the world in terms of area of forest lost, caused at 92.2% by smallholders. Forest restoration is an opportunity to reverse this trend and to improve local livelihoods. At the African scale, smallholdings represent around 60% of land with a restoration potential. However, field results of forest restoration initiatives are hardly monitored.

Since 2020, the PROFEAAC project has supported rural population of Yanonge area (Tshopo Province) to restore their forests. We carried out a diagnosis based on compared agriculture concepts and on socio-economic methods to understand the diversity of farming systems and their access to productive factors: land, work force and capital. Then, a participative process was implemented to support each volunteer farmer to plant trees, in relation to its farming system, and more particularly its land access. Four main species were chosen by planters: afrormosia (Pericopsis elata), lisongo (Ricinodendron heudelotii), avocado (Persea americana) and mandarin trees (Citrus spp.).

A first assessment of this initiative is done after a two-year monitoring of plantations, through (i) field measurement (planted areas, mortality rates) and (ii) socio-economics surveys with planters. Our study show significant differences in planters' choices (species type, area planted, location) and outcomes (mortality rates) according to farming system diversity.

These differences in the results of this restoration initiative between types of farming systems and their development trajectories show us the usefulness of an approach that first understands farming systems in order to propose plantation strategies adapted to farmers' objectives. The use of this type of methodology in future initiatives should improve the performance of forest restoration with smallholder farmers in Central Africa.

Our work is helping to improve forest restoration strategies with smallholders and then better identify opportunities to plant more trees while creating more value for farmers.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

92

Playful Pathways: Innovative Approaches to Addressing Environmental Challenges in Brazil

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SP, SP, SP, Brazil

Abstract

Brazil's forests face complex challenges rooted in agriculture, livestock, illegal logging, infrastructure, mining, land grabbing, gold mining, and urban expansion, resulting in biodiversity loss, soil degradation, altered climate patterns, increased greenhouse gas emissions, desertification, and water resource depletion. São Paulo's Atlantic Forest fragments encounter similar issues due to urban expansion and agricultural growth, causing forest fragmentation, invasive species threats, forest fires, and health-deteriorating pollution. This has led to significant biodiversity loss, heightened vulnerability to the greenhouse effect, disturbances in water resources, increased landslide risks, and an overall decline in the quality of life due to the loss of essential green spaces.

In response, a key strategy is the implementation of solutions with a strong emphasis on environmental education, incorporating play as a central element. This includes combating deforestation and illegal activities, rigorous enforcement, effective environmental policies, sustainable technology research, public awareness campaigns, advocacy for conscious consumption, support for sustainable forest management, and empowering communities while respecting their rights.

This session focuses on innovative tools for environmental education, highlighting the importance of play in diverse settings such as urban, rural, seaside, and forest areas. Emphasizing a collaborative approach, the session amplifies the voices of participants and communities, addressing ethical considerations in combating environmental and forest degradation. Activities involve collective immersion in reality, discussion of needs and objectives, reflection on possible actions, and planning and implementation of intervention projects, all infused with playful elements.

Additionally, the session explores the Brincadas Projeto with COLINA (Collectives of Investigation and Action), aiming to address vulnerabilities exacerbated by climate and environmental emergencies in São Paulo, Brazil, through a playful lens. Grounded in a decolonial perspective, the project challenges anthropocentric, capitalist, and colonial logics, utilizing play to empower marginalized communities and foster social transformation.

Preliminary findings underscore the project's pivotal role in empowering marginalized communities through playful and collaborative approaches, providing a unique avenue for addressing societal issues and promoting equity and sustainability within communities. The success of these initiatives highlights their potential impact on creating a more just, equitable, and ecologically sustainable society through the power of play.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

93

Global patterns of commodity-driven deforestation and associated carbon emissions

Chandrakant Singh, Martin Persson

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Abstract

Achieving global climate and biodiversity targets and ensuring future food security will require halting agriculture-driven deforestation. Accurate data on the commodities driving deforestation across time and space is crucial for informing development, implementation and evaluation of forest conservation policies, be it through territorial governance or supply-chain initiatives. However, such information is currently hampered by limited and heterogeneous data availability (in both comprehensiveness and scope), computational challenges, and lack of updates to the existing databases, that diminish their accuracy and relevance over time. To tackle these challenges, we introduce the Deforestation Driver and Carbon Emission (DeDuCE) model, a framework that merges remotely sensed datasets with comprehensive agricultural statistics to enhance the quantification of agriculture and forestry-driven deforestation globally.

Developed using Google Earth Engine and Python, DeDuCE is designed to integrate new and emerging datasets, ensuring the model remains efficient and relevant despite increasing data volumes. This approach also ensures adherence to FAIR data principles, emphasising replicability, adaptability and utility. DeDuCE reports over 9,100 unique country-commodity deforestation footprints across 176 countries and 184 commodities from 2001-2022, surpassing existing databases in scope and detail.

Overall, the DeDuCE model estimates that 132 million hectares (Mha) of forests where lost across the globe due to expanding croplands, pastures, and forest plantations from 2001 to 2022. However, the role of commodity-driven deforestation in total forest loss exhibits stark contrasts between tropical and non-tropical regions: 45% of the tree cover loss in tropical countries is attributed to expanding agricultural land and forest plantations, compared to just 10% in non-tropical counties. Moreover, our analysis indicates that 6% of global forest loss that is attributed to agriculture and forestry-driven deforestation did not result in any identifiable production, with the figures standing at 12% for tropical and 2% for non-tropical countries.

The data provided by the DeDuCE model can help support work by governments, companies, and financial institutions to improve deforestation and emissions accounting, risk assessments, and sustainability evaluations of investments.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

95

Economic Viability of Leasehold Forestry Restoration Programme in Nepal: A Benefit-Cost Analysis

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Abstract

In recent decades, Nepal's forest cover has increased significantly, primarily attributable to the community-based forest management approach. Although the Leasehold Forestry Programme (LFP) has been in place for three decades to reduce poverty, it is imperative to assess its effectiveness. This research comprehensively examined the cost-effectiveness of the LFP through a benefit–cost analysis, focusing on case studies from Nepal's Gorkha, Tanahun and Nawalpur districts in the Chitwan Annapurna Landscape. For this study, sixty-four user groups were selected from 921 leasehold forests, using a three-stage cluster sampling technique. A household-level questionnaire survey (n = 154 for control forest users and n = 320 for leasehold forest users) was conducted to ascertain the costs and benefits for the beneficiary households. We employed the benefit transfer approach for regulatory forest ecosystem services, except for the carbon benefit, which was determined through a field-based biomass survey. The results indicate that leasehold forests perform better economically and contribute to the enhancement of user livelihoods compared to control forests. Emphasizing the leasehold programme's goal of ensuring fair access to and distribution of resources, this study underscores the importance of tenure certainty as a crucial factor in attracting prospective tenants and offering security for funding land restoration projects. However, recent modifications to the leasehold forestry tenure limit may impact the programme's effectiveness in the future.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

98

FARC guerrilla ceasefire and drinking water quality in Colombia

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Abstract

The establishment of the ceasefire with the FARC guerrilla changed not just social and economic patterns, but also the use of natural resources such as water management at the national level in Colombia. The implementation of the ceasefire had multiple social, economic, and environmental consequences. First, the decrease of attacks affecting the environment (for example, attacks to pipelines and their affectations to rivers) caused a decrease in the contamination of the rivers. Second, it allowed a better institutional management of the water and sanitation public service. Third, the increase of more economic activity by private investors, due to an increase in security in old FARC-occupied territories; which at the same time, increased the deforestation in the country. In this paper we study whether the implementation of the ceasefire with the FARC changed the quality of drinking water in Colombia, and complement this analysis by evaluating which water chemical, physical, and microbiological factors explain the change. To evaluate this effect, we use a difference-in-difference methodology where the FARC guerrilla presence and their attacks act as dummy and continuous treatment variables, respectively. To better understand if the changes in water quality are the result of changes in better institutionality or are the result of new economic activity, we use information of institutional capacity and deforestation in our models. Our results show that water quality decreased after the ceasefire with the FARC due to greater economic activity affecting natural resources (including water and forest). Consequently, drinking water quality decreased more in rural areas (where new economic activity was established) than in urban areas.

Molina-Garzon_Panel

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

99

Save the neglected crop wild relatives of the genus Vigna (Savi) in Benin

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Moléculaire et d'Analyse des Génomes (LGMAG), Faculté des Sciences et Techniques, Université d'Abomey-Calavi, Abomey-Calavi, Benin

Abstract

Sustainable conservation of crop wild relatives is one of the pathways to securing global food security amid climate change threats to biodiversity. However, their conservation is partly limited by spatio-temporal distribution knowledge gaps mostly because they are not morphologically charismatic species to attract conservation attention. Therefore, to contribute to the conservation planning of crop wild relatives, this study was aimed at assessing the present-day distribution and forecasting the potential effect of climate change on the distribution of 15 *Vigna* crop wild relative taxa in Benin under two future climate change scenarios (RCP 4.5 and RCP 8.5) at the 2055-time horizon. MaxEnt model, species occurrence records, and a combination of climate- and soil-related variables were used. The model performed well, with the average AUC and TSS values being 0.957 and 0.774, respectively. Results from the model showed that (ii) about half of the total land area of Benin was potentially a suitable habitat for the studied species under the present climate; (ii) nearly one-third of the species may shift their potentially suitable habitat ranges northwards and about half of the species may lose their suitable habitats by 5 % to 40 % by 2055 due to climate change; and (iii) the existing protected area network in Benin was ineffective in conserving wild *Vigna* under both under the current and future climatic conditions, as it covered only about 10 % of the total potentially suitable habitat of the studied species. The study concludes that climate change will have both negative and positive effects on the habitat suitability distribution of *Vigna* crop wild relatives in Benin such that the use of the existing protected areas alone may not be the only best option to conserve the wild *Vigna* diversity. An integration of multiple *in situ* and *ex-situ* conservation approaches taking into account "other effective area-based conservation measures" is therefore required. This study provides a crucial step towards the development of sustainable conservation strategies for *Vigna* crop wild relatives in Benin and West Africa.

Primary FLARE Theme

Forests and trees in a just climate transition

101

Innovative Pathways in the Human Welfare and Forests Connection

Adriana Molina-Garzon[1], Aleksandr Michuda[2], Cauê Carrilho[3,4], Nathan Cook[1], Adriana Castillo-Castillo[5]

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Abstract

This panel examines the tension between environmental conservation and human welfare considering innovative ways of understanding how and to what degree do environmental changes affect the wellbeing of communities in rural areas, both positively and negatively. In the first paper, Carrilho, Naime, Molina-Garzon, Morsello and Chervier, assess the impact of an incentive-based REDD+ program in the state of Acre, Brazil on both conservation and livelihood improvement efforts, understanding that such win-win outcomes are rare, especially in the long-term. In the second paper, Molina-Garzon, Ortiz-Becerra and Michuda study the connection between human health and deforestation in rural areas of Ghana, evaluating the degree at which the strengthening of the health system through the use of delivery drones can mitigate the negative effect of deforestation on human health. The next two papers broaden our understanding of the role of military forces (both legal and ilegal) as a cause of environmental change affecting human wellbeing. Cook and Reed focus on militarized conservation enforcement in Central Africa and its effects on conservation and enforcement-related violence. Utilizing quantitative and qualitative evidence, the authors explore the realities on the ground that constrain the effectiveness of militarized campaigns for conservation efforts. Finally, Castillo-Castillo and El-Khattabi study the ceasefire process with the FARC guerilla in Colombia, with an emphasis on its effects on environmental damages, including deforestation trends and drinking water quality in rural areas. The authors explore the role of institutional capacity and productive economic activity affecting deforestation trends, as the key mechanisms to understand the effect of the ceasefire process on drinking water quality for rural communities.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

104

Bridging Scales and Sectors: A Multidimensional Approach to Assess IPLC Land Rights and Forest Restoration Policies in Mexico.

Mariana Hernández-Montilla[1,2], Johan Oldekop[1], Rose Pritchard[1], Timothy Foster[1]

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Abstract

Biodiversity conservation and forest restoration are global priorities, with commitments like the Bonn Challenge and Initiative 20x20 shaping national policies. In Mexico, which has one of the world's largest community forestry sectors, agrarian reform laws have provided a foundation for secure community access to forests, supporting local livelihoods. However, the alignment of these policies with Indigenous Peoples and Local Communities (IPLC) land rights remains understudied. This research examines land rights policies related to IPLCs in Mexico and compares them to the principles in recent international forest restoration frameworks, aiming to foster innovation in the realm of analysing forests and livelihoods policies. We propose a novel approach, framed within the Spatial Triad of physical, social, and mental dimensions, to understand the complex interactions between people, places, and ideas in the context of environmental governance and land use planning; and the three coordination dimensions

(vertical, horizontal, cross-sectoral), to assess the coherence of IPLC rights and restoration policies across scales and sectors. The physical space encompasses the biophysical aspects of landscapes, the social space focuses on relations, power dynamics, and governance arrangements, and the mental space refers to ideas, knowledge systems, and cultural values informing how actors understand and relate to the environment and restoration. Additionally, vertical coordination analyses coherence between national IPLC rights policies and subnational restoration plans, horizontal coordination assesses coordination among agencies, and cross-sectoral coordination reviews the integration of IPLC priorities into multilevel restoration projects or agencies. The innovative multidimensional approach presented in this study offers a groundbreaking framework for analyzing the complex interplay between IPLC rights, forest restoration policies, and sustainable livelihoods. The findings emphasize the critical importance of integrating IPLC perspectives and knowledge systems into policy design and implementation processes, fostering innovative solutions that support both ecological restoration and community well-being. As Mexico consolidates its restoration vision, this research generates valuable insights on the multidimensional impacts of policies on IPLC-conservation relationships, contributing to overcoming obstacles and leveraging opportunities for inclusive and equitable restoration approaches. Harmonizing policies, generating cross-sectoral dialogue, and assessing knowledge gaps are crucial steps in achieving ambitious restoration commitments while supporting local communities.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Ph.D.

107

Rooted in perception: Household preferences for timber species in northeastern Madagascar

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Abstract

Natural resources, like thatch and timber, are used in housing but are becoming increasingly scarce with global landscape change. Sub-Saharan Africa contains the most severe need for housing improvements globally, as the majority of its population – which is set to double in size by 2050 – already lives in inadequate housing. Comprehensive research on natural housing materials, and on rural housing concerns in general, is lacking despite their critical importance for ensuring housing security, devising forest management strategies, and supporting human livelihoods long-term. Understanding rural housing concerns is particularly important for Madagascar, an island nation experiencing increasingly

severe weather events that frequently damage people's homes. We conducted semi-structured surveys of 100% of residents in a community living near Madagascar's largest remaining contiguous forest to understand rural housing challenges from a local perspective and to evaluate what drives natural housing material use at the species-level. We used structural equation models to examine how the characteristics of 92 timber species affected their use in housing. We found that the availability and the user-perceived durability and insect-resistance of a timber species significantly increased its use (all: $p < 0.001$). There was no significant difference, however, between empiric measures of hardness, density, or insect-resistance between timber species used in housing and those not selected (all: $p > 0.05$). Our finding that user preferences, rather than empiric differences between timber species, drove timber use has important implications for the management of accessed natural resources. User preferences must be central to housing policy recommendations to either ensure the continued availability of natural resources or suggest alternatives to natural resource use. We recommend further, innovative research on critical uses of natural resources that take user preference for materials into account.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

111

From conflict to collaboration through inclusive landscape governance: Evidence from a contested landscape in Ghana

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Abstract

The Western Wildlife Corridor (WWC) in Ghana's Northern Savannah ecological zone is a contested landscape where efforts to reverse widespread environmental degradation often conflict with local livelihood concerns and broader development objectives. Despite recent policy measures to devolve natural resource decision-making authority, poor environmental management, persistent socioeconomic challenges, and increasingly limited livelihood opportunities for people living within the corridor prevail. In this study, we investigate natural resource management and associated environmental degradation in the WWC using information on stakeholder perceptions of the current governance system from stakeholder workshops, focus group discussions, and key informant interviews.

We also explore how natural resource management might be strengthened to better deliver social, economic, and environmental goals in the WWC. We found that despite a history of contestation, stakeholders were able to agree upon specific issues of common concern and generate a collaborative vision for the WWC landscape. Transitioning toward such a vision requires significant investment in strengthening current governance structures and building natural resource management capacity within the corridor and beyond. Furthermore, persistent challenges of conflicting stakeholder objectives and issues related to coordination, corruption, and non-inclusion in decision-making about natural resources must be addressed to advance progress. Stakeholders were able to formulate specific recommendations and a participatory theory of change to inform the development of a sustainable landscape management plan and future evidence-based policy that could steer the WWC toward a more resilient and multifunctional system that equitably supports livelihoods, biodiversity, and wider economic development. We show that the methods for inclusive engagement in environmental decision-making are extrapolatable to other contexts facing similar social-environmental challenges.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

113

Ecological impacts of forest management on biodiversity and regeneration in the context of carbon offsets in Oaxaca, Mexico

Laura Arango

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Abstract

Community Forest Management is a significant carbon mitigation strategy that advances tangible economic and social benefits for local people while safeguarding forests, and their biodiversity and sequestering carbon. Oaxaca, southern Mexico, one of the pioneers implementing this approach, has been recognized as a success story for community-based forest management worldwide, establishing community conservation and management areas within its territories to produce sustainable timber and non-timber products. Despite this potential, during this century, Oaxaca has reported an annual forest loss of 25% due to mismanagement and exploitation of resources, and Mexico, in 2019, was one of the ten countries with the world's most significant loss of primary forest.

Despite the economic, social, and ecological benefits that Community Forest Management has, much remains unknown in monitoring and assessing the effectiveness of restoration practices. My research collaborates with the Zapotec community of Santa Maria de Jaltianguis to assess how carbon offset projects impact forest management practices (silviculture) and forest structure and composition. My study is gathering information on natural and artificial regeneration in mixed pine-oak forests to support timber production, carbon sequestration stocks, and biological conservation and contribute to the broader academic understanding of pine stand dynamics and silviculture in subtropical and montane

forests. Through on-the-ground fieldwork, I have collected data comparing natural and artificial regeneration under three management practices: Patch cut systems, Selection cut systems, and Conservation areas. By analyzing differences in growth and species across these treatments, we widen the understanding of how each scenario supports forest resilience, species richness and abundance, the good quality of timber and non-timber products, and how management under carbon offset projects can support multiple forestry objectives and products. The results will be used to inform future forestry management plans and policies to support sustainable timber production in biodiverse stands.

Primary FLARE Theme

Forests and trees in a just climate transition

Student Level

Ph.D.

114

FSC Demystified: Your Guide to Engagement

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Abstract

The Forest Steward Ship Council (FSC) is widely regarded as the 'gold standard for responsible forest management' ensuring sustainable practices for the benefit of forests, people, and markets. Despite its widespread application, researchers of different disciplines often conclude that more research is needed to demonstrate effects or absence of effects of certification interventions. In addition, researchers have differing opinions and approaches to assessing the impact of certification on biodiversity, livelihoods, value chains and the robustness of the certification system.

The FSC, on the other hand, endeavors to inform FSC management, staff, members, standard developers and assessors about research findings and recommendations related to forest management and impacts of certification. Above all, FSC wants to recognize its strengths and areas for improvement in order to address the weaknesses supported by scientific input, for example in the upcoming revision of the FSC Principle and Criteria for Forest Stewardship in 2025.

We want to bring science into FSC and FSC into science. With this workshop we would like to support sound research in contributing to inform scientists about how to access FSC standards and other FSC data, the processes behind the development of the standards and their interrelations, and how the certification system in general and individual safeguards such as the new Remedy Framework work.

With you we will choose concrete and current examples of certification decisions, to search on-line for the respective certification reports and the corresponding FSC policies and standards. We will show how certification decisions are made, when and how scientists and other stakeholders can influence the

content of the standards and the certification process, and how you can effectively use your findings and criticism to improve the system. Finally, we will present and receive research questions.

As workshop outcome we expect that you will be better prepared to make informed and independent assessments of FSC certification interventions on the forest ecosystem and affected people. Your study outcomes and your engagement will become useful to inform the FSC to maintain and enhance its status as 'gold standard for responsible forest management'.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

117

Engaging Youth in Community Forestry: Lessons from Oaxaca, Mexico

CONSTANZA MORA, James P. Robson

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Abstract

In this presentation, I will explore youth's perspectives on the current and future roles in their communities through two case studies in Oaxaca, Mexico, a region known for its extensive commons regimes and success in community forest management and will reflect on strategies that communities might adopt to enhance youth integration in these arrangements and structures. In Mexico, most forests are managed by Indigenous and local communities. Along with generating economic, social, and environmental benefits at the local level, the country's community-managed forests also contribute to regional and global biodiversity and carbon sequestration goals. Yet, in recent years, timber production in Mexico has fallen, and "owner" communities have been impacted by shrinking and aging resident populations. Some have struggled to maintain a broad and diverse membership invested in local forest management. This includes youth, who might take up governance responsibilities and forest work but instead often follow alternative livelihood options. The role of youth has been underreported in the commons and (broader) environmental governance literatures.

I conducted qualitative case study research for this study in Oaxaca, Mexico. Through focus groups, workshops and interviews, I engaged youth from two specific communities – one located close to a major urban center and one further away –. Additionally, I talked to and interviewed community leaders and "outside" experts supporting Oaxaca's community forestry sector. I will share my findings about how work and study aspirations are often mismatched with local employment opportunities and community membership expectations. These considerations often outweigh their attachment to their village, territory and forests. Although communities have made efforts to integrate youth into community forestry, strategies have rarely been co-designed (with youth), and success to date has been limited. The potential for youth integration was highest in the community located close to Oaxaca City, suggesting the importance of rural-urban linkages to young people. I present my findings that will provide communities, scholars, and practitioners with important insights about the need for youth

engagement and empowerment strategies and the broader implications for community, institutions and forest futures.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

118

What works in the forest, business, poverty and conservation nexus? 25 years of NTFP value chain development in Cameroon

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Abstract

- Cameroon represents Africa in miniature with still high levels of forest cover but increasing rates of deforestation, variable but common use of forest products for multiple subsistence and commercial uses, and despite situation moving from low to medium level development status– a still high incidence pf rural poverty particularly among marginalized societal and ethnic groups, often associated with forest product use and dependence.

- Cameroon has experienced over 25 years of interventions with development, conservation and research aims concerning "sustainable" commercialization, value chain development, alternative livelihoods, cultivation and domestication of non-timber forest products (NTFPs)

- Projects today continue to follow these intervention themes, for the same forest products, in the same regions, using the same rural development concepts and simplifications of forest-people-market relationships, often working top-down and drawing only on science based-knowledge.

- These development projects publish largely good news and success stories, based on short-term results and outcomes.

- In the sector, there appear few major shifts in prices and profits are earned by those at the beginning of value chains, value adding has increased but is limited, rates of cultivation and domestication are low, resource availability on ecosystem or landscape scale appears precarious for more species, and there is no cessation of deforestation.

- So, what is the legacy and long term impacts of these interventions? What have decades of interventions changed, for who and why? What's worked and not?

- What lessons can be learnt from evaluating successes' and failures? Looking at the expected outcomes and impacts and the unexpected legacies of such interventions?

- This article examines takes a critical, long-term view of evidence, involving the beneficiaries and implementers in the evaluation of socio-economic, political (governance and policy) and ecological outcomes

- Conceptualized in terms of the sustainable livelihoods approach and social ecological systems (i.e. impacts on livelihoods and -ecosystems of the landscapes where these products originate from) and taking a value chain approach to examine direct (and indirect) actors in the value chains.

Primary FLARE Theme

Human well-being, poverty and forests

120

Assessing the Gendered Impacts of the Forest Rights Act on India's Marginalized Community

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Abstract

The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of India, 2006 (hereafter Forest Rights Act or FRA, is a landmark legislation that seeks to rectify historical injustices experienced by the forest-dwelling communities by recognizing rights to forest access and use. Despite its slow and staggered implementation, studies have shown that FRA implementation has led to significantly increased household incomes, particularly in the eastern part of Maharashtra, where communities have begun to exercise their community rights to manage, harvest, and trade forest products. However, while evidence suggests tangible economic benefits, there remains a gap in understanding the intra-household level implications of FRA, especially concerning gender dynamics. Therefore, a nuanced understanding of the gendered impacts of the Act is essential to ensure its holistic implementation. To address this gap, we conducted empirical research in Maharashtra's Amravati district, a tribal-dominated area reported witnessing increased forest-based incomes post-FRA implementation. Through comprehensive household-level surveys and in-depth interviews, we collected detailed data on the intra-household level impacts of the Forest Rights Act (FRA), including key indicators of individual and household well-being such as poverty levels, women's labor force participation and empowerment. Our preliminary findings reveal high women's labor force participation post-FRA, however, their labor is undermined and undervalued, leading to gender-based wage disparities and limiting women's bargaining power over household income. Based on these insights, we propose gender-sensitive reforms for FRA implementation to address disparities and ensure equitable distribution of benefits. Overall, our study emphasizes the importance of gender-sensitive approaches in realizing FRA's transformative potential for attaining socially just and sustainable outcomes.

Primary FLARE Theme

121

Frontrunners in Forest Rights Devolution at the Crossroads: Path Dependencies and Their Implications for the Future of Community Forestry in Guatemala and Nepal

Dietmar Stoian[1], Anukram Adhikary[2]

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Abstract

Guatemala and Nepal are widely recognized as frontrunners in devolving usufruct rights to forest-dependent communities, with well-documented success in forest conservation, restoration, and livelihoods development. Both countries are facing different combinations of internal and external challenges that require innovative governance frameworks and development strategies for long-term viability of community forestry.

In Guatemala, community forestry figures prominently in the Multiple Use Zone of the Maya Biosphere Reserve. Since the mid-1990s, usufruct rights have been granted to local communities through 25-year community forest concessions managed by community forest enterprises (CFEs). Currently, 11 CFEs manage concession areas totaling 423,907 ha, with more than 23,000 direct and indirect beneficiaries. Annual sales of timber and non-timber forest products (NTFPs) amount to US$5-6 million, translating into revenues of US$220,000-880,000 per CFE and forest-based income of US$500-10,000 per CFE member. However, disputes over the use of the forest initiated by external stakeholders during recent concession renewal reflect the vulnerability of the process and the need for further consolidation.

In Nepal, 2.3 million ha of forests have been handed over to about 23,000 community forest user groups (CFUGs) since the mid-1970s, benefiting 2.9 million people directly or indirectly. The estimated number of CFEs varies between a few hundred and several thousand. Annual timber and NTFP sales amount to more than US$ 20 million each. CFEs sell timber worth US$4,725 per year on average, with US$50-100 accruing to each CFE member. Recent technical, economic, and demographic shifts have led to widespread inactivity of CFUGs, threatening the renewal of operational plans and community forestry altogether.

Our study reveals path-dependent trajectories of community forestry based on a comparative analysis of 19 enabling conditions in terms of political-legal frameworks, institutional support, market access, and forest product endowments. Acknowledging differences in the biophysical environment, demography, policies, and governance regarding community forestry, we show the importance of gender- and age-differentiated employment and income opportunities and the need for technical, socio-economic, and policy innovations to address internal and external limitations affecting its future viability. The findings are relevant also for other countries fostering community forestry in pursuit of forest conservation and livelihoods development.

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REDD+ impacts on forest conservation and local livelihoods: a longitudinal assessment in the Brazilian Amazon

Cauê D. Carrilho[1,2,3], Julia Naime[4], Adriana Molina-Garzon[5], Colas Chervier[1], Morsello Carla[2]

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Abstract

REDD+ (reducing emissions from deforestation and forest degradation) initiatives are supposed to advance forest conservation and climate change mitigation while improving rural livelihoods or, at least, doing no harm to local people. Accordingly, many initiatives provide incentives to enhance farmers' livelihoods and reduce their deforestation practices. However, evidence of such win-win outcomes is rare. Using counterfactual impact evaluation methods, we investigated the impacts of an incentive-based REDD+ program in the state of Acre (western Brazilian Amazon) on a series of land use and livelihood outcomes. Impacts were evaluated during and after the program, contributing to the scientific knowledge about REDD+ effectiveness and permanence of outcomes. We used panel survey data from 262 households (treatment: 150; comparison: 112) collected over three years (2010, 2013, 2019). We found that the program saved an average of ~1.80% of forest cover per participant household in the first years of implementation by reducing pasture expansion. Forest loss later resumed, but part of the previous forest conservation gains was preserved. On the livelihood side, impacts were not significant at the beginning of the program. Yet, long-term increases in farm and total income were detected. On aggregate, our findings suggest that incentive-based programs can achieve the hoped-for win-win outcomes for REDD+.

Molina-Garzon_Panel

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

125

Reserva Los Cedros Protected Forests and the Rights of Nature: Creating a Co-management Plan For Cloud Forests and Communities in NW Ecuador

Linda D'Amico

Winona State University, Winona, MN, USA

Abstract

After Los Cedros Protected Forests and the rights of Nature went on trial in Ecuador October 20, 2020, the Constitutional Court judges ruled in their favor after 14 months of deliberation. Based on science and the Precautionary Principle, they mandated that these mega-diverse cloud forests, one of the top Key Biodiversity Areas on Earth, be free from mining forever, and a co-management plan to linked Los Cedros Protected Forests, the ten neighboring communities and the Ministry of the Environment be elaborated and implemented. This is a critical planetary challenge: how can a co-management plan ensure conservation and sustainable livelihoods within the letter of the law/the rights of Nature?

Through a multidisciplinary approach (anthropological, legal, bio-geographical), my study shows possibilities for forest protection and restoration alongside livelihood security. These flora, fauna (including humans), fungi and microorganisms hold the steep Andean slopes/foothills together and circulate tons of moisture, a natural infrastructure contributing to the wellbeing of multiple species, ecosystems, and watersheds, who, combined with villagers and farmers, guard against overstepping water, land use, climate and biodiversity integrity planetary boundaries. Mega-bio-cultural diversity here in the Choco-Tropical Andes cloud forests offers the world dividends that sustain the biosphere and counterbalances climatic and eco-social risks.

This case exemplifies rather than getting into loss and damage compensation situations, we can technically apply the Precautionary Principle and help prevent disaster. Now it is urgent to fill the space between the law and reality through investment in villagers and farmers on the frontline of biodiversity conservation. Without support through scientific research, conservation initiatives, environmental and civic education that lead to jobs, rather than these cloud forests providing ecological security for rural communities, ecosystems, and the planet, their disappearance will bring greater disaster. These cloud forests are planetary insurance, and it is an intergenerational responsibility to care for them. They must be supported by ecological co-citizenship, a compact by which we care for each other and the planet.

Primary FLARE Theme

Forest governance from local to global

128

Telecoupled landscapes: how do distal material and immaterial flows affect forest conservation and local livelihood practices in Nam Et-Phou Louey national park in Lao PDR?

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Abstract

In forest and biodiversity conservation governance, place-based conservation interventions such as protected areas are the cornerstone. Protected area governance focuses mainly on localized threats and actions. In a globalized world, local threats to forests are increasingly linked to distal actors and causes. Similarly, conservation interventions in terms of protected areas are influenced by global targets, policies, and frameworks for nature conservation. Therefore, it is important to understand how these spatially distant actors and processes affect forest conservation and livelihoods in local socio-ecological systems. To analyze these connections between local and distal systems, our study uses a telecoupling framework, which is conceptualized as a heuristic lens that combines socioeconomic and environmental interactions between two or more socio-ecological systems that are spatially (or institutionally) distant. We apply a telecoupling approach as it offers to overcome the challenge of spatial disconnection in analyzing connections between distal socio-ecological systems in land system science. We selected Nam Et-Phou Louey national park in northern Laos as a case study. To understand what material (money, technology, etc.) and immaterial (discourses and information) flows exist and how these flows affect conservation and land uses in the landscape around the national park, we used a mixed methods approach including semi-structured interviews, focus group discussions and spatial analysis. Our study finds that distal flows create competition for different land uses and put pressure on forests. We also discover that local socio-ecological context mediates the manifestation of distal flows and creates new dynamics of land uses and livelihoods. Through the interaction with local social-ecological context, these flows further create a cascade of successive land use and livelihood changes. Our findings contribute to developing strategies for governing telecoupled flows and processes which underlie the localized threats and actions. Furthermore, by constructing a link between local socio-ecological outcomes and global conservation policies, our research contributes to a better understanding on the manifestation of supranational conservation policies and frameworks in local context. Through this, we aim to contribute to increased awareness of PA managers and policy makers of the importance of governing telecoupled flows and processes to deliver positive social and ecological conservation outcomes.

Primary FLARE Theme

Forest governance from local to global

Student Level

Ph.D.

130

The Aula Verde, a combination of aesthetic and ecological, to evoke a connection with nature.

Laura Passatore[1], Andrea Conte[2,3]

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Abstract

Coming into contact with a tree, being surrounded by trees, can make citizens aware of the role of trees in human life more than a lot of numbers can. The tree's capacity in regenerating ecosystems compromised by human activities and to cure the living beings is revolutionary and needs to be celebrated as a form of art. These have been the first intuitions of an artist who has long sought to show the invisible biological-physical-chemical processes.

Reflecting on these themes, we, an artist and a researcher, together with an architect and the local associations, created the first Aula Verde in the "Riserva Valle dell'Aniene" park in Rome. The Aula Verde, or "Tree Room" in English, is a Nature-Based solution (NBS) and a piece of Land Art, consisting of a stand of trees arranged in a circle with a specific design to give the perception of being in an outdoor vegetated room. Aula Verde aims to mimic the natural environment within cities, promoting awareness and emotional connection with nature. By incorporating aesthetic criteria to ecological ones, the effect of NBS on people is heightened. NBS becomes a climate action towards the common goal of avoiding human extinction.

Ecosystem services (ES) were assessed using i-Tree Eco software and citizens' surveys: Aula Verde Aniene sequestered 44 kg of carbon, avoided 120 litres of flooding, and removed 213 g of air-pollutants. Regarding Cultural ES, it was found that Aula Verde Aniene primarily affects mental and spiritual well-being. ES only highlights the tip of the iceberg of interconnections within ecosystems.

 We hope that Aula Verde will one day serve as a place of respite from the city, shielding visitors from external noise, inspiring them with its beauty. We dream that Aula Verde will one day represent a form of "*shinrin-yoku*" for citizens. This Japanese term means bathing in the forest atmosphere or taking in the forest through our senses, connecting with it.

We would like to expand beyond the ES assessment, embracing the One-health concept. This involves considering the human-tree system as a whole within the ecosystem, where the benefits are interspecific without boundaries.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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Exchanging Researcher Seats:Collaboration with Indigenous Researchers for a more sustainable Wildlife Management

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Abstract

A growing number of researchers and scientific institutions realize the importance to connect and complement western scientific knowledge with other forms of knowing. This turn towards epistemic pluralism requires researchers to engage in a collaborative and inclusive dialogue with the diversity of knowledge held by local and indigenous peoples and learn from it. Traditional Ecological Knowledge (TEK) is of particular interest for our study on sustainable wildlife management in the Colombian Amazon region, which is based on a biocultural and social-ecological systems perspective. We aim to contribute to this process by describing and analysing the collective learning experiences and methodologies we use to integrate institutions, people, knowledges, and actions at various scales. Over a period of 2 years, we developed participatory research with two teams of local indigenous researchers and carried out monthly workshops with local researchers inspired by Participatory Action Research (PAR). These workshops focused on TEK and local wildlife uses in two indigenous communities where two groups of local researchers cocreated participatory workshops with us. Combined with an ethnographic approach for data collection, we present the categories, variables, and information of TEK about their territories describing local cartography and knowledge about 65 species of wildlife, including their use. We first discuss our transdisciplinary research method and its significance for documenting and strengthening local TEK. In addition, our findings also show major threats to TEK, such as institutional and legal challenges, the role of traditional knowledge holders who act as guardians of TEK, and the socio-cultural transformations across the Amazon region. We conclude with insights how research can support TEK and be leveraged for more inclusive conservation and a more respectful interaction and sustainable use of wildlife.

Keywords: Traditional Ecological Knowledge, Indigenous researchers, inductive, participatory, wildlife

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Ph.D.

133

Climate mitigation-adaptation relationships within forest management in the fire-prone American West

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Abstract

Many Western US forests, with their dry, fire-prone ecosystems and exposure to climate-driven disturbances like drought and disease, provide a testbed for examining synergies and conflicts between two climate actions: supporting carbon cycling (mitigation) and reducing climate-related risk (adaptation). Addressing climate change requires mitigation of greenhouse gas emissions and adaptation to new climate conditions, and these two climate actions must operate in tandem. Therefore, their synergies and conflicts must be explored. Literature studying the dynamics of adaptation and mitigation is often conceptual, and empirical knowledge of mitigation-adaptation dynamics needs to be improved, as field demonstration of their synergy is sparse. In turn, we investigated perceptions of mitigation-adaptation relationships through semi-structured interviews with forest experts in the US Rocky Mountains and Pacific Northwest. Our research questions explored (1) perceived mitigation and adaptation action options, (2) conflicts and synergies between mitigation and adaptation in forest management, and (3) factors influencing mitigation and adaptation activities.

Most notably, our results emphasized the importance of geographic and ecological differences in determining an appropriate balance of mitigation and adaptation options. As the American West confronts growing climate-related threats, many experts in this study called for support to enable active management (i.e., thinning forests and returning fire to the landscape) to reduce climate-related risk and stabilize carbon in forests, a perceived necessity for carbon forestry projects. A popular framing among interviewees was that active forest management in these fire-prone forests can synergistically link mitigation and adaptation, while passive management (no management interventions) can increase forest disturbance risk. Identifying these framings can only go so far, so our study included insights on constraining or enabling conditions that influence the ability to plan and implement climate-related action within the context of western forests, including carbon markets' economic and political impact, financial requirements for fuels management, and public buy-in of forest management activities. Overall, exploring mitigation-adaptation relationship dynamics in fire-prone forests reveals a complex answer requiring sensitivity to local social-ecological context, viewing active forest management as compatible with mitigation and adaptation, and exploring the necessary conditions to enable a successful suite of climate-related activities in forestry.

Primary FLARE Theme

Forests and trees in a just climate transition

134

Traditional ecological knowledge and the challenges of governing forest fauna in the Colombian Amazon

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Abstract

The loss of biocultural diversity is a major crisis for humanity. Tens of thousands of species and hundreds of languages and human cultures at risk of disappearing under the current trajectory. The Amazon region represents a hotspot of biological and cultural diversity and is a particular case in point for the current challenges of reverting the decline in biocultural diversity. Although deforestation is a major threat for the integrity of the Amazon biome, the remaining intact forest ecosystems also face the often unrecognized threat of slow degradation due to habitat alteration and unsustainable hunting of forest fauna. Across the Amazon region, hundreds of Indigenous territories are protective islands for the last intact forest ecosystems. However, so far relatively little attention has been paid to how Indigenous peoples, their local institutions and norms are contributing to the sustainability of forest fauna use and hunting. One of the most important of these local institutions is traditional ecological knowledge that shapes local norms which play an important role in regulating hunting behavior, but at the same time these norms are rapidly eroding. Thus, it is crucial to understand how changes in these norms and knowledges affect people's ability to keep hunting traditions alive and, in turn, contribute to the diversity and abundance of forest fauna. Drawing on ethnographic observations and interviews with hunters and forest resources users in two indigenous territories in the Colombian Amazon region, I describe and analyze how changes in cultural norms and traditional ecological knowledge mediate hunting behavior and jeopardize the ecological and social integrity of ecosystem. I show that strengthening and support local institutions and TEK is essential for a more sustainable use of forest resources. I conclude that science and policy-makers need to pay more attention to the links between traditional ecological knowledge and fauna in tropical forsts, which is particulalry relevant in light of the accelerating and interconnected crises of the loss of biocultural diversity and climate change.

Primary FLARE Theme

Forest governance from local to global

135

Forests and People: Navigating Interactions, Trade-offs, and Positive Outcomes

Ana Paula de la O Campos, Amy Duchelle, Antonio Scognamillo, Joanna Ilicic, Nicholas Sitko

Food and Agriculture Organization of the United Nations, Rome, Lazio, Italy

Abstract

This session proposed by FAO delves into the complex dynamics between forests and human populations, highlighting the need for strategies that balance agricultural progress with the environment. It explores various facets and trade-offs inherent in these interactions, including the impact of agrifood systems on deforestation, the measurement of climate action impacts, and their socio-economic repercussions. Agrifood systems play a significant role in deforestation, contributing to forest loss through agricultural expansion and infrastructure development. However, they are also affected by deforestation, posing threats to food security, biodiversity, and soil quality. Likewise, climate actions, such as restrictions on natural resource use, can have adverse effects on food security and livelihoods. These intertwined relationships underscore the importance of thoroughly examining these connections to guide policies and practices towards sustainable development. Quantitative tools and

metrics are indispensable for understanding these intricate relationships and informing policy decisions. Anticipating the cost-effectiveness of various forestry interventions is crucial for achieving climate change mitigation targets. Additionally, comprehending the diverse impacts of forestry-related actions necessitates innovative approaches, given the complex interplay between forests and communities over time. While modelling evidence highlights the cost-effectiveness of forestry interventions, the lack of real project impact evaluations with reliable cost data can impede decision-making. The first presentation, by Amy Duchelle (Senior Forestry Officer), will cover *The State of the World's Forests* (SOFO) 2024, which focuses on forest-sector innovations and the need for robust monitoring and evaluation and adaptation management based on learning. Then, Antonio Scognamillo (Economist) will share findings from a systematic review exploring the interlinkages and trade-offs between agrifood systems and forests. Subsequently, the last two presentations will underscore the necessity for developing innovative tools and metrics to assess the impact and cost-effectiveness of forestry projects across various objectives, including climate action and socio-economic benefits. Joanna Ilicic (Economist) will present findings from an analysis of carbon mitigation estimates across multiple International Finance Institutions' (IFI) projects. Following that, Ana Paula de la O Campos (Economist) will introduce novel methodologies based on Earth Observation and Machine Learning techniques for evaluating the socio-economic outcomes of land restoration programs, illustrated by a case study from Nigeria.

Primary FLARE Theme

Human well-being, poverty and forests

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Greening for the Greater Good: Socio-Economic Impacts of Land Restoration in the Great Green Wall

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Abstract

We analyse the mid-term socioeconomic impacts of the Action Against Desertification in Northern Nigeria (AAD). A large-scale land restoration and livelihood development project aimed at halting the process of desertification in the Sahel, while sustaining these outcomes through improvements in household incomes and food security. Our evaluation uses a multi-method strategy to generate more rigorous evidence on landscape restoration and its impacts at household level. We input pre-restoration remote-sensed data into a machine learning-algorithm to identify comparable pieces of land to the programme's restoration sites. We then select comparison households from communities bordering these sites through a replication of the AAD's targeting process. Our impact evaluation strategy is based on propensity score adjustment techniques, applied to both survey and remote-sensed data. The main finding is that land restoration activities did not negatively affect food security, despite some restrictions imposed to the use of communal land, and that it led to a decrease in moderate food insecurity. Households in restoration areas changed their livelihood strategies towards more climate resilient

activities, increasing their participation in sales of livestock by-products and of high-value non-timber forest products. The analysis also provides an innovative approach to ex post evaluations of future land restoration programmes. This presentation is part of the proposed session by FAO entitled "**Forests and People: Navigating Interactions, Trade-offs, and Positive Outcomes, coordinated by Ana Paula de la O Campos".**

Primary FLARE Theme

Human well-being, poverty and forests

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Trees buffer the short-term effects of heavy rainfall on household food insecurity

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Abstract

Across the world people frequently have to cope with excessive weather, leading to negative effects on people's food security. With accelerating climate change the number and magnitude of extreme events will increase, and natural resource dependent people in low- and middle-income countries will be acutely burdened by weather shocks. It is therefore crucial to understand how extreme weather events affect people's food security and which factors could increase people's resilience. This work focuses on India, which is home to a quarter of the world's undernourished people and is expected to face additional weather shocks. We first used matching analysis to compare short-term food insecurity of households that experienced heavy rainfall to counterfactual households that did not. We found that households that experienced a heavy rainfall shock had lower food security scores two months after the shock. Second, we evaluated if short-term impacts on food insecurity could be mitigated by trees since they can provide food and natural infrastructure against weather shocks. We found that households with high tree density (above the median) did not have a difference in food insecurity score before and after a shock, while households with low density (below median) had lower food security after experiencing a shock. This difference may be attributed, in part, to the fact that households with high tree density do not need to change their dietary patterns, while those with low density of trees have to change their dietary sources such that they are eating less food generated privately and have to rely more on market.

Primary FLARE Theme

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State of the World's Forests 2024: Forest-sector innovations towards a more sustainable future

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Abstract

Support for innovation, in all its forms, i.e. technological, social, policy, institutional, and financial, is gaining traction globally as being crucial for the sustainable management of forests, trees and associated ecosystems. Innovation is essential for our transition towards a society that fully recognizes the real value of the wide range of benefits that forests provide. SOFO 2024 showcases cutting-edge processes, tools and technologies in various regions and at various scales, providing evidence and knowledge and generating lessons that can be applied in diverse contexts worldwide. It highlights innovations that are assisting efforts to halt deforestation and maintain forests, including through combining science, technology and traditional knowledge to support Indigenous Peoples as forest custodians and enable locally led integrated fire management. The report also shows how innovative approaches are bolstering the restoration of degraded lands and expanding agroforestry, including in the context of the Great Green Wall of the Sahara and the Sahel. It demonstrates how innovations are helping to sustainably use forests and build green value chains, including through improving connectivity along timber supply chains to reduce waste and increase the viability of sustainable forest management. While opportunities for innovations in the forest sector are vast, embracing the potential of forest-sector innovation requires safeguards to ensure it is done responsibly and inclusively. Ultimately, this will mean that the right innovation is adopted in the right place for the right reasons. Innovations must reflect and be sensitive to the needs, aspirations and unique circumstances of end users and other beneficiaries. The adoption of any forest-sector innovation should be accompanied by robust monitoring and evaluation and adaptive management based on learning. Unlocking the power of innovation offers a means for more-rapid progress on meeting our collective forest goals and embracing a more sustainable future.

This presentation is part of the proposed session by FAO entitled "Forests and People: Navigating Interactions, Trade-offs, and Positive Outcomes," coordinated by Ana Paula de la O Campos.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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Green returns? Analysing public investments in forestry for climate action.

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FAO, Italy

Abstract

Understanding the cost-effectiveness of various interventions and investments in forestry is essential for informed decision-making to achieve climate change mitigation targets and other policy goals. However, robust evidence, particularly through independent impact evaluations, is scarce, especially in low and middle-income countries. While the modelling evidence for the cost-effectiveness of forestry-related interventions is compelling, lack of impact evaluations of real projects with reliable costs data can influence decision-making.

Considering the extended duration and evaluative challenges inherent in forestry mitigation projects, prospective ex-ante estimates of cost-effectiveness from development agencies and funds are the most promising source of data for learning and analysing these interventions.

In this paper, we use a unique data set as entry point into understanding the effectiveness of forestry projects financed by the public sector. Since 2012, several International Financial Institutions (IFIs) follow a harmonized accounting approach to estimate GHG emissions from their agriculture and rural development projects. The EX-Ante Carbon-balance Tool (EX-ACT), developed by Food and Agriculture Organization of the United Nations (FAO) based on the Intergovernmental Panel on Climate Change (IPCC) TIER-1 methodology is consistently used by several IFIs to produce carbon mitigation estimates for these projects.

Using project data from IFIs and associated EX-ACT assessments, we construct a naïve, first-cut measure of cost-effectiveness for these projects based on their total costs and total expected mitigation. Our analysis of this measure allows us to evaluate the expected cost-effectiveness and its magnitude of variance among several real-world projects. The average cost-effectiveness varies across projects and within regions. They also depend on the approach adopted and benchmark used (such as additionality considerations) in estimating emissions.

With growing policy enthusiasm in both public and private sectors to scale-up forestry-based mitigation actions that also bolster livelihoods, we argue for a greater focus on impact evaluation in this space. Future comparisons can also benefit from greater methodological transparency and consistency.

This presentation is part of the proposed session by FAO entitled "Forests and People: Navigating interactions, trade-offs, and positive outcomes" - coordinated by Ana Paula de la O Campos.

Primary FLARE Theme

Human well-being, poverty and forests

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Communal and private land tenure effects on reforestation and poverty alleviation: a case study with Mexican ejidos

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Abstract

Climate change and rising inequalities are two of the major issues facing humanity in this century. As we deepen into UN decade for restoration, reforestation has gained traction as a key mechanism for mitigating climate change, with the dual potential for promoting development at a local scale. However, scaling up reforestation has been hampered by several barriers. Understanding the drivers and underlying forces of reforestation and poverty reduction can reveal more effective ways to scale-up this effort. In this study, we explore the role of a communal land tenure system as a driver of reforestation and poverty alleviation. We evaluate forest and poverty outcomes at the locality level (n = 199,391) using panel data on poverty with four time periods (2000, 2005, 2010, 2020). As localities are represented as point data and have no administrative boundaries, we construct Thiessen polygons to allocate area to each locality. In each polygon we calculate the area of forest cover change and the area under *ejidos*, the traditional land tenure system in Mexico, with varying amounts of communal vs. private land (our treatments). We also explore the role of migration and remittances as a mediator of this relationship. We use localities outside ejidos as counterfactuals for our treated polygons. Then, we build two-way fixed effect models incorporating several covariates known to be related to each of our outcomes (i.e. reforestation and poverty alleviation). Our work has the potential to stablish in the scientific literature a method to investigate point data for socioecological studies. Furthermore, this study advances understanding of the factors driving joint improvements in forest cover and human well-being, a major gap in the literature. Finally, results will provide support for decisions regarding policies to alleviate poverty in rural Mexico and promote reforestation. We hope that our study stimulates other researchers to make most out of the abundance of available data and advance our knowledge on the relationship between forests and human well-being

Primary FLARE Theme

Human well-being, poverty and forests

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The Politics of Wildfires: A Review and Research Agenda

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Abstract

As a relatively new area of research, studies on wildfire politics have been sparse and fragmented, primarily focusing on the Global North and technical matters such as fire management practices,

community preparedness, and post-fire recovery. The linkages between wildfires and rural livelihoods and development pathways in the Global South remain largely underexplored. This paper aims to bridge this gap by reviewing existing literature, focusing on research in political ecology, environmental economics, and human geography regarding the socio-ecological dimensions of wildfires in the Global South. Based on the original analytical framework established by the ERC-funded FIREPOL project, we identify key political drivers across three scales: i) *Supra-politics* or how policies and institutions shape wildfires, including key policy areas such as land use and agriculture, environmental regulations, economic and development models, and urban and demographic planning; ii) *Para-politics* or how actor-driven power dynamics, including patronage and clientelist networks, the alignment between political and technocratic visions of fires, and the role of social and environmental activism, interfere in the political process and are reflected in wildfire geographies; iii) *Infra-politics* or how cultural and identity systems and contentious politics shape wildfire at the local level, for example using wildfires as protest tools against national policy implementation. This effort is crucial in identifying key knowledge gaps and research pathways, including: the growing risk of transnational political crises driven by the intensification of wildfires and their externalities (e.g., haze clouds and pollution); the role of war and conflict in shaping regional wildfire patterns (and viceversa); the interactions between public health emergencies and extreme wildfires; the potential trade-offs between carbon offset policies for climate mitigation (e.g., tree planting) and fire risk. Methodological challenges, such as the lack of cross-national data on fire policies, and innovative research tools, such as remotely sensed data, are also discussed. In conclusion, the paper elaborates on how expanding knowledge on wildfire politics not only contributes to remedy the patchy understanding of the relationship between fire and anthropogenic actions, but also challenges the narrow public narrative of wildfires as 'natural disasters' to be mitigated or suppressed, grounded in (neo-)colonial views and practices.

Primary FLARE Theme

Forest governance from local to global

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Soil as a Source of Collective Belonging

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Abstract

In the face of escalating environmental degradation and widening social inequalities, our research probes the essential contributions of indigenous knowledge systems to fostering sustainable agricultural practices. These practices are distinguished by a profound sense of reciprocity and empathy, principles deeply rooted in indigenous cultures. Our study area, the buffer zone surrounding Masoala National Park in Northeast Madagascar, serves as a vibrant tableau illustrating the complex interactions between human communities and the broader ecological milieu, with a particular emphasis on soil ecosystems.

Our inquiry adopts a spatial perspective to unravel the dynamic interconnections among local communities, key crops (notably rice and vanilla), soil ecologies, and forest environments. Through immersive qualitative interviews conducted on extensive journeys to sites of cultural and agricultural import, we reveal a rich tapestry of values inscribed within the landscape. This exploration is augmented by innovative multimodal documentation methodologies, including videography, cartography, and camera-less photography, which cast new light on the pervasive movements of environmental and social injustices within the confines of primary tropical forest buffer zones.

Central to our exploration is cartography's role in indigenous governance, where mapping agricultural territories and zones of ecological significance allows indigenous communities to affirm their sovereignty and stewardship over their lands. These maps are not merely navigational aids but embody the deep-seated bond between these communities and their environment, facilitating the transmission of ancestral wisdom across generations.

Furthermore, our research emphasizes the volumetric complexity of soil ecosystems, portraying soil as a living archive that encapsulates both historical and contemporary narratives. This approach challenges the dominant colonial narratives that have historically marginalized indigenous perspectives on land and resource management.

Addressing the critical debates surrounding the decolonization of anthropology, our methodological framework is predicated on epistemological diversity, inclusive collaboration, and structural transformation within the academic sphere. By foregrounding collective and participatory methodologies, such as workshops, interviews, and community-led mapping exercises, our project seeks to empower indigenous communities to actively engage in the cartographic process. This engagement enables the co-creation of maps that reflect their spatial realities and governance needs, thereby countering cognitive injustices and combating epistemicide.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

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Impact of Community Forest Management on Forest and Poverty Outcomes in Cambodia

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Abstract

The communal management of forest resources has proven a valuable alternative to private and public regimes in reducing deforestation in a wide range of contexts, but often ignored is the impact on people

and poverty. In rural and low-income contexts, forest conservation and poverty are inextricably linked and should be treated as such in development research. Community forests are of particular interest because of their potential to simultaneously reduce deforestation and poverty at both the community- and landscape-level. In this paper, we use a quasi-experiment to estimate the large-scale, twin impacts of community forests on forest change and poverty in Cambodia from 2005 to 2020. To observe poverty, we develop spatially-interpolated and buffer-localized poverty indexes using three repeated cross-sections of DHS clusters. To analyze forest outcomes, we use annual remote-sensed tree canopy cover, forest change, and land use at 30m resolution. Outcomes are measured across 599 community forests over 20 provinces within both a pretreatment period from 1990 to 2005 and a treatment period from 2005 to 2020. To estimate effects, we first use spatial matching to develop a non-intervention group that is comparable to community forests in our sample along pretreatment biophysical, anthropic, and socioeconomic factors. Next, we use both mixed-effects and a differences-in-differences panel estimation methods to identify the causal impact of community forests on forest change and poverty at the country-level, controlling for spatial observables, spillover, and protected areas. We contribute the first empirically-rigorous analysis of the large-scale mutual incidence of forest-use and poverty outcomes arising from community forests in Cambodia.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

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Livelihood-Level Forms of Corruption and the Power of Forest Bureaucracy: A Case Study from the Sundarbans Mangroves, Bangladesh

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Abstract

Local forest-dependent communities in the Sundarbans mangroves in the Gulf of Bengal are witnessing a new era of conservation-focused interventions, climate-driven national policy programs, and growing commercial shrimp and tourism industries, all of which are exacerbating livelihood challenges for poor local forest-dependent livelihoods confronted with increasing regulatory limitations and powerful punitive ad-hoc approaches of regional forest administrators.

This study examines causal mechanisms of mangrove livelihood-related corruption, bribery and illegality practices through the eyes of local livelihood realities, analyzed through a qualitative political ecology approach to ethnography-style field research conducted over six months in five forest villages as well as with local-regional-national actors of Bangladesh's Sundarban mangrove governance.

The data outlines a broad range of small-scale corruption practices among state agencies, forest dwellers and elite groups such as boat license brokers, including illegal, unreported, and unregulated harvesting; incidents of harassment by state agencies and patrolling groups; misuse of institutional power and authority to achieve personal gain, manipulate the situation, accuse/arrest unknown people, file false cases, or force the accused to comply with alternatively offered bribes, and confiscation of license, boat, and fishing gear, among others.

The empirical data illustrates how illegality practices and their power relationships reinforce and compete with each other; how they undermine the efficacy and accountability of procedural governance modalities; and how they compound the vulnerability of already marginalized livelihoods by creating structural barriers and institutionalizing a culture of fear and prosecution in the everyday management of the Sundarbans mangroves.

The analysis identifies loopholes in present institutional arrangements and conservation policies that enable everyday administrative corruption in forest access, harvesting permits, boat licenses, revenue calculation, record keeping, and seasonal bans. The findings offer a twofold contribution: First, it offers qualitative contextual evidence of overexploitation mechanisms as conservation and sustainability goals are negatively affected by illegality in the Sundarbans' resource livelihood governance; and secondly, the case study contributes to a deeper understanding of local livelihood realities for more effective strategies against bureaucracy-based corruption and local poverty, toward local livelihood justice and sustainable mangrove conservation.

Key Words: Extra-legal management, forest governance, social justice, power relations, overexploitation

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

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The role of socio-political land tenure regimes for long-term forest restoration in the Atlantic Forest of Brazil

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Abstract

Forest restoration has gained traction as an intervention to mitigate climate change, contribute to biodiversity conservation, and achieve food and water sovereignty for local people. Despite its promise and opportunity, many restored forests have not persisted for the long term. Long-term forest

restoration is likely to vary according to land tenure regime—the tenure-related governance factors that determine territorial rights. Focusing on restoration reversals—restored forests that were later deforested—and restoration successes—restored forests that remained forested for the long term, our study investigated the longevity of forest restoration in approximately two million territories in the Atlantic Forest of Brazil from 1985 to 2022. We conducted a causal analysis of the long-term outcomes of forest restoration in Indigenous lands, Afro-Brazilian (*Quilombola*) territories, agrarian-reform settlements, and protected areas in comparison to private properties. We additionally developed a new technique within the field of statistical matching that overcomes past challenges for land tenure regimes that systematically have different spatial and biophysical characteristics. In a context of competing land claims, we found that Indigenous lands and agrarian-reform settlements had significantly more long-term restoration than private lands, while protected areas and *Quilombola* territories had no significant differences. By characterizing how restoration reversals and successes varied between land tenure regimes, our study contributes to understanding how transitions in land tenure regimes, such as through demarcation or land grabs, could influence the future of restored forests. Finally, we combined the analysis of long-term trends in forest restoration with a transdisciplinary participatory mapping analysis in six Indigenous, *Quilombola*, and agrarian-reform communities. We revealed some of the ways in which communities are constructing territory through forest restoration. Our findings may support efforts to improve the longevity of forest restoration as well as contribute to the justice and equity of forest restoration efforts.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Direct and indirect cocoa deforestation in the forest landscapes of Ghana

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Abstract

Cocoa is one of the main drivers of deforestation across the tropics. In Ghana, the world's second largest cocoa producer, the role of each of the main economic sectors in driving deforestation remains, however, contested - with cocoa, mining, logging, and plantations each blaming the others, including food crops. Previous work has suggested that food crops are themselves displaced into forests by cocoa expansion, also raising concerns about food availability. Here, using satellite-based maps and secondary statistics, we quantify the direct deforestation drivers between 2000 and 2019 in the entire cocoa-growing region of Ghana. Then, we use a land-balance approach to assess the indirect role of the expansion of land uses in food crop deforestation. We find that cocoa is the major direct driver, followed by food crops and logging. Roughly one-fourth (20%-31%) of the deforestation and degradation linked to food crops can be attributed to the expansion of other land uses – with 13% (6%-16%) due to cocoa expansion. In cocoa-saturated regions, indirect cocoa deforestation is likely to increase as forests only remain in protected areas, where growing food crops is more tolerated by officials than cocoa. This research highlights the need to move away from sustainability efforts targeting one single commodity at a time, as well as

the need to question the size of agricultural sectors, here, cocoa, and their induced trade-offs: how much land do we use for what specific goals – of whom –, at the expense of what others?

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

150

A high-resolution, global analysis of the factors driving tree cover gain

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Abstract

Trees and forests are critical for climate, biodiversity, and human well-being. As such, expanding tree cover has been promoted as an efficient means for simultaneously tackling multiple global challenges (climate change, biodiversity loss, and poverty) and has become a global policy priority. In many places tree cover has increased over the past few decades. Some countries and regions have even experienced a forest transition - a reversal in tree cover trends from net loss to net gain. Most evidence on the drivers tree gain originates from national and sub-national case-studies, meaning results may be context-specific with limited generalisability. There is very little evidence of the factors associated with tree cover expansion across very large scales. Here, we take advantage of new high-resolution, time-series data on tree height to identify common factors associated with persistent gains in tree cover at the global scale. Recognising that the type of tree strongly influences the benefits for people, climate, and biodiversity, we use secondary data to differentiate between gains in natural tree cover and plantations and run our analysis separately for each. Using a spatial multi-level regression, we assess the relative importance of various biophysical, demographic, and socio-economic factors operating across a range of scales (from the pixel to the country level) at predicting gains in natural tree cover and plantations globally. Results reveal the relative importance of large-scale factors (e.g. macroeconomic trade policies) versus local characteristics in influencing local tree cover dynamics, and the roles of economic development, agricultural change, migration, conflict, and land governance in driving gains in natural tree cover versus plantations. By identifying common drivers and enabling contexts associated with the expansion of natural tree cover across very large scales, the study will help to inform and target global forest restoration efforts and fill knowledge gaps in data-poor regions.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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To what extent social forestry and marine protected areas help conserve mangroves and alleviate poverty in Indonesian villages?

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Abstract

Mangrove forests are situated in the transitional zones between terrestrial and marine ecosystems, providing key environmental services essential for both wildlife and human populations. Despite its ecological importance, mangroves worldwide are being converted to other land uses, such as to aquaculture and human settlements. In this study, we assess the impact of both social forestry and marine protected areas on mangrove conservation and poverty alleviation in Indonesian villages. Our analysis encompasses 6,911 villages, comprising villages with existing mangrove ecosystems and those biophysically suitable for mangrove growth. We use publicly available datasets, such as those from MapBiomas Indonesia, to measure changes in mangrove forest cover over time. Additionally, we use the social resilience and economic resilience indices developed by the Ministry of Villages, Development of Disadvantages Regions, and Transmigration to measure poverty alleviation. These indices, informed by multiple waves of village survey data (2000, 2008, 2011, 2014, 2018, and 2021) from the Indonesian Statistics Agency, echo aspects of the multidimensional poverty index developed by Oxford Poverty and Human Development Initiative. We build two-way fixed effect panel model incorporating several covariates known to be influential to each of our outcome variable (i.e., mangroves growth/deforestation reduction and poverty alleviation). Furthermore, we also consider the interaction between social forestry, marine protected areas, and other direct and/or indirect factors that may influence mangrove conservation and poverty reduction. One example is investment in basic public infrastructure (e.g., healthcare and education facilities, roads) essential for value-addition in remote areas, recognizing that rural poverty stems partly from limited access to public services and connectivity. Through our study, we aim to deepen our understanding of the interconnected factors that facilitate both mangrove conservation and improvements in human wellbeing. Our findings also help inform government officials and practitioners involved in social forestry and mangrove conservation, fostering a more cohesive evaluation of the global agenda for forest-based climate mitigation, conservation, and advancement of community rights.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

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Integrating Peatland Management and Community Development for Sustainable Livelihoods on Peatlands in West Kalimantan

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Abstract

Indonesia has the fourth largest area of peatland in the world, which plays a role in storing large amounts of carbon, regulating landscape waters, and is an essential habitat for biodiversity. On the other hand, Indonesia also contributes to peat degradation, caused mainly by unsustainable livelihood practices, including draining and burning peatlands. Solving the problem of peat degradation requires a holistic and proactive approach across biophysical, social and economic dimensions to shift to more sustainable livelihoods. This research aims to identify strategies for peatland management and sustainable livelihoods. The data collection methods used in this research were literature reviews, key informant interviews, and focus group discussions. The data analysis used was content analysis, coding method analysis, and gap analysis. The research results show that symposium activities, social media content and training were carried out to increase public understanding regarding sustainable livelihoods. The symposium presented topics on peatland water management, livelihoods on peatland, technology on peatland, and the role of the younger generation in peatland awareness and haze mitigation. Social media content was done through photo contests to encourage participation and engagement, as well as awareness-raising strategies. Meanwhile, the training focused on material on sustainable peatland use and haze mitigation, peatland water management, sustainable livelihoods for local communities, and peatland burning/degradation. These activities have increased people's understanding of peatland. However, based on gap analysis, gender aspects have not become a top priority in local community livelihoods and peatland management issues. This research produced several lessons, such as 1) the importance of increasing community participation, including women's groups and comprehensive policies in preventing peatland fires, and 2) identifying the lack of access to economic opportunities as a cause of changes in peatland practices and management.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Gender Quotas & Broadening Participation in Forest User Groups

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Abstract

The inclusion of women in environmental decision-making is widely believed to improve conservation outcomes and can be considered normatively desirable independent of outcomes. Gender quotas have been proposed as a policy intervention to ensure descriptive representation of women. In Nepal, Community Forest User Groups (CFUGs) manage more than a third of forested land under the country's community forestry program, which is regarded as a model forestry decentralization policy. Current governmental guidelines set a target of 50% women on the executive committee of these groups, though this target has not been fully achieved to date. One possible effect of a gender quota for executive committee membership is that the representation of women in leadership may motivate more people (perhaps especially other women) to participate in the CFUG more broadly. This study uses an original survey experiment framed around community-based forest management that was administered to survey respondents in 100 villages in rural Nepal (N = 1,243). The survey experiment exposed respondents to a vignette describing a hypothetical CFUG in the respondent's village, which was randomly varied with respect to the number of women required to be included on the ten-member executive committee. This was followed by survey questions that asked respondents whether they would engage in a number of participation activities if the group existed in their village. We find that having more seats reserved for women on the executive council leads to a statistically significant increase in the probability that female respondents report being likely to join the group, and it also increases their likelihood of attending meetings. Furthermore, our results suggest that more women on the executive committee predicts a higher probability of 'active' participation'—joining the institution, attending a meeting, and speaking up at the meeting—among women respondents. Our findings suggest that gender quotas requiring the presence of a women in leadership roles can induce other women to engage more actively in community-based forest management, without discouraging participation among men.

Primary FLARE Theme

Forests and trees in a just climate transition

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Not only work but decent work: Social security coverage for forestry workers in low to upper middle-income economies

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Abstract

Access to social security for persons employed is a core element of decent work and can lead to multiple benefits, such as reducing poverty. Hence, analysing employees' social security status is a prerequisite for supporting policymaking to achieve decent work. This study uncovers the current state of social security contribution among people employed in forestry, focusing on low to upper-middle-income countries (n=37) of the Global South. It further examines whether correlations exist between the social security contribution of forestry workers and ratifying International Labour Standards, notably the Social Security (Minimum Standards) Convention, 1952 (No. 102). Employment share with social security contribution in total forestry employment derived from the harmonised microdata collection of the International Labour Organization is used as a proxy indicator. Results reveal that less than a quarter of forestry workers are affiliated with at least one social security scheme. Low-income economies have the lowest average share of employees, with social security contributions at 5% of forestry employment. Middle and upper-middle-income countries, in comparison, show a larger share, with approximately 17 and 20% of forestry employment, respectively. Outcomes of Seemingly Unrelated cross-country Regression (period 2001-2022) indicate that the level of forestry workers covered by at least one social security scheme is significantly associated with ratifying Convention No. 102. Findings also show that disparity in social security coverage is explicitly related to the widespread informality in this sector. Due to the often hazardous working conditions and seasonal demand for labour, access to social security, such as benefits in the event of accidents at work, health care and income security, is of particular relevance for forestry workers. The lower employment share with social security contribution underscores the need for sustained efforts to ensure the minimum social security standards. Although ratification of Convention No. 102 may enable an extension of social security through national legislation, its effectiveness depends to a large extent on sound implementation with the support of national labour market institutions. The high degree of informality in forestry can be a barrier in extending social security. Likewise, not being able to enjoy adequate social security may also affect employment choices.

Primary FLARE Theme

Human well-being, poverty and forests

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Jabini et al 2024-FLARE abstractThe Landmark Saamaka judgment; a shield against deforestation within Saamaka land?

Hugo Stuart Jabini[1], Sara Ramirez[2], Nicolaas Stiefen Petrusi[3], Wanze Eduards[1], Fergus Mackay[4]

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Abstract

We, the Saamaka people of Suriname are traditional owners of of more than a million of tropical rainforests possessing invaluable traditional knowledge and deep cultural ties to our lands and

resources. However, we have endured historical injustices and ongoing challenges in defending our forest and rights from commercial logging and mining which is increasingly weakening our capacity to control and manage our forest, In 2007, we celebrated a victory when the Inter-American court of Human rights (IACTHR) ruled in our favor, ordering the State of Suriname to legally recognize the ownership and self determination rights of the Saamaka people. That victory also changed international jurisprudence , among others, so that free, prior and informed consent (FPIC) is required for major development projects in Indigenous and Tribal lands throughout the Americas. Despite this collective and remarkable achievement, deforestation and forest degradation have increased fourfold within our lands since the date of the judgment due to commercial logging and mining. Hence, we continue to be legally defenseless against forest loss, livelihood loss and land dispossession. To what extent do international court orders protect tribal people's rights, enable the realization of social and environmental justice and are a shield against deforestation? More and more conservation by indigenous and afro descendant and local communities is recognized as the most effective, and there fore we have been given the critical role of saving the planet. How ever , unless there is justice to our efforts, we wont be able to deliver on international conservation goals.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

167

Navigating Covariate Shocks: Nepal's Community Forestry and Livelihood Sustainability during COVID-19

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Abstract

The COVID-19 pandemic, as a global covariate shock, affected all socio-economic strata but with disproportionate impacts. This raises the question: *how does community forestry governance affect livelihood resilience to such shocks?* Our study situates itself in the forests and livelihoods domain to address this question, focusing on the role of Community Forestry (CF) in Nepal in mitigating pandemic-induced socio-economic disturbances.

Our study utilizes the Sustainable Livelihoods Framework (SLF) to evaluate the resilience of forest-dependent communities in Nepal amidst the COVID-19 pandemic. It quantitatively explores how the five capitals—natural, physical, human, social, and financial—affect the communities' response to this covariate shock. A recursive bivariate probit model, based on a random sample from 872 households across 55 Community Forest User Groups (CFUGs) in Salyan and Pyuthan districts, is estimated to examine the interconnectedness of the capitals with COVID-19 incidence and related impacts while integrating governance quality, social hierarchy, rule compliance, and livelihood strategies as other explanatory variables. The model is clustered geographically to incorporate spatial dimensions and accounts for unobserved heterogeneity among CFUGs and districts.

Our findings indicate that while natural capital is limited in reducing vulnerability to COVID-19, enhanced physical capital correlates with increased vulnerability by 9.4 percentage points. Further, households more reliant on timber resources are 1.7 percentage points more susceptible to the pandemic's adverse effects than those reliant on non-timber forest products. Significantly, CFUGs' efficient mobilization of COVID-19 relief is associated with a significant reduction in vulnerability, suggesting that strong CF governance can act as a critical safety net.

The implications of this research are important for future policy and resilience planning. We show that CF, through its governance, plays a significant role in socio-economic sustainability during global health crises. The findings advocate for the integration of CF in national economic policies and stress the importance of local governance structures in fostering community resilience, thus informing strategies for sustainable recovery and preparedness for similar future shocks. Our study underscores the importance of robust local governance in natural resource management as a cornerstone for resilience against covariate shocks.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

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Revitalizing Kenya's Arid Landscapes: Unlocking the Potential of High-Value Plants through Forestry Extension and Resource Handbook in Garissa and Beyond"

Amina Maalim[1], Ahmed Mohamed[2], Abdilatif Haret[3], Mohamed Osman[3], Philip Looniyo[4]

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Abstract

Kenya faces significant challenges in its dryland regions, which comprise over 80% of the country's land area. Human activity and climate change have led to widespread degradation of these ecosystems, exacerbating vulnerability to drought and threatening essential services like water, food, and biodiversity. Factors such as encroachment, overharvesting, overgrazing, and land fragmentation have contributed to this degradation, necessitating urgent restoration efforts. Despite government and partner initiatives, restoration strategies have often failed due to prolonged droughts, pests, diseases, and over-browsing. To improve success rates, scholars recommend conducting comprehensive audits of ecological types and community needs to inform appropriate interventions. However, a lack of documentation on indigenous knowledge of high-value plants suitable for restoration presents a challenge.

To address this gap, we conducted a study in Garissa County involving 88 respondents from 44 farming and pastoral groups across 15 wards. Both primary and secondary data collection methods were employed, revealing 189 high-value plants, including 88 trees, 58 shrubs, 9 herbs, 25 grasses, and 9 climbers. Among these, 41 were identified as extremely overused, 39 as overused, 61 as moderately used, 6 as rarely used, and 3 as abundant locally. The research also highlighted variations in species assessment between international and local communities, with riverine areas showing less diversity but greater lushness and wet landscapes exhibiting increased diversity.

Communities identified over 30 uses for these plants including Food, fruits, fodder, construction, firewood, herbal medicine, fence (both dead and living), catchment protection as ecological indicators, etc., providing valuable insights for species selection in restoration initiatives. The study advocates for compiling this knowledge into an extension and resource handbook to guide restoration activities and improve plant survival rates to sustain the current and future generations.

This initiative is an example of how the national, county, and institutions can collaborate on environmental protection and conservation in line with the Constitution 2010 of Kenya (Article 69). Communities to derive socio-economic benefits and will contribute to the achievement of 30 % tree cover and pre-empt the UN-decade declaration on Ecosystem Restoration. We recommend compiling a regional resource handbook for the drylands of the Horn of Africa.

Primary FLARE theme?

Data and methods for understanding forests and human well-being

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Theorizing on a "jelled institutional arrangement" in forest resource settings: Reflections on the framework conditions

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Abstract

The theoretical link between natural resources and institutions has gained traction in global scientific and policy circles. Scholars argue that the functioning of both formal and informal institutions leads to (sub)-optimal outcomes in natural resource settings, including forests. The theoretical argumentation of institutionalists (e.g. Hardins, Ostrom, Ensminger, Cleaver, and Haller) is yet to fully address the (in)efficient resource management question – largely attributed to the uncoordinated co-existence of formal and informal institutions. For instance,

Ostrom's success principles for common pool resource management virtually ignored the question of power asymmetry. Haller's constitutionality acknowledges that in resource settings, local well-functioning institutions were unsustainable due to the limited formal state recognition. The uncoordinated co-existence of formal and informal institutions sometimes gives resource appropriators the leverage to selectively draw from this "institutional toolbox" as they navigate the daily process of resource appropriation – a bricolage approach, as argued by Cleaver. To advance the theoretical search for a unifying and well-working forest resource management institution, this paper proposes an institutional change path towards a jelled arrangement as a useful research and policy pathway. Institutional jelling is construed as the careful, tactful and systematic process of combining compatible elements of formal and informal institutions and reformulating incompatible ones, to create a new, acceptable and unifying form of institution that enjoys legitimacy from both formal and informal natural resource actors. In this light, two questions are raised: (1) under what conditions can a jelled institutional arrangement be established in forest resource settings? (2) What are the future research questions to guide the empirical substantiation of a jelled forest management institutional arrangement? This paper employs the theoretical research approach and a backward snowballing literature review and reflects on questions to be explored through fundamental and applied research, to ground the theoretical position in forest resource settings around the globe.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

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Relative effects of protected areas, community forests and international migration on forest cover and poverty in Nepal.

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Abstract

Over the past decade there have been substantial methodological advances and increases in the availability of data to understand the social and environmental impacts of forest-sector policies. Less attention has been paid to understanding the relative effects and interactions of different interventions that co-occur in both space and time, and how their impacts are influenced by broader socio-economic changes. Such insight is critical to understanding what interventions have worked where, why and for whom. We generate a harmonized national-level dataset for approximate 3,300 village development committees in Nepal to understand the relative effects of community forest management (CFM), protected areas (PAs) and international migration (the country's largest socioeconomic and demographic change over the past two decades) on forests and poverty. We find that protected areas,

community forests and international migration led to reductions poverty between 2000 and 2010, but that only community forests and international migration led to reductions in deforestation over the same time-period. Critically, we find that international migration acts as a significant moderator of PA and CFM effects: PA effects on poverty reduction are larger in high international migration areas, while international migration appears to reduce the poverty alleviation effect of community forests. Our analysis provides novel insights about forest policy mixes, and how their effects are shaped by socio-economic contexts.

Primary FLARE Theme

Human well-being, poverty and forests

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Assessing multiple benefits of people-centered biocultural restoration

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Abstract

Restoration is currently amongst the most important tools for conserving biodiversity but participation of local communities on its planning and design must be improved. Here we propose a people-centered biocultural approach to restoration combining both indigenous local knowledge and scientific methods. This novel framework aims to select species for restoration that can attend to both human welfare and biodiversity conservation. We provide an illustrative example framed at the Caatinga dry forest where we simulate agroforestry productive systems based on species previously selected by local dwellers due to their importance for water, energy and food securities.This simulated systems were subsequently evaluated in terms of functional diversity against the natural vegetation. We found that common native and some exotic species with low invasive potential dominated the average productive system. These useful species were able to maintain similar functional diversity when compared to natural vegetation but with a slightly different functional profile. Simulated systems are dominated by plant species with more acquisitive functional strategies when compared to native flora. The adoption of the biocultural approach to restoration programs in the region represents an important recognition of peoples' wills with little effect on ecosystem functional diversity. The framework can be readily adapted to various contexts for evaluating both cultural preferences and the ecological efficacy of biocultural restoration initiatives globally.

Primary FLARE Theme

Human well-being, poverty and forests

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Unearthing Roots: A Systematic Review of Agrifood Systems' Role in Driving Deforestation and Its Impacts

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Abstract

Understanding the intricate links between agrifood systems and deforestation is crucial for devising strategies that balance agricultural development with environmental conservation. Agrifood systems are significant drivers of deforestation, contributing to the loss of forest cover through agricultural expansion and infrastructure development; they are also impacted by deforestation in ways that threaten food security, biodiversity, and soil health. This dual relationship underscores the urgency of investigating these connections to inform policies and practices aimed at sustainable development.

This study implements a systematic review of the literature to unravel the complex dynamics between agrifood systems and deforestation. Employing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach, we analyzed 146 academic articles published across 37 journals from 1991 to 2022. Our sample of records also includes two books. The study enabled the categorization of the literature around three main themes: (a) the drivers of deforestation related to agrifood systems, (b) the impacts of deforestation on agrifood systems, and (c) the policy recommendations to address the complex interlinked relationship between deforestation and agrifood systems.

The findings reveal that the main drivers of deforestation related to agrifood systems are the expansion of the agricultural frontier and infrastructure development, which are in turn driven by economic incentives and gaps in governance and policy. These elements lead not only to environmental degradation but also set off a cascade of feedback impacts on agrifood systems themselves, including reduced biodiversity, soil degradation, and compromised food security.

These findings suggest that addressing deforestation requires a multifaceted approach that integrates environmental conservation with agricultural development. Land use planning and zoning, promotion of sustainable agricultural practices, enhancement of land tenure security, and fostering socioeconomic development emerge as pivotal areas for policy intervention. These strategies aim not only to curb deforestation but also to ensure the sustainability and resilience of agrifood systems, highlighting the interconnectedness of environmental and agricultural policies, which is key to reconciling agricultural productivity with the preservation of our planet's forests.

*The presentation is part of the FAO proposed session "**Forests and People: Navigating Interactions, Trade-offs, and Positive Outcomes, coordinated by Ana Paula de la O Campos***

Primary FLARE Theme

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Livelihood resilience capacities interaction in the Pacific coast of Mexico households

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Abstract

Local and global threats accentuate inequalities and poverty conditions in rural regions, decreasing households' opportunities to survive and cope to those disturbances. In order to respond to these stressors, households implement many livelihood strategies that need to be maintained or improved on time for their survival. In that sense, households' livelihood resilience means the possibility to retain capacities that allow livelihood functioning in order to avoid unacceptable standards of living when coping with stressors and shocks. In this research, capacities are related to capital assets (social, natural, physical, financial, human) access and amount, as well as self-reliance, learning, diversity and connectivity. Particularly the aim of this research is to analyze the interaction between those capacities in order to understand the complexity of household's dynamics. For that purpose, an index for each capacity was built and measured for the same households in two periods of time (2013 and 2016). Then, using an econometric model the variation of capital assets was related to changes on self-reliance, learning, diversity and connectivity. Empirical evidence is showed using a panel survey for 85 households located in the south Pacific coast of Mexico. The model shows that a positive variation on the assets index is explained by an increase on diversity and connectivity index. This paper explores the relationship between capacities instead of a juxtaposition of indicators in order to go further on understanding capacities interactions within the households. Livelihood resilience and the analysis proposed in this paper are an interesting approach to understand human well-being, poverty and forests

Primary FLARE Theme

Human well-being, poverty and forests

184

Analysis of non-timber forest products (NFTP's) value chains in the Cerrado and opportunities for their further development: Study case of Pequi (*Caryocar Brasiliense*)

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Abstract

In this study, we seek to explore the value chains of non-timber forest products (NTFPs) in the Brazilian Cerrado biome, with an emphasis on the iPequi fruit (*Caryocar Brasiliense*), a native fruit with an important economic role in the region. Our aim is to discover new sustainable strategies for the region that can promote economic growth while conserving natural resources.

Considering the ongoing threats to the Cerrado ecosystem, such as deforestation and agricultural expansion, there is an urgent need to explore sustainable alternatives. Non-Timber Forest Products (NTFPs) have emerged as a viable solution, promoting inclusive value chains and biodiversity. However, research on NTFPs in the Cerrado is limited compared to the Amazon, requiring more comprehensive data, from extraction to marketing.

Using a mixed-methods approach, our study assesses the predominant marketing of Pequi in the Cerrado region through interviews with members of the value chain and key informants. Our preliminary results offer insights into the current performance of the Pequi sector, including prices, added value and identified obstacles. In the future, we intend to delve deeper into aspects such as socio-economic impacts, environmental fragilities and social disparities.

The findings of this research aims to contribute to determining the feasibility and potential pathways of further value chain development of Pequi in the Cerrado region, including the assessment of sustainable strategies such as agroforestry integration and cooperative marketing initiatives. Understanding the socio-economic dynamics, environmental implications, and challenges in Pequi production and marketing allows for the development of effective strategies promoting inclusive and environmentally sustainable development in forest regions. These insights can inform policymakers, practitioners, and researchers, facilitating informed decision-making and targeted interventions to support sustainable management of natural resources and rural livelihoods.

Situated within the broader theme of sustainable forest management and livelihoods, our study aims to highlight the importance of integrating social, economic and environmental considerations into natural resource governance. By promoting multi-stakeholder dialog and collaboration, we aim to support efforts towards more resilient and equitable forest economies around the world.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Master's

185

The benefits and costs of military campaigns for conservation enforcement: Evidence from Central Africa

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Abstract

Militarized conservation enforcement approaches, a relatively recent innovation in conservation enforcement in many contexts, have been the subject of considerable academic and policy debates. Proponents of such enforcement approaches argue that the use of military forces, tactics, and technologies in conservation enforcement makes such enforcement more effective in conflict-prone settings. Critics have challenged this assertion, while also arguing that such enforcement approaches lead to violence. This study brings quantitative evidence into these debates. Using longitudinal data on a large-scale mobilization of military forces for conservation enforcement in Central Africa, we estimate the causal effect of the campaign on wildlife poaching incidents through a covariate matching approach. We find that the estimated effect is substantively small. We also use qualitative data from poaching incidents in the region to theorize about the realities on the ground that constrain the effectiveness of such campaigns, and show that the military campaign in Central Africa was associated with considerable enforcement-related violence. In general, our findings suggest that this innovation in conservation enforcement has probably failed to deliver significant conservation benefits, likely because illicit resource users adapt through a variety of strategies that help them evade enforcement.
Panel coordinator: Molina-Garzon_Panel

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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Community-based mangrove management to enhance the conservation and restoration of mangroves for more resilient coastal livelihoods

Valerie Hagger

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Abstract

Understanding how we can reverse the continuing global decline of mangroves is crucial to support the livelihoods of coastal communities and healthy oceans. Recently, we found that countries with more community-based forest management (often called community forestry) had a positive impact on mangrove cover, suggesting that community forestry is a promising strategy to reverse mangrove losses. In drylands, community forestry has been shown to reduce both forest loss and poverty, however effectiveness varied across social and biophysical contexts. In mangroves, communities can manage resources for both forestry and fisheries, and while there are regional studies demonstrating the success of community-based management of mangroves, knowledge on the drivers of sustainable management in different social-economic, biophysical and political contexts is needed to design policy and programs for successful management of mangroves by communities. This presentation will identify the factors that influence the success of community- or Indigenous-based management of mangroves and associated coastal ecosystems, based on a meta-analysis of published case studies across mangrove-holding nations. The global analysis is considering the influence of factors such as country policy, property rights, Indigenous rights, community forestry approach, local governance, benefits, and resource dependence, in the context of Ostrom's Design principles for common-pool resources within social-ecological systems. The analysis is also using remote sensing to assess the health of mangroves over time within community-managed areas as a monitoring tool. Investing in community initiatives to protect and restore mangroves has the potential to reverse the global decline of mangroves, addressing the biodiversity and climate change crises, while supporting livelihoods.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

187

Contemporary imaginaries of forest restoration shaped by historical policy shifts: Evidence from Himachal Pradesh, India

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Abstract

Contemporary policy discourses for forest restoration and nature-based solutions often overlook longer histories of policy measures that may play a key role in the success of interventions. This paper examines the history of forest restoration initiatives undertaken in Himachal Pradesh, India. We explore how ideas of tree planting have evolved over the past several decades, from production forestry in the 1960s – 1980s to 'social forestry' in the 1980s and 1990s to contemporary agendas for carbon sequestration and "nature-based climate solutions". We focus on interactions between multiple formal and informal institutions that have shaped the operationalization of these restoration priorities across space and time. Tracing the transition in these management regimes broadly indicates a shift from a more top-down bureaucratic decision-making structure towards finding newer spaces for decentralized decision-making. Enabling laws and policies for self-governance since the late 1990s and early 2000s

have also provided windows of opportunity for moving towards people's participation in the process of development and empowering local institutions. In recent times, these local institutions (such as the 'Panchayats') are emerging as a node for convergence for various actors to undertake the planning and management of natural resources. Drawing upon in-depth qualitative fieldwork across two villages in the Kangra District of Himachal Pradesh, we examine the different ways in which multiple formal and informal institutions have evolved over time to assume newer roles and responsibilities with respect to tree planting and forest restoration. By studying a history of policy interventions and institutional change in the study region, we analyze how contemporary restoration and tree planting efforts may work in and through existing local institutions in a way that can be more responsive to local needs and interests.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

188

Tenure, FLR, and Livelihoods: Findings from a Comparative Research Project in Cameroon and Madagascar. Parts I and II. Organizer Part I: Rebecca McLain, CIFOR. Organizer Part II: Anne Larson, CIFOR.

Rebecca McLain[1], Anne Larson[2]

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Abstract

African nations have committed to restoring 100 million ha by 2030. This goal is achievable only if restoration is accompanied by improved livelihoods for local people. As more resources are invested in FLR initiatives, three key questions have emerged: 1) Whose livelihoods are being improved? 2) To what extent do these initiatives incorporate livelihood needs and preferences regarding FLR practices? and 3) How do tenure security perceptions affect local people's willingness to adopt FLR practices?This panel session explores these questions by drawing on data from a comparative research project that examined the link between FLR, tenure security, and livelihoods in Madagascar and Cameroon. The project's goals were to: 1) develop a toolbox for identifying tenure issues that impact FLR adoption and food security, and 2) produce data to inform legal reforms supportive of strengthening customary tenure. The panel session has two parts. Part I focuses on the links between tenure security perceptions and FLR adoption, with particular attention to implications for local livelihoods. The first presenter explores these links for Cameroon; the second presenter examines them in the context of Madagascar. The third presenter provides a cross-cutting gender analysis of these themes for the two countries. Part II explores the

impacts of FLR on livelihoods in Madagascar and Cameroon. The first presenter shows that large-scale FLR in the Madagascar study site has negatively impacted people whose livelihoods depend on cattle production, while benefiting elites with the capacity to engage in charcoal markets. The second presenter reveals a disconnect between the ecosystem-focused goals of FLR projects and local livelihood needs, values, and FLR preferences. The third presenter demonstrates that FLR activities in the Cameroon study area have done little to address food insecurity. The fourth presenter wraps up the session with an overview of the project's Tenure, FLR, and Livelihoods Toolbox, which practitioners can use to identify tenure challenges to FLR implementation and local livelihood needs and preferences regarding FLR approaches. Overall, the session highlights the need to design FLR projects in close collaboration with local people rather than imposing locally inappropriate and often inequitable and socially unjust project designs.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Funding fads and donor interests shaping 30 years of international conservation funding in Madagascar

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Abstract

Tens of billions of dollars in official development assistance (ODA) have been spent over the past three decades to address the increasingly rapid loss of biodiversity globally. Despite this expenditure, however, detailed knowledge of who has provided these funds and who has used them, for what purpose, where, why, and with what effect within aid-receiving countries remains surprisingly limited. To address this gap, we apply a mixed-methods approach to map, categorize and analyze international aid for biodiversity conservation to Madagascar, a high priority country for biodiversity. We find a decline in overall biodiversity aid to the country between 1990-2018, punctuated by clear drops during times of political unrest. Funding flows were marked by periods with distinctive emphases, from protected areas to community involvement, to creating market-based incentives for conservation. These patterns reflect key donor interests and quantitative funding results resonate with the views and perceptions of conservation practitioners on the ground. Conservation professionals highlighted how increasing administrative short-sightedness and power structures shaping conservation aid allocation has led to difficulties in finding funding for basic operational costs and the increasing "projectification" of the conservation sector. Our findings demonstrate how systematic examination of the flow of international aid within countries over time can reveal the interests and power relationships of the stakeholders involved. They also hold

relevance for future biodiversity funding decision-making in Madagascar and elsewhere, particularly given major new funding commitments under the Kunming-Montreal Global Biodiversity Framework.

Primary FLARE Theme

Forest conservation: commons and contestation

190

Collapsing community conservation groups: Lessons from collaborative forest management around Mabira forest reserve, Uganda

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Abstract

Most scholars agree that local communities support and involvement in forest resources management is essential in achieving sustainable forest management and improving local livelihoods. Uganda adopted Collaborative Forest Management (CFM) as mutual benefit platform to engage local communities in forest management through CFM groups also known as Community Forest User Groups (CFUG) for the last 15 years. As an approach to community conservation, it is crucial to explore its implementation dynamics to draw lessons that would feed into furthering forest conservation and management in Uganda and beyond. To address this, we conducted a study around Mabira forest reserve on two CFM groups; Nagojje Community Biodiversity Association (NACOBA) and Conserve for Future Sustainable Development Association (COFSDA). The methods used in data collection were semi structured questionnaires, key informant interviews and focus group discussions. The analysis showed that both CFM groups experienced a steady decline in group membership right from the inception of CFM arrangement around Mabira Forest Reserve. CFM group members attributed membership decline in CFM groups due to failure by National Forestry Authority (NFA), the state agency to implement the CFM agreements especially on benefit sharing, power and rights to forest resources. Environmental Justice demands the right to participate as equal partners at every level of decision- making, including needs assessment, planning, implementation, enforcement and benefit sharing. We conclude that the collapse of the CFM arrangements could be attributed to the inability of NFA to consider the three principles of environmental justice (distributive, procedural and recognition domains) which are crucial in building effective CFM institutions for collective action in light of growing pressure on the forest commons.

Key words

Community, Conservation, Forest management, groups, Membership dynamics, Environmental justice, Mabira, Uganda

Primary FLARE Theme

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Impact of tree planting and agroforestry on the livelihoods of local communities in the commune of Yoko in Cameroon

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Abstract

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Abstract

In order to mitigate the perverse effects of anthropogenic activities on natural forests, a common commitment to restore degraded and deforested lands has been made by several African governments. This commitment is associated with the need for ways to improve the livelihoods of dependent populations on forest resources. This article studies the impact of tree planting and agroforestry practices on the livelihood of local communities in the commune of Yoko in Cameroon. The data used for this study were collected in two phases. 20 villages were targeted for the first phase in the said commune and in each of them, one focus group discussion and 20 household surveys were conducted. In total, 239 households were interviewed. Then, an in-depth phase was organized with focus group discussions (6) and key informant interviews (20) in 6 villages out of the 20 from the first phase. This study shows that food insecurity affects 60% of households. This situation is mainly due to lack of money to buy food products (44%) and low agricultural production (27%). The results also showed that tree planting and agroforestry are among the livelihood activities carried out by households (82% and 36% respectively). The statistical tests carried out did not show any significant link between agroforestry and food insecurity of households (p-value=0.2248). On the other hand, these tests show that most of the households planting trees are food insecure (p-value=0.0012). Consequently, the contribution of tree planting and agroforestry to the livelihoods of local communities in Yoko remains low. This contribution can be increased by the adoption of innovative value chains approaches including the training of farmers on the use of improved agro-sylvopastoral techniques from the planning to the implementation phases. McLain&Larson_Panel

Keywords: Households, Tree planting, Agroforestry, Forest Landscape Restoration, Livelihoods, Local communities.

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Restoration Education – Transformative education and engagement for biodiverse landscapes

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Abstract

We share an initiative in *Restoration Education*, that aims to integrate landscape restoration into formal academic and vocational education in Africa. The initiative builds on the international momentum created by the launch of the United Nations Decade on Ecosystem Restoration[1] in June 2021, which has spurred investment in landscape restoration. While investment has led to an increased number of restoration projects across continent Africa, it also created awareness that there is a shortage of well-trained professionals to implement restoration. Whereas forest management is a well-established educational domain, the concept of forest landscape restoration, which connects multiple disciplines within environmental and social sciences, is relatively new. To build a new generation of 'restoration professionals', a group of African education institutes, Wageningen university & Research, together with the Global Landscapes Forum and IUFRO launched a *Call to Action*[2] to develop inter- and transdisciplinary restoration related curricula across the African continent. Outcomes of this process that will be presented for Diuscsison are:

1. A coherent set of principles on landscape restoration, supported by a conceptual landscape framework and the learning outcomes of a Restoration Education curriculum.

2. A corresponding set of capabilities and skillsets needed for restoration professionals to restore degraded landscapes in Africa.

3. A blueprint for a transformative Restoration Education curriculum, based on existing courses and complemented with innovative modules, short courses, summer schools and practicals to be delivered in a blended learning format.

4. The underpinning inter- and trans-disciplinary theoretical and conceptual frameworks, captured in a scientific paper *'Educating a new generation of restoration professionals: insights from interuniversity Restoration Education in Africa',* which we would like to share and peer review.

[1] UN Decade on Ecosystem Restoration, information to be found on UN Decade on Restoration

[2] Restoration-Education-–-A-Call-to-Collective-Action.pdf (globallandscapesforum.org)

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Interdisciplinarity provides insights into governance challenges for forest restoration

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Abstract

Restoring ecosystems, and forests in particular has become a global priority. Forest landscape restoration aims to reconcile the needs and priorities of multiple stakeholders and in doing so, raises several governance challenges. Approaching governance in the context of forest restoration through an interdisciplinary lens provides a complex picture that reflects the multiple facets that impact on forest restoration. Under a Velux Stiftung-funded projects on governance and forest restoration, we formed an interdisciplinary panel of 14 experts bringing together individuals from a broad range of social (e.g., geographers, economists) and natural sciences (e.g., ecologists, foresters) all involved in some way with forest restoration. Through a collaborative exercise we discussed governance definitions and governance challenges and solutions in the framework of forest restoration. Our divergent disciplinary backgrounds and experiences led to a much more comprehensive overview of governance challenges and possible governance solutions for forest restoration. Focusing down on a specific governance challenge, namely balancing global and local benefits of forest restoration, serves to demonstrate the complexity and value in approaching these challenges with an interdisciplinary perspective. The outcomes of this exercise are presented here and include influencing intermediaries (brokers that sell trees or carbon) so that their "offer" is more socially and ecologically suitable; the importance of organizing (and building capacity) among local actors so that they can be a more powerful actor; emphasising multi-objective approaches that include both global and local outcomes; inclusive planning; agroforestry as an interesting option that can reconcile short term local needs with long term global benefits; and building strong and fair benefit sharing mechanisms. In addition, we reflect on the process of bringing different disciplines together to tackle this "wicked" problem and conclude that it presents multiple opportunities to take a more multi-faceted approach to these challenges, and to provide more comprehensive solutions, including by leveraging the multiple and diverse (but complementary) networks of each actor and their disciplinary communities of practice.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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How deforestation-induced local and regional climate changes affect agricultural production in the Brazilian Amazon

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Abstract

Scientists recently revealed that global climate change was the main driver of the 2024 drought, the worst drought in the Amazon over the past half century. This condition became about 30 times more likely than if El Niño alone were acting. The devastating impacts fell especially on agribusiness. Agribusiness' losses across the country amount to 11.8 million tons of soybeans for 2023/2024 harvest, resulting in an economic cost of UD 5 billion in addition to a 10% reduction in the corn harvest, which is tantamount to USD 2billion. The state of Mato Grosso, Brazil's largest grain producer, has faced the biggest soybean harvest failure recorded in its history. However, the disaster is not just a result of global climate change and El Niño. Deforestation has intensified climate risks for agriculture by directly impacting the local and regional climate. We analyzed the impacts of local and regional climate change resulting from Amazon deforestation on agricultural outputs in the region over the past two decades, focusing on soy, maize, and pasture productivity. Additionally, we also assessed the potential benefits of large-scale Amazon reforestation for restoring local and regional climate patterns. In sum, by quantifying environmental and economic impacts resulting from Amazon deforestation, this research aims at fostering strategies, public policies and climate litigation actions that could influence and hence change behavior of major stakeholders and policy makers towards the conservation of the Amazon Forest, given its key role in sustaining agribusiness's productivity in Brazil.

Primary FLARE theme?

Forests and trees in a just climate transition

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Livelihoods in flux: How forest management for conservation and timber has transformed communities in Mexico

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Abstract

Whether for their natural resources or their conservation relevance, forest commons have long been a contested target for incorporation into diverse management regimes that have directly and indirectly reshaped how they are used and valued. In the case of Mexico, state-led forest concessions and

protected area designations have given way to more devolved approaches, where communities voluntarily establish timber management programs that adhere to state regulations and incorporate their conservation areas into a national registry. Meanwhile, communities have increasingly embraced payments for ecosystem services (PES) and, more recently, forest-based carbon offsets (FBCO) schemes, where governments or private parties make annual payments in exchange for the preservation of actively managed forests. These forest management and conservation policies are being pursued at the same time and often within the same territories, which conveys a vision for forests from which local and national utilities can be extracted without diminishing their total extent. Here, we use a multiscale and multidisciplinary approach to examine who is collecting these utilities and who is bearing the costs. At the national level, we find that past PES participation is associated with increased timber production in the present, and with voluntary protected area designations to a lesser extent. A case study in two communities in Oaxaca further shows that many of their members find the requirements of timber authorizations, PES and FBCOs largely indistinguishable and compatible with conserved areas. Good news for those ideal productive yet preserved forest commons. However, these same participants raise important questions around food security and sovereignty, as agricultural land is increasingly displaced by forests that must serve a multitude of new goals. They also reveal incompatibilities between established communal governance institutions based on mandatory community service and the entrepreneurial structures that would be required to successfully manage a forest-based business. Whether they are selling timber, ecosystem services, or FBCOs, new financial and labor considerations have transformed Mexican communities' livelihood strategies. This study answers a growing call to consider context and power dynamics when evaluating the effects of forest policies, particularly in light of the populatiry of schemes promising win-win solutions for conservation and development.

Primary FLARE Theme

Forest conservation: commons and contestation

Student Level

Ph.D.

198

Stakeholder-driven wetland and riparian forest restoration in a deforested landscape in Sweden

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Abstract

Through government funded subsidies and advisory measures rural landscapes in Sweden were transformed, during the previous century, from being rich in wetlands and wet forest to effectively

drained landscapes suited for modern agriculture and forestry. Only 3% of the wetland area remained at the end 20th century. In view of ongoing climate change and biodiversity degradation, current Swedish Parliamentary Environmental Objectives and EU regulations aims to restore and re-wet the landscape. This, however, has largely been driven as a top-down, and rather fragmented and slow, process. As, in practice, any major landscape modification is dependent on the land owner/user's willingness to change, more inclusive bottom-up approaches are likely needed to achieve lasting change at scale.

We use the Tullstorp river catchment area, southern Sweden, as an example of a successful land owner/user driven landscape restoration. The Tullstorp River Economical Association has, in a previously open agricultural landscape, restored habitats and multifunctionality through 40 constructed wetlands, re-meandering of a river and the re-establishment riparian forests and grasslands.

Based on semi-structured interviews with stakeholders i.e. landowners, project managers, representatives of the County Administration and the Swedish Agency for Marine and Water Management we identify drivers for farmers/landowner's participation as well as for Tullstorp Project success.

Keys to the project's success were that it: 1/ was a project driven by the landowners/users utilising their local knowledge of land-use history, agriculture and environmental conditions, 2/ based on voluntary actions where landowners adapted land management to climate change and environmental challenges through: a/ a systems perspective on the possibilities of the catchment area, b/ a democratic organisation for joint decision making, and c/ with a democratic leadership identifying and using knowledge and ideas amongst the stakeholders.

The officers working at the regional water management level emphasised that rewetting initiatives need to come from the landowners as ideas and action plans are place specific. The existing formal Water Councils often lack this practical knowledge as well as a functional systems perspective. The Tullstorp Project has developed into a general practical model for restoration project transferable, with only minor adjustments depending on local conditions, to other areas.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

199

Long-term changes in land cover, floristics, and structure of Mpanga Central Forest Reserve: facts from remote sensing and observational plots and their relevance for forest ecology and management

Joseph Bahati, Enock Ssekuubwa, Simon Peter Ogola, Yabezi Banana-Abwooli, Daniel Waiswa

Abstract

Despite the importance of tropical forests for carbon storage and biodiversity conservation, they are threatened by degradation and deforestation. Monitoring of the remaining forests can help detect

adverse anthropogenic disturbances and assess the magnitude of forest alteration. Few studies examine long-term changes in tropical forests. Using data from remote sensing (1990-2022) and plot inventories (1994-2023), we sought to examine long-term changes in land cover, floristics, structure and human activities in Mpanga Central Forest Reserve. Landsat TM and Landsat OLI satellite imagery datasets were accessed from usgs.com and processed in programming interface on the GEE platform. Inventory data (tree species, diameter, and height) were collected using 30 circular plots. Plot conditions (undergrowth, canopy cover, and dead wood) and human-induced disturbances were recorded. Remote sensing showed an increase in settlements and cultivated land, and a decline in natural forest and shrubland. Inventory data showed that tree species composition shifted due to a decline in relative abundance of dominant species. Species richness and structure (stem density, maximum height, basal area, and aboveground biomass) declined. Human activities like cutting of saplings and mature trees increased. Undergrowth density increased while canopy cover and dead wood declined. Tree species used for drum making showed disrupted population structures so their long-term survival is not guaranteed. These changes in land cover, floristics and structure affect ecosystem services and wildlife through reducing forest productivity and habitat availability. In order to recover the historical conditions, the forest could be restored through assisted natural regeneration and active restoration involving native species. The density of preferred tree species can be increased through enrichment planting within the forest. To reduce the pressure on the forest, domestication of preferred tree species through on-farm planting and farmer-managed natural regeneration need to be promoted in forest adjacent communities.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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How to define and measure substitution effects in bioeconomy: A scoping review

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Abstract

Substituting fossil-based resources for bio-based ones can help reach climate mitigation goals. The ongoing discussion regarding transitioning toward a sustainable bioeconomy demands analyzing the effect that such substitution has on sustainability goals, as evidenced by a vast of number of existing scientific publications on this topic. This review, following the PRISMA extension for scoping reviews, documents the definitions and methodological approaches for substitution effects within bioeconomy. Peer-reviewed literature was searched for using databases from *Web of Science* and *Elsevier´s Scopus* and following an iterative identification process, fifty-seven articles were selected for in-depth analysis. We extracted definitions of substitution effects and identified a strong connection to woody biomass

through material and/or energetic substitution. Our results also show a core of European clusters (authors, institutions, and scope) most active in the field of substitution effects. We also extracted information on methodological approaches for quantifying substitution effects. Forestry biomass was investigated in 89% of the studies, thus revealing that wood products are often connected with lower fossil-based emissions. It was noticed that 53% of the studies consider material and energetic substitution through fossil by biomass substitution. Our results show that Life Cycle Assessment methods are used in 38% of the studies analyzed while the remaining studies focus on diverse environmental, economic, and social approaches. Construction, energy, and forestry account for 82% of the sectors in which substitution effects were analyzed. Moreover, 53% of the studies used displacement factors as the metric to assess the efficiency by which biomass use reduces emissions while a significant number of studies (79%) focus on indicators related to climate change mitigation, e.g. CO_2 emissions. Our results reveal that existing scientific approaches offer a wide spectrum of possible methodological combinations, from different disciplines, for developing and implementing monitoring frameworks relative to the reliance on a single method or type of biomass. The findings of this review will be used to develop an assessment framework for substitution effects within the German Bioeconomy Monitoring in order to monitor the development regarding the substitution of fossil resources through bio-based materials.

Primary FLARE Theme

Forests and trees in a just climate transition

203

What's in a "decade"? Competing discourses for ecosystem restoration in social media an implications

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Abstract

Ecosystem restoration is a key environmental policy goal of the contemporary era. Yet, what "restoration" means and how it should be pursued remains an object of debate. This study examines the nature and dynamics of restoration discourses in contemporary environmental communications on social media, focusing on Twitter. We use machine learning-powered text analysis of about 500,000 tweets spanning 2015 to 2022 and apply a critical discourse analysis to four main restoration terms – *landscape restoration; forest and landscape restoration; ecological restoration; and ecosystem restoration.* Findings reveal both ecological/environmental and human-centered framings, yet ecological concepts are more prominent, and both sets of discourses are wrapped as what restoration can/should deliver. Other distinct discourse formations convey promotional efforts, momentum building, and political engagement by proponent actors. A wide diversity of environmental policies is framed through

the language of restoration, underscoring its power in building public appeal and legitimacy for different institutions. Only a few discourses feature quick fixes such as tree planting, suggesting that contemporary restoration interventions are far more diverse than headline-grabbing targets to plant trees. There is little discussion of rural livelihoods, tenure rights, or tradeoffs between environmental objectives and local needs in landscapes where interventions are implemented. Some discourses are shared across two or more restoration terms while others are unique to a single restoration term. Shared discourses across the restoration terms include those fostering landscape scale and large scope of restoration as well as those articulating expected environmental benefits/outcomes of restoration (albeit different), while unique discourses include appeal to the youth and strategic branding. We discuss how restoration discourses carry different worldviews with implications for the purported socio-ecological wellbeing benefits of restoration. Despite progress in highlighting local needs in restoration discourses, limited attention to risks and tradeoffs points to a risk of uneven and negative outcomes as interventions are rolled out. Methodologically, our work shows how data-driven analysis of social media can shed light on the nature and development of restoration policy agendas and their nuances through discussions of a broad spectrum of social and policy actors in the international arena.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Building a restoration social science for creative sustainability transformations

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Abstract

Forest and landscape restoration has become a key global environmental policy objective. We argue that contemporary discourse of restoration has potential to generate a fundamental shift in environmental thinking, one with deep implications for human well-being and sustainability. Most researchers – social and natural alike – recognize that restoration is not, and cannot be, a return to a previous "natural" state. We suggest, instead, that ideas restoration can be viewed as an invitation to envision and create new futures. Embracing this possibility requires a new paradigm of thought, which moves from notions of sustainability and continuity to understanding the processes and conditions involved in achieving human-environmental transformations. We identify five established fields of social science analysis that, brought into cross-disciplinary engagement, can serve as a foundation for a social science of restoration: environmental history, science & technology studies, political economy/ecology, land systems science, and theories of governance. We discuss how such analysis can advance already well established natural science understandings of restoration to expand the horizon of societal action.

Such a restoration social science, we argue, can help us to better grapple with the complexity of human environmental relationships in our human dominated world (the *how* or restoration) and serve as a compass to clarify desired normative objectives (the what restoration should seek to achieve).

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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The effectiveness of performance payments for agroforestry in the Ivorian cocoa sector

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Abstract

Payments for environmental services (PES) are a common tool to incentivize pro-environmental behavior. However their effectiveness and equity outcomes are varying across contextual features, the ES provided, and design features of the payment scheme. We study the impact of a performance payment for tree planting on cocoa farms in Cote d'Ivoire, the world first cocoa producing country, which has lost the almost entirety of its tropical forests and where a transition from cocoa monoculture to cocoa agroforestry has been individuated as a solution to deliver climate adaptation and preserve biodiversity. Understanding the functioning of PES is also key to designing effective policies to promote ES provision across contexts and domains. We conduct our analysis on primary data from over 1500 households in a quasi-experimental setting in which PES were offered based on farmers' supply chain linkages to a cocoa buyer rather than targeted to biophysical, farm or household related features. We account for farmers' adverse selection by estimating the intent to treat effects using on a novel spatial difference in differences approach where the counterfactual is built within and outside treated villages and across farmers selling or not to the buyer offering the PES. We test the parallel trend assumption across treatment and control building placebo tests using randomization inference. Our contribution is threefold: first we present the first independent assessment of performance payment for agroforestry in the West African cocoa sector. Second, we highlight the mechanisms underlying the impact of PES and the lack thereof, with a particular focus on behavioral drivers and farm and household level constraints. Third, we evaluate outcome spillovers whereby increased tree planting may coexist with or disincentivize transplanting of native wildlings, or the maintenance of native trees.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Can improved tenure security for local communities boost forest land restoration initiatives and livelihoods in Cameroon?

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Abstract

African countries have committed to restoring 113 million hectares of degraded lands and forests by 2030. Although several such initiatives are taking place on the ground, persistent concerns remain unsolved, including how the land governance system(s), and particularly tenure, affect motivations to adopt forest landscape restoration (FLR) practices. A related concern is how FLR affects livelihoods in rural areas and land rights of local users. This article assesses the influence of land tenure on FLR and livelihoods for local users in the communes of Yoko and Dzeng in the humid forest zone of Cameroon. The data used were collected through a participatory action-research project led by the Center for International Forestry Research in Cameroon (and Madagascar), for "Securing tenure, forests and livelihoods". During the first phase (April-May 2022), in Cameroon, 479 households were interviewed in 40 villages (20 per commune). In the second phase (May-June 2023), in-depth data were collected through focus group discussions in 12 villages (6 per commune) with local peoples and migrants, including women and men. Field visits were also organised with the users during the second phase to evaluate FLR practices. In addition to chi-square tests, correspondence analyses and co-inertia analyses were performed. Findings suggest that tree planting of any kind and agroforestry practices are influenced by perceptions of tenure security in both communes. In brief, tree planting and agroforestry were more likely to occur on lands where users perceived that they had secure tenure (78% and 82% respectively), with most of them found in the national domain. We also found that local people plant food trees in the State private domain as a strategy to reinforce their claims on land, using mostly unsustainable clearing methods. This finding emphasizes the need for ways to improve user rights in local villages and to foster the alternative farming systems to the slash-and-burn practice that degrades the remaining forests. Overall, strengthening land user rights will surely be instrumental for FLR practices in Cameroon, but livelihoods options should be considered in sustaining the related investments. McLain&Larson_Panel

Keywords*: Agroforestry, Degraded land, Local users, Tenure rights, Tree planting.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Employment indicators relevant to the forest sector labor market: A scoping review on data and its measurement approach

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Abstract

Worldwide, many households rely on forests for their livelihood, including through forest-based employment. Yet, data regarding the scope of forest employment remains rather limited, and estimates of the number of people employed in the forest sector vary significantly depending on the data sources and methods used. Moreover, there is a lack of reliable data on indicators measuring working conditions, although in many countries, workers in the forest sector face several decent work deficits. To improve the availability of accurate, internationally comparable data on forest employment, this paper explores the status of existing data and its measurement approaches at the country level. The case studies focus on two countries in which the forest sector significantly contributes to the national economy, but different levels of data on forest employment indicators are available. A systematic scoping review is used to provide a comprehensive overview of current data on the number of people employed and the working conditions in the forest sector of the two countries. It further assesses the approaches that have been adopted to measure each employment indicator. To enhance transparency and minimize bias in literature selection, the review process and a specific protocol are formalized following the RepOrting standards for Systematic Evidence Syntheses (ROSES). The findings of the review will serve as a basis for dialogue with local sectoral and statistical stakeholders to identify and address the challenges and opportunities in collecting and reporting employment data relevant to the forest sector. Bolstering internationally comparable employment data contributes to the improvement of our understanding of forests' socioeconomic benefits and supports achieving more decent working conditions for the forest-related workforce.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

214

Digital Decentralization for Conservation: Blockchain's Potential in Deforestation Reduction and Transparent Supply Chains

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Abstract

The ongoing challenge of global deforestation, largely driven by agricultural expansion, presents a critical threat to the sustainability of ecosystems and the communities reliant on them. This issue is particularly pressing in the context of commercial agriculture's significant role in forest degradation. Our research focuses on addressing this concern through the lens of innovative solutions, particularly examining the potential of blockchain technology to improve forest management and supply chain practices. Traditional approaches, such as certification schemes, have struggled with issues of data traceability, transparency, and inclusivity, often failing to account for the diverse cultural and policy environments in which they operate. Our study investigates how blockchain technology can refine these systems, enhancing traceability, transparency, and inclusivity, especially for smallholders. We explore blockchain's potential to facilitate efficient cross-border implementations and address the problem of leakage in zero-deforestation commitments. Our findings highlight that while blockchain platforms share a decentralized foundation, they are not uniformly effective, with significant variations in their environmental and social impacts. The application of blockchain in zero-deforestation initiatives introduces its own set of challenges, including technological limitations, regulatory barriers, and the necessity of robust data systems. Our study contributes novel insights into the application of blockchain technology for forest conservation. It underscores the need for a critical assessment of blockchain's promise and pitfalls, urging stakeholders to carefully evaluate its social, economic, and environmental implications. As emerging technologies such as blockchain reshape our engagement with the natural world, it becomes crucial to actively comprehend, experiment with, and guide these evolving connections towards a harmonized and sustainable future for humans and nature.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

216

Turning the deforestation tide? Lessons from the Xingu Seeds Network on the potentials and challenges for landscape restoration in Brazil

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Abstract

Tropical deforestation remains rampant despite growing public attention and international pledges to address it. Much of it is connected to the supply chains of internationally traded commodities such as beef and soy, where efforts tend to be limited to "do no harm" policies such as environmental due diligence or zero-deforestation commitments. Yet, to turn the tide of ecosystem loss – and, in the Amazon's case, distance it from a tipping point – restoration is essential. Here, we draw lessons from the 15 years of experience of the Xingu Seeds Network in Brazil, an association of community groups who collect, store, and sell native seeds. Most importantly, the Network provides landscape restoration services to state agencies and large-scale (e.g., soy) farmers interested in – or legally obliged to – restore cleared areas. Such work, however, is mired in challenges. We conducted 25 interviews with key stakeholders over two fieldwork periods in Brazil in 2022 and 2023 to understand those challenges and ways forward. Our findings show that, although promising as way to foster sustainable livelihoods and restore landscapes, seed collectors' work is insecure, supply (of seeds) exceeds demand for restoration services, and policies to induce more restoration are either lacking or poorly enforced. The results expose how lack of due implementation of Brazil's Forest Code has meant negligible demand for landscape restoration services despite a glaring need for it in the Amazon and Cerrado ecosystems. Moreover, they reveal a gap in international policy-making about landscape sustainability and agricultural supply chains. We provide specific recommendations for how such gaps could be filled in this UN Decade of Restoration (2021-2030), both in Brazil's domestic policy and in demand-side measures that could do more than just arrest deforestation, but effectively turn the tide and help restore those ecosystems.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Knowledge, power, and (de)coloniality in conservation and development interventions in northeastern Madagascar

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Abstract

As global demand for biodiversity conservation and carbon sequestration continues to rise, it is crucial to address the fact that forest conservation costs are primarily borne by people residing in forest frontiers. It is increasingly recognized that bringing together different types of knowledge, such as scientific, Indigenous, and local knowledges, is needed to understand and address this complex trade-off between forest conservation and local people's well-being.

The northeastern region of Madagascar has long been recognized as one of the world's "hottest biodiversity hotspots", resulting in numerous conservation and development initiatives (CDIs). However, many of these initiatives have been perceived as ineffective in halting deforestation. So far, they also have shown limited effects on local people's well-being and some even have faced criticism for contributing to social injustices.

This study explores how current CDIs in the region operate, aiming to learn from their experiences as a first step to co-designing pathways towards more just and sustainable forest conservation. Through a qualitative approach, we delve into the perspectives of actors involved in five CDIs, including project staff at different hierarchical levels, as well as project beneficiaries. Based on our analysis, we reflect on the role of different types of knowledge in the design and implementation of CDIs. Additionally, we examine issues of power dynamics and actor inclusion/exclusion within these initiatives.

The findings of this study not only have direct implications for the CDIs involved but are also relevant for similar initiatives implemented in forest frontier contexts elsewhere. The study contributes to the reflection on the ways predominantly internationally driven projects are designed and implemented in the Global South. Such reflections are urgently needed for decolonizing conservation and development actions and reorienting them towards more sustainable and equitable pathways.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

220

Plural Values of Tropical Restoration Sites: Evidence from the Albertine Rift Region

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Abstract

Forest landscape restoration is a global priority, as the United Nations Decade on Ecosystem Restoration indicates. 61 countries have pledged to the Bonn Challenge, signaling their formal commitment to regenerating forests, improving rural livelihoods, and bringing huge swathes of degraded land into restoration. Yet, evidence mounts that tree-planting harms communities and puts tropical biodiversity at risk, where restoration campaigns target unsuitable habitats and ignore local people's complex interrelationships with their habitual places of residence. We address this concern, by tacking stock of tropical restoration sites' plural values in the Albertine Rift Region,

using Rwanda's Western Province as a case. Our study appraises rural people's lived experiences of restoration in a fragmented, afro-montane forest landscape, to reveal how and why different intervention types generate beneficial and detrimental contributions to their everyday lives and livelihoods. Using photo-voice as our primary research method, we draw from focus group discussions and photo-based qualitative interviews, i) to discern residents' gendered experiences of restoration in the study area; ii) to disentangle the bundled contributions that different actors derive from restoration sites; and iii) to evaluate how research participants' *context-specific* classifications of benefits from forest landscape restoration differ from IPBES' *generalising* perspective on restoration's contributions to people. Advancing a social-ecological research agenda, our study responds to calls from the restoration social science community, for greater engagement with humanities and social science perspectives, to improve restoration-related forests and livelihoods research. Our adoption of photo-voice – a participatory, socio-cultural valuation method – aids an ongoing academic turn to innovative research approaches that empower diverse actors to share their plural perspectives on the benefits and burdens that arise from forest restoration. This matters, as it enables a broader portfolio of values being taken into consideration, when politicians and practitioners decide about the design, financing, and implementation of new landscape restoration initiatives. Our research thus ultimately supports decision makers in imagining socially and ecologically desirable alternatives to business-as-usual tree planting approaches. We challenge them to rethink outdated policies, and disincentivise restoration strategies that promise impressive results by common donor metrics but fail to deliver meaningful restoration outcomes for residents of tropical forest landscapes.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

221

Thermal effects of fragmented coniferous forests: a numerical simulation study

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Abstract

Forests can buffer the macroclimate and contain most of the diversity of terrestrial ecosystems, but insufficient understanding of the microclimate of fragmented forests can lead to huge biases in species distribution predictions, habitat identification, carbon sequestration calculations, and biodiversity research. Existing forest microclimate monitoring methods cannot effectively cover entire forest patches, limiting the quantification of forest thermal effects and the upscaling from small-scale climate patterns to large scale. Nowadays, cascading UAV Laser Scanner (ULS) data with multi-physics field coupled microclimate modeling proving a promising approach for quantifying spatiotemporal microclimate variations at the sub-patch scale. This study combined canopy information obtained by

ULS to simulate the temperature pattern within forest patches, as well as radiation, vegetation, air, soil, and soil surfaces driven by physical coupling processes. Our modeling results demonstrated good performance in predicting temperature dynamics within the forest and its surrounding environment (RMSE=2.73℃, R^2=0.84). Based on our simulation results, we identified several conclusions: 1) The temperature along the forest edge to the interior reveals two different cooling mechanisms on the upwind and downwind orientation. On the upwind orientation, the forest cooling law follows a power-like function. While, the forest cooling law follows an exponential-like function on the downwind side. 2) Vertical temperature gradients in forests are affected by wind speed and the asynchrony between radiation and macro temperature, showing different patterns at various spatiotemporal frames. 3) Contrary to common perceptions, forest patches show the warming result in the canopy wake zone. Due to the instability of the flow in the canopy wake zone, it leads to higher near-surface temperatures in open areas. These findings highlight the complexity of forest microclimates, providing a foundation for enhancing our understanding and for simulating microclimates at a landscape scale.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Master's

223

Scaling-up ecotones using unmanned aerial vehicle images and satellite data

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Abstract

Ecotones play an essential role in the study of landscape ecology functions, patterns, and ecological processes, yet they are often ignored in the landscape monitoring. Delineating ecotones using remote sensing technologies on both small and large scales remains a significant challenge. This study aims to address this challenge by upscaling ecotones through the integration of multisource remote sensing data, including ultrahigh-resolution RGB images, LiDAR, and satellite data. To achieve this objective, we first used the orthoimages and canopy height derived from UAV-LiDAR data to map a fine resolution landcover map with ecotones. Subsequently, this landcover map was used as the training sample for four machine learning models and selected the most efficacious model as upscaling model. The satellite data, encompassing Synthetic Aperture Radar (SAR; Sentinel-1), multispectral imagery (Sentinel-2), and topographic data, functioned as explanatory variables among all these models. Finally, we map the landscape pattern with ecotones in 2017 and 2023 based on the upscaling model and compared the difference between the two years. The results revealed that ecotones acted as buffer regions, effectively smoothing the "terrain barrier" and reducing the contrast between adjacent landscape elements. Furthermore, the RF model performed the best among the four models (kappa coefficient = 0.76).

Within this model, spectral-related variables emerged as paramount, with the red band, shortwave infrared band, and vegetation red edge band being identified as the three most important variables. This underscores the critical importance of spectral data over Synthetic Aperture Radar (SAR) data when upscaling ecotones for broader, landscape-scale analysis. The comparative analysis between 2017 and 2023 indicated a 2.08km^2 increase in ecotone areas, primarily attributed to the contraction of grassland, suggestive of constantly ecosystem recovery. Our results demonstrated the efficacy of combining UAV imagery with satellite data for accurate large-scale ecotones detection. This upscaling model bridge the gap across different scales and enriching our understanding of the intricate relationship between ecological processes and the evolution of landscape patterns.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

226

Why restore? Perspectives of landholders in Brazil's Atlantic Forest

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Abstract

Countries have committed to restoring landscapes on a large scale globally, with little insight into why people would engage with restoration programs and what their social impacts might be. This study focuses on understanding how landholders perceive restoration within individual farmlands in the Pontal do Paranapanema, a region within Brazil's Atlantic Forest. We document what drives smallholders to adopt agroforestry practices aimed at forest restoration and large landholders to engage in reforestation. We use mixed methods including surveys, semi-structured and key informant interviews. We find that small and large landholders engage with restoration for different reasons. Smallholders engage in forest restoration to diversify their income and for ecosystem services (e.g. shade), while most large landholders restore to comply with the environmental legislation. Smallholders and large landholders both perceived restoration initiatives as risky and expensive, but the nature of identified risks varied across landholder groups. Smallholders identified conflicts with grazing land, and strict bans on cutting trees as potentially affecting their flexibility over the land, while large landholders shared concerns about changes to environmental compliance over the years. Our thematic analysis

shows how the adoption, expansion, and abandonment of restoration initiatives are shaped by changing rules, uncertain land tenures as well as personal and professional preferences of landholders. We find that landholders who have not engaged in restoration are most likely to be attracted to initiatives that are compatible with their immediate needs and that can generate income. Financial incentives such as those associated with carbon markets could be better aligned with smallholder needs, as current carbon offset mechanisms in the region only suit large landholders. Formalizing land tenure and the development of mechanisms that support smallholders who want to restore may increase restoration uptake while the stability of existing environmental policy could encourage engagement by large landholders.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

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The Nexus Between Agroforestry Landscapes and Dietary Diversity: Insights from the Central Dry Zone of Myanmar

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Abstract

The United Nations promote agricultural intensification to achieve zero hunger and increase food production despite limited farmland resources. However, evidence on the necessity to cultivate a diverse range of subsistence and cash crops – to avoid agricultural expansion, maintain biodiversity, foster ecosystem services, and promote human well-being in the face of climatic stressors – is growing. Agroforestry has a key role to play in this context, as increasing tree-based food production can promote healthy and sustainable food systems. In Southeast Asia the potential of farm trees to advance agricultural production through ecological intensification, and their contributions to farmers' dietary diversity along multiple paths remains under-researched. We address these research gaps with a study of three common agroforestry species (Toddy palm, Jujube, and Thanakha) that are native and culturally important for residents of Myanmar's Central Dry Zone. Drawing on face-to-face qualitative interviews with 47 dryland farmers, we appraise i) the species' role in households' farming systems, ii) unravel their contributions to four dietary diversity paths, and iii) evaluate which drivers may alter their current place in the region's food systems and people's livelihoods. Our result show that all three species are well adapted to the region's harsh agroecological conditions. Fruits and other plant parts are directly

consumed by households, whereas crop production and livestock farming interactionsprovide indirect dietary diversification via the agroecology pathway. By-products of the agroforestry species are used as fuel in food processing and production. Income generated by trading agroforestry products enables access to additional food sources. Market instabilities, changing lifestyle and cash-crop booms affect Toddy and Thanaka production. Jujube, in contrast, substantially supports households' income. Policy and development actors should priorities maintaining the present agroforestry landscapes, to foster dietary diversity and avoid unforeseen knock-on effects from a loss of current tree resources. Farmers should be encouraged to maintain native tree species on their dryland farms, as our findings indicate that such an agroforestry-based strategy would help to enhance desirable dietary pathways and to set communities in Myanmar and similar ASEAN regions on the track of becoming food-secure – despite rapid demographic and social changes, and mounting climatic stressors.

Primary FLARE Theme

Beyond the forest: trees and human well-being from farm to city

Student Level

Ph.D.

229

Trees outside forests: What we know, what we think we know and what we don't know

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Abstract

Recently, land restoration has emerged as the leading natural climate solution (NCS) to mitigate climate change, while producing co-benefits to biodiversity and people's livelihoods. A plethora of tree planting programs aim to increase tree cover outside natural and protected ecosystems. However, the evidence on the production of co-benefits is sparse and at times, conflicting. In this talk, we present a secondary data analysis of the outcomes of trees outside forests (ToF), such as in farms, roadsides etc, in South Asia. We carried out a systematic literature review on the human wellbeing outcomes of 20 ToF practices, such as agroforestry, silvopastoralism, the use of live fences etc. Previous evidence points at a significant positive influence of trees on people's economic and material (fuelwood, timber etc) needs, but there is little to no evidence on other outcomes with respect to people's health, spirituality, and other aspects of their wellbeing. Moreover previous literature reviews have drawn on little to no evidence from several South Asian countries such as Bangladesh and Sri Lanka. In order to quantify the

lesser studied wellbeing outcomes of trees outside forests in South Asia, we screened 6000 articles and filtered 375 articles that met our eligibility criteria. We found that most studies focus on the material and economic outcomes, which are positively influenced when trees are planted outside forests. However, we also found that trees planted outside forests can increase conflict within local communities and negatively impact people's sense of agency. However, close to 80% of the studies reviewed were observational and without a comparator and 15% of the articles reviewed had conflicts of interest (e.g.: government employees as authors of a paper evaluating a tree planting program). Further, more local and less expansive ToF practices such as home gardens and alley cropping are important to promote tree species diversity in comparison with practices such as afforestation. Our review shows that using trees as a quick and easy solution for climate mitigation may not always produce win-win-win outcomes for climate, biodiversity and people. This body of work is crucial to guide restoration efforts in this UN Decade on Restoration.

Primary FLARE Theme

Beyond the forest: trees and human well-being from farm to city

235

Enhancing Forest Conservation and Livelihoods in High Forest, Low Deforestation (HFLD) Countries: evidence from Guyana and Suriname

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Abstract

Protecting forests in countries with high forest, low deforestation rates (HFLD) is crucial for combating climate change. These countries hold significant carbon stocks, making them pivotal for Natural Climate Solutions (NCS), which involve actions in agriculture, forestry, and other land use sectors aimed at conserving, restoring, and managing lands to enhance carbon storage and mitigate greenhouse gas (GHG) emissions. NCS also improve productivity, livelihoods, and well-being from sustainable natural resource management. NCS are key to meeting the Paris Climate Agreement goals by 2030 while contributing to the Global Biodiversity Framework, and the Sustainable Development Goals. However, understanding the connections between forest conservation investments and human well-being in HFLD countries remains limited. Our study addresses this gap by employing remote sensing data and quasi-experimental methods to assess forest carbon dynamics and identify effective land use options that bolster both livelihoods and forest conservation. Focusing on the Guiana Shield Ecoregion, where forest cover exceeds 80% of the land and deforestation rates are low, we quantify the impacts of national and regional programs, such as Guyana's Village Improvement Plans and Suriname's Sustainable Forestry Management, on forest maintenance and household socioeconomic status (SES). Through a comprehensive household survey spanning from 2021 to 2024, we develop a SES index and gather data on perceptions regarding governance, food security, and environmental changes from over 900

households across 45 villages. Our findings reveal nuanced variations in program effectiveness. While community-level benefits are evident, we stress the importance of tailoring interventions to diverse socioeconomic contexts within communities. We emphasize the necessity of equitable benefit distribution and robust governance structures for successful forest conservation initiatives. By comparing outcomes across countries, we discern actionable insights for policy refinement and implementation. This research contributes to bridging the gap in understanding the social impacts of NCS. Our findings underscore the key contributions of integrating social considerations into forest conservation efforts, providing valuable insights for policymakers and practitioners. By highlighting the necessity of tailored program designs that account for socioeconomic diversity and governance effectiveness, our study informs more impactful strategies for achieving global climate and sustainable development goals.

Primary FLARE Theme

Human well-being, poverty and forests

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Barriers and Opportunities for Collaborative Landscape Governance: Lessons from Ghana and Zambia

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Abstract

There is growing recognition global challenges such as biodiversity loss, climate change, food insecurity, and poverty are interconnected issues. This signals the need for a shift from conventional sectorial management to integrated solutions, and integrated landscape approaches (ILAs) are an opportunity in this regard. ILAs are broadly defined as long-term participatory processes for reconciling competing land uses for improved socioeconomic and environmental outcomes. ILAs are predicated on the assumption collaboration across scales, sectors, and diverse social groups can and will occur to achieve more equitable and sustainable landscape governance. Yet, there is little evidence showing if, how, and when collaborative governance occurs. This study explores the barriers and opportunities of collaborative landscape governance in Kalomo District, Zambia and Ghana's Western Wildlife Corridor. Both landscapes have undergone significant land cover change and rapid deforestation in recent years, making them a timely case study for assessing the potential of operationalizing ILAs. To understand the political ecological forces (such as power, scale, and other social constructs) that influence collaborative governance in each landscape, we conducted 78 in-depth, semi-structured interviews and 13 focus group discussions. Data collection took place at the community scale with community members and traditional leadership, and at the district and regional scales with institutional representatives such as NGOs, private sector, and government. Results from five months of fieldwork shed light on four key areas: a) stakeholder priorities in each landscape b) when and where collaboration is occurring to meet landscape priorities c) how power shapes these interactions; and d) the implications of these dynamics on collaborative processes like ILAs. Beyond ILAs, these findings contribute to the field of landscape

governance more broadly and can inform policy and projects that aim to engage multiple stakeholders with diverse priorities and positions of power.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

237

Long-term monitoring of honeybees (*Apis dorsata*) and community lead enterprise-based conservation in Western Ghats, India

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Abstract

Honeybees play an important role in the forest ecology of tropical forests, besides supporting the livelihood of the people. *Apis dorsata* contributes more than 80% to the total honey production in India. Populations are known to migrate distances of 50 to 100 km and forage around 200 species. The indigenous Soliga community harvests around 15 to 18 tons of honey per annum from the wild. Bee colonies were monitored before and after harvest from 1995 to 2019 (25 years) to determine the interannual variability in colony numbers. The highest densities of bee colonies were recorded in evergreen forests, followed by dry deciduous forests. The level of extraction was high in dry deciduous forests, followed by evergreen, and least in cliffs depending on accessibility. Results showed a gradual decrease in bee colony numbers from 1995 to 2019. Across the year, the overall number of bee colonies decreased in evergreen forests ($R^2 = 0.77$) and dry deciduous forests ($R^2 = 0.76$), which was significant. Bee colonies number remains more or less constant on rock cliffs ($R^2 = 0.24$).

Established decentralized honey processing units to provide livelihood security and conserve honeybees in the landscape through the participation of community institutions with tenure under the Forest Right Act 2006. The Forest Rights Act (FRA) of 2006 was used to empower forest-dependent communities with the right to access forests for their well-being. Our work has facilitated the provisioning of forest rights to 77 Gram Sabhas which include 83 villages and 5433 families with 21,732 members. Enhancing incomes from the sustainable honey harvest can help maintain local livelihoods and provide economic incentives for conservation. The project funded by the government of India, decentralized enterprise-based conservation models that led to an income generation of around 20,000 USD. The income was distributed within the community as an incentive for sustainable use. We found more ownership and inclusive participation in the decentralized processing units after the implementation of the Forest Rights Act 2006.

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Resisting Migration: Women's Engagement in Community Forestry in the Middle Hills of Nepal

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Abstract

Community Forestry (CF), Nepal's community-led forest management program aimed at supporting conservation and local livelihoods, has historically relied on rural women's contributions to forest management but overlooked their capabilities in forest governance. Today, women have more opportunities to step into key leadership positions as men increasingly migrate and leave their positions empty, yet women's ability and desire to do so may be diminishing. Studies demonstrate that migration often overburdens non-migrant women with added labor at home, reducing time available for CF. Further, remittances sent by migrants reduce household dependence on forest products and potentially reduce women's desire to invest time in CF. Therefore, migration is changing women's relationship to CF in complex ways, which has implications for the future of the program.

Using 2023 household survey and focus group data from Pyuthan and Salyan districts in western Nepal, I explore the impacts of migration on non-migrant women's time allocation and attitudes towards migration and CF. Findings demonstrate that migration amplifies women's subsistence and domestic workload while reducing their dependence on forests, yet their engagement in CF increases. Among other reasons, women report being motivated to transform the CF program into a lucrative livelihood alternative to migration. Therefore, CF has become an intimate part of women's resistance to what they perceive as 'forced' migration.

Although past studies have explored the effects of migration on women's engagement in CF, less is known about why, in a rapidly changing socio-economic context, women remain invested in the program. Therefore, this research contributes to feminist political ecology on the role of migration in women's changing relationship to forests. These findings also have practical significance to Nepal's CF program as they highlight the need to re-define the goals and opportunities in CF to better support local livelihoods and generate sustained community investment in the program.

Migration is changing the socio-economic conditions of rural, forest-dependent households globally. For programs like CF to succeed in conservation and supporting local livelihoods, the goals and priorities of the programs must be adaptive to the contemporary age of migration.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

243

Local perception of FLR: what do people hope to gain? A study case in northern Madagascar

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Abstract

Agriculture has long constituted the main livelihood activity of Malagasy people, but it is threatened by widespread land degradation. Madagascar's commitment to Forest Landscape Restoration (FLR) prioritizes increasing the productivity of degraded lands for socio-economic and environmental purposes. But what do the people affected actually expect from these initiatives? Since the 2000s, official restoration initiatives have been implemented in northern Madagascar, notably in the form of large-scale reforestation. Some people have benefited from these plantations thanks to new income opportunities from charcoal production, a new livelihood activity brought about by first state, then project-led reforestation. However, restoration promoters in the area often neglect or are unaware of existing traditional FLR-related practices, such as agroforestry and the planting of certain fruit tree species. The top-down approach adopted by reforestation projects means that they sometimes fail to achieve their objectives because they do not consult local communities and, as a result, promote FLR approaches and tree species that many locals do not want or cannot afford. Drawing on a household survey, coupled with focus groups and key informant interviews, our study in two communes in northern Madagascar seeks to understand the relationship between local livelihood activities and the adoption of FLR practices. Our study shows that the adoption of FLR practices is influenced not only by the land's biophysical characteristics and the temporal dimensions of its use, but also by the desire of rural people to ensure a supply of agricultural and forest products sufficient to meet their subsistence and income diversification needs. Rarely do locals invest in FLR practices solely to preserve ecosystem services. Our study highlights that FLR approaches, the species used in practice, and benefits perceived by locals are the main factors influencing the adoption of FLR. Beyond classic FLR initiatives, there are local practices that can reconcile environmental objectives and beneficiaries' expectations regarding livelihood needs. Recognizing the value of these local practices can improve the likelihood of success for FLR projects, insofar as they support the expansion of those practices rather than seeking to impose practices that may not fit with local values and needs. McLain&Larson_Panel

Primary FLARE Theme

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Resolving land tenure security is essential to deliver forest restoration

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Abstract

Tropical countries are making ambitious commitments to Forest Landscape Restoration with the aim of locking up carbon, conserving biodiversity and benefiting local livelihoods. However, global and national analyses of restoration potential frequently ignore socio-legal complexities which impact both the effectiveness and equitability of restoration. We show that areas with the highest restoration potential are disproportionately found in countries with weak rule of law and frequently in those with substantial areas of unrecognised land tenure. Focussing on Madagascar, at least 67% of the areas with highest restoration potential must be on untitled land, where tenure is often unclear or contested, and we show how unresolved tenure issues are one of the most important limitations on forest restoration. This is likely to be a bigger problem than currently recognized and without important efforts to resolve local tenure issues, opportunities to equitably scale up forest restoration globally are likely to be significantly over-estimated.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

246

Revealing recent deforestation trends and their complex social-ecological drivers in the buffer zone of Masoala National Park, Madagascar

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Abstract

Deforestation poses a persistent threat to remaining tropical forests in global biodiversity hotspots. In the north-eastern region of Madagascar, deforestation dynamics are predominantly driven by shifting cultivation and cash crop agriculture; the latter intricately linked to the global commodity trade. Despite numerous interventions, halting deforestation in the buffer zone surrounding Masoala National Park has proven challenging. Our study aims to elucidate recent deforestation trends and their underlying drivers in this critical area. Employing a multi-methods approach, we integrated visual interpretation of high-resolution satellite imagery with ground-truthing through field inspections of recently deforested plots. Additionally, we conducted nine in-depth focus group discussions across three villages, delving into the nuanced motivations and rationales guiding local farmers' decisions to engage in deforestation between 2017 and 2022. Contrary to a simplistic narrative of poverty as the primary driver of deforestation, our findings reveal a complex reality. The limited availability of agricultural land, exacerbated by extensive protected areas, intensifies competition among households for land access. Affluent households often control expansive agricultural territories, extending up to the boundaries of the national park. Consequently, impoverished households seeking to expand their agricultural activities are compelled to encroach upon forested areas. Furthermore, fluctuations in cash crop prices significantly influence land-use decisions. During periods of high prices, farmers seek to expand cash crop plantations, whereas during low-price phases, they resort to securing additional land for subsistence rice cultivation through shifting agriculture. Understanding these multifaceted drivers of deforestation is imperative for designing targeted interventions aimed at redirecting behaviors away from further environmental degradation. Moreover, considerations for compensatory measures for those most adversely affected are paramount. By shedding light on these complexities, our study contributes to ongoing discourse on effective conservation strategies, striving for equitable outcomes for both biodiversity and local communities.

Primary FLARE Theme

Human well-being, poverty and forests

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Two and a half decades of community forestry in central Africa: Lot of efforts for very poor impacts on livelihoods?*An assessment of 40 cases in Cameroon, Gabon and the Democratic Republic of Congo*

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Abstract

Implemented in Cameroon early after its adoption into the law, community forestry has attracted followers in Central Africa, particularly in Gabon and the Democratic Republic of Congo. As a system in which local populations are closely involved in the management of forest resources, community forestry is generally seen as having two virtues: (1) facilitating sustainable management of forest areas by communities, thereby maintaining forest cover; and (2) offering populations development options that would contribute to improving their livelihoods. Although the process is at different levels of implementation in these three countries, its effectiveness as well as its efficiency are today increasingly questioned. Therefore, the question we sought to answer in our study is the adequacy between the extent of the support provided and the efforts made at all stages of the implementation of the process, and the results obtained on the field, in terms of improving the livelihoods of local populations. We thus made a retrospective analysis of community forestry in Cameroon, Gabon and DRC, based on the situation of 40 community forests and 25 support organizations. In addition to literature review, interviews of about 1000 persons, and direct observation, we used technical tools to assess the impacts of community forestry on the forest cover. Our research shows that 1) More than half of the funds to support community forestry were spent outside the affected communities; 2) Impacts of community forestry on the livelihoods occurred one in three times at the best, and for a very short period. 3) Despite the differences in the levels of implementation for the three countries, barriers to community forestry are replicated from one country to another, preventing the success of the process. Beyond presenting more details on understanding the results of community forestry, considered mitigated by some works, our research highlights the fact that local populations are not actually the main beneficiaries of community forestry. It can be considered as a great contribution to understand the relationship between forest and livelihoods.

Primary FLARE Theme

Human well-being, poverty and forests

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To what extent do existing biodiversity conservation policies promote social and ecological justice in Indonesia's conservation areas?

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Abstract

Conservation areas are among the best options for conserving the world's biodiversity. Integrating ecological goals and social objectives into policy and management practices is necessary for sustainable and equitable conservation areas. There have been increasing calls to consider equity and justice in protected area governance to resolve the trade-offs between conflicting interests and stakeholders characterising conservation dilemmas.

Indonesia has set aside 22 million hectares of land, dominantly forested, as terrestrial conservation areas mainly purposed to protect its biodiversity. These areas are surrounded by nearly 6,400 villages

with an estimated total population of 16 million people. As elsewhere, conservation area management in Indonesia faces challenges in delivering both social and ecological benefits.

This study will carry out a qualitative content analysis of the ideas of justice represented in conservation area policy documents in Indonesia. Uniquely, we will draw on the literature on both social and ecological justice, examining how justice is framed in relation to both human and non-human beings. Our analysis will examine 28 prevailing laws and regulations at the national level, along with amendments, on conservation area management in Indonesia. We will explore three dimensions of justice: recognition, procedure, and distribution.

This study will be the first to examine notions of justice within Indonesian conservation and will advance the understanding of how justice is acknowledged and conceptualised within conservation area policy. From a practical perspective, our findings will contribute to a better understanding of Indonesia's current conservation area management policy in the conservation-justice discourse. This is an important step towards understanding how ideas of social and ecological justice can help navigate difficult trade-offs and inspire the future direction of Indonesian conservation area management.

Primary FLARE Theme

Forest conservation: commons and contestation

Student Level

Ph.D.

250

Forest Dependent Livelihood - a crucial part of the local community economy- a study in Dharamjaigarh forest division of newly formed Lemru elephant reserve, Chhattisgarh, India

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Abstract

The socio-economic and ecological systems have always been linked but with an interdisciplinary approach towards sustainability it is necessary to resolve the complex dynamic system of development, poverty eradication, and biodiversity conservation (Fisher & Christopher,2005). The present study is being conducted in the Dharamjaigarh forest division of the newly formed Lemru Elephant Reserve (LER). It attempts to study the relationship between the local community's livelihood, their dependence on forest resources, and the impact of wildlife through a participatory approach through interviews and focused group discussions. Forest contributes around 27% of household income for the communities

that live within or near forests (Razafindratsima et al.,2021) and the villages being studied lie in the proximity of LER. The communities living in these villages are a heterogeneous mixture of scheduled tribes (STs), scheduled Castes (SCs), other backward castes (OBCs), and upper caste populations, where STs are the majority. Most of the local populations live in poverty and rely on the surrounding forest for their livelihood; however, this relationship is also impacted by conflict with wildlife.

In the pilot study, it was found that 87.5% of the respondents were involved in Non-Timber Forest Produce (NTFP) collection. Agriculture is the primary source of livelihood activity, other means of livelihood include daily wage labour, rearing livestock, and work provided by the forest department. The average income obtained from NTFP in a year was 15158 rupees/$183.17 which is about 19% of the average total yearly income (80,000 Rs per year/$967). The daily average earning is 2.65$, which is less than the poverty line standardised by the World Bank in lower-middle-income countries as 3.65/day (304.85 Rs/ day). The issue of human-wildlife conflict is also critical as the livelihood of 87.5% of respondents was affected, making the community more vulnerable to poverty than its alleviation. The complex dynamics of the upward trend of population growth in India, and the human-wildlife negatively impacting the source of livelihood of forest communities, may bring about overexploitation of forest resources and further poverty. This underscores the need for an interdisciplinary approach towards understanding the relationship between economic growth, rural development, poverty alleviation and conservation.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

252

Addressing the challenge of identifying appropriate FLR approaches: Exploring differences in tenure (in)security perceptions and tree-planting rights for secondary rights holders in Madagascar

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Abstract

Whether locals perceive their land rights to be secure is a key factor influencing motivations to plant trees. Secondary rights holders, or individuals having access to use or manage lands owned by others, are more likely to feel insecure and thus less likely to be interested in investing in forest

landscape restoration (FLR). Moreover, secondary rights holders may not have tree-planting rights, thereby posing a challenge to FLR implementation. Understanding when secondary rights holders are likely to feel secure or to have tree-planting rights can help practitioners tailor FLR approaches appropriately. In this presentation we examine how perceptions of tenure (in)security for secondary rights holders differ depending on land use, types of rights held, and sex, and how those are related to FLR practices. Our analysis draws on data collected in Madagascar through a survey of 480+ households and 36 focus groups. Our results show that perceptions of (in)security did not affect FLR on savanna land unsuited for farming but did affect FLR on farmed parcels. Where land ownership was vested in the family group, individuals who held only use or management rights (for example, sons of the primary rights holder) sometimes perceived their tenure to be secure, depending on their status within the family and their sex. For family lands, secondary rights holders sometimes had the right to plant trees – again, depending on their status within the family or their sex. In some cases, the secondary rights holders could decide whether to plant trees; in other cases, the decision had to be made jointly with other family members. The implication for FLR practitioners is that it's important to understand how social relationships between secondary and primary rights holders affect perceptions of (in)security, rights to plant trees, and, therefore, what FLR practices are likely to be appropriate. It's also important for FLR practitioners to understand what FLR types are appropriate for which land use type. Being aware of which rights secondary rights holders have, and tailoring FLR approaches accordingly, will lead to greater uptake of FLR practices and more equitable distribution of FLR benefits. **McLain&Larson_Panel**.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

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Forest Landscape Restoration (FLR): What impacts on whose livelihoods? A case study in northern Madagascar

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Abstract

More than 70% of Malagasy people live in rural areas and depend on forests for their livelihoods. However, deforestation threatens the long-term viability of their livelihoods. Forest landscape restoration (FLR), which theoretically guarantees ecological sustainability while improving local livelihoods, is a promising solution. But what are the actual impacts of FLR? In Madagascar, FLR

initiatives have emphasized large-scale reforestation activities focused primarily on savannas, which are presumed to be vacant lands with no owners. In practice, savannas are rarely without owners but are managed by locals according to customary tenure. Since these savannas typically are unsuitable for farming, locals use them as grazing land for cattle, which are important both economically and symbolically in Malagasy culture. Through a combination of key informant interviews and participatory mapping, our research in Sadjoavato Commune in northern Madagascar allowed us to explore how FLR implementation over a large area transformed local livelihood options. Various reforestation projects have been implemented in Sadjoavato since the 1990s, primarily on land previously used for grazing cattle. Locals had rights to graze their cattle on these lands as well as rights to other resources to meet their subsistence needs. Subsequent to large-scale reforestation, cattle grazing is limited to those areas where trees were not planted, and charcoal and timber production have become important livelihood activities for some villagers. However, few livestock producers participated in the reforestation projects, and most of the reforested land now legally belongs to local elites or wealthy investors from nearby towns who have the capital to invest in charcoal and timber markets. Thus, our study shows that local livestock producers have lost access to their pastureland, with negative impacts on their livelihoods, while the new livelihood activities made possible through FLR have largely benefited local and outsider elites. A key message for practitioners is that FLR is neither socially nor economically neutral: some people win, and some lose when FLR projects are implemented. It is therefore important for FLR practitioners to identify how the benefits and costs of FLR projects are distributed so that more equitable and socially just approaches can be implemented. **McLain&Larson_Panel**

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

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Large-scale extractive industries in Madagascar: Perceived social-ecological impacts of operational and exploratory foreign mining investments

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Abstract

The rapid global increase in resource extraction is evident in Madagascar; a vital global biodiversity hotspot. This study examines the localized effects of operational and planned large-scale extractive investments on social-ecological systems in Madagascar. The focus is on sites owned or explored by foreign investors, specifically Ambatovy Moramanga, Ambatovy Tamatave, QIT Madagascar Minerals/Rio Tinto, Ranobe, and Tantaluma Rare Earth Malagasy. By employing a counterfactual approach and selecting villages through spatially explicit propensity score matching, we gathered survey responses from 459 small-scale farming and agro-pastoral households. Through the survey, we obtained information on general household characteristics, land use, land management, access to forests, livelihoods, well-being, and any perceived changes to these variables, as well as any perceived mining impacts related to these changes. Overall, respondents reported predominantly negative effects on land use, livelihoods, well-being, and security. Mining pollution, primarily from operational sites, reduced access to water and fisheries resources, while natural forest areas diminished. Reduced productivity due to soil, water, and air pollution negatively impacted various land uses, impacting health, particularly around QIT Madagascar Minerals/Rio Tinto. Although some projects, like Ambatovy, improved healthcare and infrastructure, most negative mining impacts occurred during both operational and exploration phases. Our study also addresses policy implications and methodological challenges, offering a comprehensive view of how large-scale extractive investments affect land, including forests, and sea use and human well-being from the perspective of small-scale farmers and pastoralists in Madagascar.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

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How China transformed to Eco-friendly Forest Development: Lens of the Dual Track Mechanism

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Abstract

Since 1998, China has experienced remarkable forest ecological restoration and government played a critical role in this process. This article aims to deliberate how local government and the state authorities came up with shared mission to transform forest development from economic development focus to eco-friendly through lens of the dual track mechanism by intensive case studies and process-tracing appraoch, with combining the concept of dual track and actor-centred power theory. Central

government and local governments jointly promoted the ecological improvement of China's forests through dual track mechanism: the project system and the administrative subcontract. Through the above two policy instruments , central and local governments are able to share common formal and informal interests in eco-friendly forest development, central and local government power dominates both policy instruments to realize their interests separately, and both central and local authorities are able to have shared goals to promote eco-friendly forest development. Our findings argue that vertical cooperation and coordination among various levels of forest authorities for transforming to eco-friendly forest development is possible and proper policy instruments are required to achieve this.

Primary FLARE Theme

Forest governance from local to global

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Ensuring direct capacity building support and thereby autonomy of indigenous peoples and local communities for conservation through local 'scaling out' of learning processes.

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Abstract

It is now globally acknowledged that Indigenous territories play a vital role in the global landscape. Its stewardship that is led by the Indigenous people and local knowledge systems is important for livelihoods, food security, conservation, and climate action (IPBES, 2022). However, decision-making and management of conservation programmes, including those that promote Indigenous people and their knowledge, still neglect their inclusion. The reasons include marginal funding to the IPLCs to carry out forest management (FTFG Annual Report, 2023) and bureaucratic barriers to participation (Basurto, 2013). In addition, from our experience, navigating the global conservation system requires complex skills like reporting, project management, and fundraising that is difficult for the IPLCs who are rooted in sustenance and community.

With the 10-month Conservation & Communities Fellowship (CCF), launched in 2023, Global Diversity Foundation (GDF) and the fellows seek to bridge the gap between local communities and these global systems. In 2024, the fellowship is designing a process for the fellows (post-fellowship) to deliver their learnings to the communities they work with, thus 'scaling out' the outcomes of the fellowship.

The innovative crowdsourcing session will invite participants to brainstorm and generate a theory of change for 'scaling out'. Although the session is led by GDF's Conservation and Communities Fellowship participants, we will invite others with similar leadership programs and fellowship experiences. Together, the participants will explore their journey of scaling out and implementing their learnings in

indigenous and local community contexts. This will include transferring practical skills and critical thinking required to engage with donors, institutions and global systems.

This thinking exercise will generate concrete action points and build collaborations between the participants to scope out a potential CCF alumni program. We want to ensure that leadership and skill building for community based conservation is not limited to those with privileged access to leadership programmes or further education. This session will deepen the reflection about how trained and educated leaders, who work directly with indigenous and local communities, can design their own processes and develop a clear path for action to scale out their learning and root it in local collective spaces.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

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Promoting Sustainable Livelihoods Among Forest-adjacent Populations in Developing Countries

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Abstract

Changes in land-use land-cover (LULC) can impact ecological and socio-economic stability at local, regional, and global scales. For instance, unchecked conversions of forests to agricultural land may lead to loss of biodiversity, changes in the hydrological cycle, and human-wildlife conflicts. The Mau Forest Complex (MFC) in southwest Kenya is the country's largest water catchment and a source to 12 rivers that feed into lakes Victoria, Natron, and Turkana in East Africa. Besides, this ecosystem supports some of the most significant sectors in the region including agriculture, energy, and tourism. However, increased exploitation of the MFC in recent decades threatens the sustainability of this natural resource and the millions of livelihoods that depend on it directly or indirectly.

In this study we employ mixed methods techniques to understand the nexus between LULC change and livelihoods among forest-adjacent populations in southwest Kenya. First, we use remote sensing and spatial statistics to quantify spatiotemporal trends of LULC within the MFC and surrounding areas over the last ~30 years. Second, we perform ordinal logistic regression based on data from 230 household surveys to investigate the perceived impact of these trends on livelihoods among the target population. We find that while the area under agriculture has increased at the expense of forests and grasslands over time, yields reported by farmers have

remained stagnant. We also show that age, level of education, income levels, and land tenure security influence the perceptions of how LULC change impact livelihoods among forest-adjacent populations. People's perceptions influence their behavior in human-environment interactions. Therefore, our study demonstrates that leveraging mixed methods can reveal the critical nuances necessary for understanding forests and human well-being, an important aspect of enhancing sustainable development. Reliable monitoring and assessment of LULC dynamics is essential for understanding complex nature-society interactions as well as designing plausible strategies and programs for mitigation, adaptation, and resilience.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Undergraduate

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Analyzing the transformative potential of Community Forest Resource rights in Eastern Maharashtra, India

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Abstract

The idea of decentralized forest governance has gained momentum globally with an increased emphasis on a rights-based approach. The Community Forest Resource (CFR) rights provision of the Forest Rights Act, 2006 of India is a major step in that direction as it devolves legally secure, autonomous and substantive rights to local communities to use and manage their forests. However, recognition of rights, does not automatically translate into positive and equitable livelihood and conservation outcomes - much depends upon the collective decision-making processes adopted at the local level and the policy support provided post-recognition. Our study therefore addresses the question: "Does decentralized forest governance, in particular the CFR rights, lead to livelihood enhancement, community empowerment and forest conservation? And what factors enable or prevent these outcomes?"

We conducted vegetation assessments, household surveys, focus group discussions and interviews in six CFR rights recognized villages in eastern Maharashtra. Our findings indicate improved forest condition, strengthening of local institutions, increased participation of women, employment generation, and livelihood enhancement through marketing of forest products. Prior resource condition and social

capital emerged as significant factors in influencing outcomes. Overall the state polices on CFR rights have been supportive, however the implementation of these policies and the support from the bureaucracy has been highly uneven and is the major impediment to livelihood enhancement. By demonstrating the ecological and socioeconomic transformative potential of CFR rights and the barriers to realizing it, our study will inform thinking about post-claims policy support. The study also contributes to the emerging literature on "beyond tenure", arguing that making use of new tenurial arrangements requires empowerment of villagers and a conscious shift towards a supportive mindset in the bureaucracy.

Primary FLARE Theme

Human well-being, poverty and forests

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A framework for just and equitable climate adaptation: implications for forest dependent livelihoods

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Abstract

As global climate change pushes communities to adapt, mitigate, and respond, there is an increasing recognition that adaptation strategies interact with existing social conditions and may exacerbate or worsen existing inequities. To better understand the scholarship on this intersection, we conducted a scoping review of literature on climate adaptation to investigate the diversity of ways in which climate adaptation researchers conceptualize equity and justice and synthesize common frameworks to lend insight into emerging practices and future research needs. Our results synthesize 316 articles and highlight both gaps in the literature and approaches to operationalizing and better understanding justice and equity in climate adaptation. Based on our scoping review, we then develop a framework for scholars and practitioners to explore equity and justice themes in their own work. Drawing from experiences working with forest dependent communities in East Africa and forest adjacent communities in Southeast Asia, we apply the framework to understand how justice and equity themes manifest in adaptation and resilience efforts. We focus specifically on Ugandan and Thai communities shifting agriculture to coexist with forest wildlife while exploring alternative strategies to obtain forest products to understand how adaptation is influenced by various dimensions of justice (e.g., procedural distributional, structural). We find that explicitly incorporating equity and justice when exploring adaptation provides greater opportunity for community engagement in adaption efforts and consideration of the role of historical conditions on present realities shaping adaptation success, and can lay the foundation for most sustainable adaptation approaches sensitive to social realities. Ultimately, we hope to provide a tangible and broadly applicable framework for incorporating justice

and equity in climate adaptation research and practice across contexts, providing increased opportunity for imaginative and innovative adaptation solutions for forests and livelihoods.

(Note that this abstract is being proposed as part of a panel session led by Daniel Miller)

Primary FLARE Theme

Forests and trees in a just climate transition

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Changing People-Nature relationships: insights from forest-edge communities in West Africa

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Abstract

Externally driven conservation interventions, like market integration, can change local communities' relationships with Nature in unintended ways. However, little is known about the people-Nature relationships among forest-edge communities in West Africa, a rapidly changing rainforest region. Using focus-group discussions with village elders, we investigated nature contributions to people (NCPs) and perceived changes in community forests in eleven sites with diverging market integration and conservation interventions.

We found that in general, communities showed a mix of instrumental, relational, and intrinsic values of Nature. Communities with greater market integration identified fewer cultural NCPs, but there were few differences between externally driven conservation and non-conservation sites. Degradation of community forests was reported from all sites, including in conservation sites. Overall results highlight the strong cultural connection most communities still have with their community forests, but this does not seem to be protecting such forests from multiple threats.

Primary FLARE Theme

Human well-being, poverty and forests

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Community-based orangutan protection and poverty alleviation: approaches, methods and SMART indicators to ensure gender equity and sustainability of outcomes

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Abstract

Orangutan populations in the northern part of Kapuas Hulu District showed serious decline, from 1,578 in 1997 to 88 in surveys between 2010-2014. Possible causes were illegal logging, forest clearing for large scale plantations, poaching and illegal trade, mostly by external actors. The remaining orangutans in this area were mostly found in sites with both non-degraded forests and the presence of strong customary rules and traditional land use systems that help protect the orangutans and forests. However, local communities in these locations lack basic infrastructure such as electricity and clean water supply, and mostly live in poverty with an average annual income of Rp. 9 million per household (US $ 630).

Meanwhile, oil palm companies continue to negotiate with communities with the aim of gaining access to the forest by promising short-term economic gains such as employment, basic infrastructure, and one-time cash payments.

To strengthen the motivation of local communities to keep their customary rules and traditional land use systems, the Darwin Initiative-funded project has been working with stakeholders to co-develop poverty alleviation activities. This paper describes the approaches and methods used to identify the activities that are appropriate for the local context, and the processes used to ensure gender equity as well as the sustainability of the outcomes beyond the project period. We also describe our grounded theory approach in developing SMART (specific, measurable, achievable, relevant and time-bound) indicators to assess the conservation and livelihoods outcomes, and lessons learned of the scalable approaches.

Primary FLARE Theme

Human well-being, poverty and forests

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Did forest citizenship reduce vulnerability to Covid-19 in the Brazilian Amazon?

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Abstract

Indigenous and traditional forest-dependent people living in remote rural communities were particularly vulnerable to Covid-19, and may be similarly vulnerable to future shocks and disasters including those related to disease and to natural hazards (e.g., flooding). This vulnerability stems from a confluence of factors, including poverty and inaccessibility of healthcare facilities. These inequities and vulnerabilities are especially apparent in Brazilian Amazonia. At the same time, some forest-dependent communities in the Brazilian Amazon have over the last decades established 'forest citizenship' by demanding recognition and claiming rights, which may confer greater resilience and opportunity. Such recognition includes the securing of territorial rights, in the form of sustainable development reserves, Indigenous territories, and *quilombos*. In this paper, we ask "What is the relationship between forest citizenship and Covid-19 vulnerability?" We answer this question quantitatively by combining spatially explicit data on human population density, territorial rights, and health outcomes, across every municipality in the Brazilian Amazon. Our analyses are still in progress, but we anticipate having a paper submitted by October 2024. We anticipate that our findings will have implications for stakeholders invested in reducing the negative health impacts of the Covid-19 pandemic and other shocks on remote rural communities in Brazilian Amazonia and in forested regions elsewhere.

This paper stems from a trans-Atlantic partnership of researchers in Brazil, the UK, and the US, examining the broader theme of "forest citizenship for disaster resilience: learning from Covid-19". The project also involves qualitative field data on forest citizenship at sites in Amazonas and Para. The project builds on previous work on forest-proximity and forest-dependence that has come out of the FLARE network. By incorporating health data, it extends this work into new directions of relevance to FLARE themes on poverty, inequality, and development.

Primary FLARE Theme

Human well-being, poverty and forests

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Deforestation and socio-environmental conflicts in Peru: exploring the pathways

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Abstract

According to recent IUCN estimates (2021), deforestation and forest degradation impact the lives of 1.6 billion people whose livelihoods depend on forests, being the majority among the world's poorest. Further, the environmental degradation deriving from deforestation can aggravate social and political tensions linked to scarcity, livelihoods, and the cultural identity. Forest-related tensions are likely to be connected to larger economic and social relations, and they can eventually escalate into violence, especially if the involved parties have a prior history of conflict and mutual mistrust (Ostrom et al.2002).

Commodity-driven deforestation represents 40% of forest loss in the tropics (Global Forest Watch, 2022), and mining plays a prominent role in this pervasive dynamic.

In this research work, I explore the patterns of deforestation of humid tropical forest and the occurrence of socio-environmental conflicts in Peru for the period 2013-2021.

The analysis is structured on three components: first, I provide a spatially disaggregated analysis of forest loss at the district level, with particular attention to those areas inhabited by native communities, accounting for spill-over neighboring effects. Then, I reconstruct the incidence of socio-environmental conflicts, exploring their connection with local mining activities. Lastly, I empirically analyze the incidence of socio-environmental conflicts at the district level considering the individual and joint effect of mining activities and deforestation. I therefore check whether the results are sensitive to a moderating effect given by the establishment of conditional direct transfers aimed at strengthening the capacities of peasant and native communities, among other actors, for forest conservation.

Data used in the analysis are gathered from multiple sources. I use geo-spatial data coming from the Peruan Forest Monitoring Platform to provide fresh insights about forest loss in the country. Through the narratives of all social conflicts monthly reported by the national ombudsperson (Defensoría del Pueblo) between 2013 and 2021, I code the occurrence of socio-environmental conflicts by administrative region, identifying their major characteristics and organizing the data as a yearly panel dataset covering 25 regions. Data about conditional direct transfers are provided by the National Forest Conservation Program for Climate Change Mitigation.

Primary FLARE Theme

Forest conservation: commons and contestation

268

Developing a framework for mapping benefits provided by forests and trees to agriculture

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Abstract

Forests and trees play a pivotal role in enhancing agricultural practices, offering a myriad of ecosystem services at local to global scales. Despite the wealth of literature on this topic, understanding these benefits comprehensively remains a challenge due to the interdisciplinary nature of the field, the diverse methodologies and approaches employed in research, and the diverse nature of ecosystems in and services analyzed. This complexity poses obstacles for decision-makers seeking to formulate effective strategies to harness these benefits for the empowerment of farmers and other stakeholders.

In collaboration with a diverse array of researchers, we are embarking on a comprehensive synthesis of existing knowledge surrounding the ecosystem services provided by forests and trees in agricultural

landscapes. Our synthesis aims to achieve three key objectives: Firstly, to ascertain the current state of knowledge regarding these ecosystem services; secondly, to identify crucial knowledge gaps that must be addressed to facilitate informed decision-making; and thirdly, to elucidate actionable decisions that can be made utilizing existing scientific insights to foster more sustainable and resilient forest-agriculture landscapes.

Our ongoing efforts have underscored the necessity of developing a structured framework to facilitate the application of research findings in practical settings. This framework is based on key classifiers, encompassing various dimensions such as the type of proximate effect (e.g., temperature regulation, pest control), the scale of effects (ranging from local to global), typologies of forests and trees (considering factors such as forest type, distribution pattern, and forest classification), outcomes of effects (including increased crop productivity, worker well-being, and ecosystem resilience), and temporal dynamics (encompassing short-term fluctuations and long-term trends).

By synthesizing research findings within this structured framework, we aim to provide guidance for the formulation of policies and strategies aimed at promoting sustainable agriculture while conserving forest ecosystems. In a world where food security and environmental sustainability are inextricably linked, leveraging ecosystem services from forests and trees is paramount for the well-being of both humanity and the planet.

Primary FLARE Theme

Forests and trees in a just climate transition

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Future of Community Forestry in Changing Contexts: Forest Users' Perspectives in the Midhills of Nepal

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Abstract

The Community Forestry (CF) program in Nepal is often lauded as a successful global exemplar of the participatory forest management model. While the CF program has reportedly achieved its initial goal of forest restoration in the midhills of Nepal, there have been dynamic shifts in forest-people interactions due to rapid changes in the socio-economic, demographic, ecological, and political landscapes of rural livelihoods in recent years. This leads to concerns about the ongoing functionality and effectiveness of the CF program in the context of evolving governance systems and structures, the changing role of forest resources in rural livelihoods, and socio-economic transformations triggered by outmigration. In 2023, we conducted a survey among CF leaders (N = 55) and households (N = 874) in Nepal's midhills districts to ascertain the factors influencing the perceived future of CF. Using the social-ecological system (SES) framework and recent meta-review studies, we selected explanatory variables for our empirical model, which allowed us to analyze diverse socio-ecological and governance factors. Despite

significant socio-economic and governance shifts in the rural midhills, the majority (80%) of respondents expressed optimism about CF's future. Our analysis revealed that factors like long-term migration, crop raiding, off-farm income, land size, fuelwood dependency, membership in local groups, and the involvement of local governments significantly affect the perceived outlook of the CF program in the changing context. Moreover, we found that evolving factors such as migration, crop-raiding, off-farm income and the engagement of local governments that interact with forest users' socio-economic dynamics significantly shape users' decision-making to participate in forest resource use and management. These findings highlight the evolving nature of forest-people interactions in Nepal, marked by declining participation and fading collective actions for CF management. Understanding these dynamics is crucial for informing CF programs and policies to adapt to changing socio-economic and governance contexts and revitalize local collective efforts.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Ph.D.

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Leveraging best practices and innovation for smallholders sustainable production systems within the Forest, Agriculture, and Commodity Trade Dialogue (FACT)

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Abstract

FACT, the Forest, Agriculture, and Commodity Trade Dialogue, brings together 28 countries that endorsed the FACT Road Map of action at COP 2026 in Glasgow. Member countries include major producers and consumers of internationally traded agricultural commodities, aiming to safeguard forests and ecosystems while promoting sustainable trade and development amid climate and biodiversity crises. FACT serves as a unique space bridging sustainable commodity production and deforestation, engaging both consumer and producer sides of the forest sector. By fostering knowledge sharing and open and informal dialogue among countries FACT accelerates learning and leverages best practices, particularly in supporting smallholders. Ongoing efforts prioritize the exchange of innovations and best practices and the expansion of support for smallholder farmers across six "promising approaches," including strengthening stallholder's organizations, improving technical capacity, enhancing land tenure security, securing long-term financial resources, improving access to information,

and enhancing resilience to climate change. This session will be organized in a participatory format, engaging the audience in dialogue among policymakers, researchers, and other stakeholders. The aim is to explore how this government-to-government global platform can reshape collaboration among countries, drive innovation, and accelerate learning for sustainable and equitable opportunities for smallholders. The long-term goal is to address the transformation of commodity production practices, improve forest governance, enhance the well-being and livelihoods of smallholder producers, and reshape relationships between forests, trees, and people.

Primary FLARE theme

Forest governance from local to global

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Land Conflicts, Legal Pluralism and the Prevention of Forest Degradation

Susan Ostermann[1], Josephine Wouango[2]

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Abstract

Land/natural resource disputes are exceedingly common in rural areas throughout the world and have been associated with civil conflict (Collier & Hoeffler 2000; Amman Duraiappah 2001). If such conflicts end up in formal dispute resolution processes, this can take long periods of time (Buscaglia & Stepan 2005). When a land conflict exists and is not resolved quickly, rural dwellers become dispossessed and dispossession is association with forest degradation (Farell et al 2021; Gabay 2017). Given this pattern, innovative dispute resolution processes that resolve land conflicts quickly stand poised to prevent forest degradation. This paper examines compliance with wood cutting/collection prohibitions in protected areas and formal and informal methods of managing land conflicts in rural communities in Burkina Faso, Mali and Kenya. Data collection assessed compliance with wood cutting/collection prohibitions, as well as the most common disputes and conflict resolution mechanisms in the study areas using: 1) a large-N survey to establish compliance rates and common conflict types; 2) key informant interviews with community gatekeepers, government workers and law enforcement officials; and 3) focus group discussions with adult men and women to assess their perceptions of land issues and behaviour in response to same. The data reveal that there is substantial compliance with wood cutting/collection prohibitions in surveyed communities in Burkina Faso and Mali, even though land conflicts were the most common conflict-type in both locations. This was not so in Kenya, where the formal system dominated and legal pluralism was minimal. In Burkina Faso and Mali, dispute resolution mechanisms were generally customary, managed and implemented primarily by the village chief and the land chief. Respondents preferred the customary system for its speed and for its focus on social cohesion and saw the formal system as slow, fear-based, distant, complex and corrupt. Though the customary and formal systems

are currently pitted against one another, pluralism can be useful. The state can preside over the customary system, ensuring basic fairness, while allowing that system to do what it does best: prevent conflict and forest degradation through speedy resolution of land disputes.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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Rights-based decentralized forest governance in India: Multiple subversions as 'weapons of the strong'

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Abstract

The Community Forest Resource Rights (CFRR) provisions of the Forest Rights Act 2006 offer an unprecedented opportunity to decentralize and democratize forest governance in India. But even 16 years after the Act came into effect, their implementation has been slow, patchy and of poor quality. The consistent opposition to these provisions from foresters, who continue to believe in the colonial, i.e., statist, approach to forestry is one obvious reason, but complete inattention by the political leadership has also been a confounding factor. CFRR implementation in Chhattisgarh state between 2019 and 2024, however, offers a case where the political leadership sought to implement these rights vigorously. And in fact, over this period, they claim to have recognized these rights in ~4,200 villages out of a possible ~11,000, which is no mean achievement. We draw secondary as well as primary data on the CFRR titles recognized and their quality, and direct observations of and interactions with the actors involved and the processes followed, to show that the foresters have figured out multiple ways to subvert the decentralization process. In a majority of cases, the foresters created spurious claims that did not involve villagers and led to the recognition of much lower and wrong forest areas; the latter triggering inter-village conflicts. Where civil society groups have enabled villagers to claim proper titles, the foresters have manoeuvred to reclaim the authority to tell villagers how to manage their forests and how to write management plans, even while playing divide-and-rule or threatening with arrests when villagers oppose its timber harvesting policies that villagers think are deleterious to the health of the forest. Control over spatial information (maps) and a monopoly claim on defining 'scientific' forestry are some of the 'weapons of the strong'. These material and cultural strategies have to be countered in the same vein if decentralized governance of forests is to make real headway in the central Indian forests.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Local governance of natural resources: insights from nine forest contexts in West Africa

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Abstract

It has been suggested that traditional ecological knowledge (TEK) plays a key role in forest conservation. However, few studies have investigated how diverse components of TEK, such as perceptions of ecological limits in available natural resources, traditional rules about resource use or perceived changes in resources, affect forest management at local scales.

This paper focused on nine different community-managed forest contexts located in Sierra Leone, Liberia, Guinea, and Ivory Coast and drives insights on these issues. We conducted semi-structured interviews with 450 respondents - 50 per site, including 25 young (18-35 years) and 25 old (>45 years) male respondents, and focused on four natural resources: water, medicinal plants, wild meat, and land for farming.

We find that most respondents noted that the four natural resources studied were not unlimited, and that, in general, respondents knew more traditional than government rules on these natural resources. Most respondents had perceived a reduction in the abundance of these natural resources. Some important differences were observed across sites, with e.g. less knowledge of rules and perception of resource limits in Cavally.

We discuss the potential reasons underpinning our results, related to market integration, exposure to migrants and tourists, and nearby protected area status and law enforcement. This paper contributes to the broader literature on natural resource management by providing insights on the diverse factors driving collective response for the sustainable management of natural resources in community-managed forests.

Primary FLARE Theme

Forest governance from local to global

Student Level

Ph.D.

285

"Planning" community-based forest management: empowering, irrelevant or hegemonic?

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Abstract

How should communities go about planning and managing their community forests is a question that emerges sharply in the context of India's attempted transition to decentralized governance. The Forest Rights Act of 2006 offers forest-dwelling communities in India the opportunity to assert the right to access and manage their customary forests under its Community Forest Resource Rights (CFRR) provisions. Once they receive titles, they are required to write 'management plans' for these forests. In the state of Maharashtra, which was at the forefront of recognizing CFRRs, creation of management plans was also supported by the state across hundreds of villages and it was carried out by civil society actors. Maharashtra state also set up district-level 'convergence committees' to facilitate state funding of the actions proposed in these plans. Our analysis of several tens of management plans shows multiple flaws in these plans: burdensome processes that disempower villagers, the continued hegemony of 'scientific forestry' and 'working plan' thinking that is irrelevant to multipurpose non-timber oriented forestry, and the constant pressure to 'fit' or 'make legible' people's plans as per government 'schemes' and their bureaucratic, technical and financial parameters. In contrast, many villages have moved forward with 'management' without writing formal plans, enforcing some simple forest conservation rules and focusing on non-timber forest product marketing. We therefore proposed a via media, an alternative, people-friendly and problem-driven approach to management planning, and this was in fact notified by the state government as a possible alternative template. We present data from those few cases where this approach was attempted to show that such planning processes empower people but then run afoul of the technocratic and bureaucratic mindset of state officials. Preventing 'planning' from becoming another form of hegemonic state control or even of 'modernistic scientistic' thinking and a tool for genuine community empowerment will thus require changes in formal structures and mindsets at multiple levels.

Primary FLARE Theme

Forest conservation: commons and contestation

287

Tropical forest fires and changes in the use of wild foods and resources: a longitudinal study

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Abstract

Invasive fires have become both more frequent and severe in tropical forest landscapes. Their impacts have been largely understood by quantifying associated carbon emissions, area affected, species impacted or the consequences for ecosystem function. Yet the rising flammability of tropical forests presents immediate and poorly understood implications for the lives, lifeways and livelihoods of traditional populations. Traditional peoples harvest forest products and game species that provide nutritional diversity, contribute to family food security, offer medicinal properties and contribute to the relational fabric and culture of daily life. The proximate and interlinked relationship between traditional peoples and forests, means that these communities likely suffer when forests are degraded through extensive fires. Further, feedbacks between fire, food and resource availability and hunting pressure are not well understood. This panel study utilized household questionnaires across two time steps to capture data on species use and perception-based data on species abundance and recovery following fire. We asked: 1) Which species of fauna and flora do traditional communities use and integrate in their diets and livelihoods? 2) Has there been any change in the portfolio of animal species used, and amounts hunted or consumed between 2010 and 2019? 3) How do hunters perceive fire to be impacting the species local people depend on for their livelihoods?, and 4) is there any relationship between perceived fire impacts and changing hunting patterns? We collected household data in 2010 (n 154) across 12 communities, and revisited a sub-sample in two communities in 2019 (n 70). Communities were located in two fire-affected sustainable use reserves in Pará state of the Brazilian Amazon. Whilst various flora and fauna are harvested from forests, the level of use has decreased over time. The role of fire in this change is unclear for many species suggesting additional factors are interacting. We consider the implications of declining forest use for the biocultural diversity that is fundamental to conservation in the region and outline future research directions.

Primary FLARE Theme

Human well-being, poverty and forests

288

Forests and livelihoods in West Africa : is innovation the key for a successful sustainable management ?

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Abstract

Forests faced several challenges in Africa and particularly in West Africa among which climate change and resources overexploitation. Nowadays, with the development of artificial intelligence and new new technologies, there is an increasing emphasis on these innovations in forestry and natural resources management. These developments do not have the same importance across the continent and all parts of Africa seem not to be equal regarding these new initiatives. The increasing attention to innovations raise the following question: are innovations essential for the sustainable management of forests and natural resources and improved local communities livelihoods in Africa and particularly in West Africa? Based on literature survey and study cases, we reviewed innovations in the forestry sector in Africa with a focus on West Africa. These innovations are mainly related to natural resources monitoring but also communities' participation. Despite West Africa region seeming not to be the most prolific in Africa in terms of innovation, there are many promising initiatives. It is important to note that before innovations, several existing technologies and policies have potential and could lead to important changes in resources management and local communities' livelihoods if they are well applied. However, innovations are important to help cope with new challenges especially those related to climate change and the escalating demographic growth. This work highlights the importance of innovation in the forestry sector in West Africa, the existing potential and the role of different stakeholders (governments, researchers, communities) in promoting innovations for sustainable forests management.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

294

Participatory approaches for engagement: a new toolkit for conservation practitioners

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Abstract

 Participatory approaches encompass sets of principles and methods to bridge power gaps and promote fair and inclusive decision-making. Such tools can be valuable in forest conservation to forge resilient partnerships, strengthen rights and amplify voices of disadvantaged groups and facilitate knowledge-sharing and collaborative action. However, conservationists may not be making full use participatory approaches, as many have been developed in fields such as international development, education, public health and pro-democracy movements. A new toolkit, Participatory Approaches to Conservation with Local Communities and Indigenous Peoples, seeks to make participatory approaches more accessible to those working in forest conservation, whether in partnership with, or as part of, local communities. It is an open-access resource, developed from online workshops, a desk-based review and field-testing of tools in three case-studies. The case-studies involved conservation and livelihood

projects in Kazakhstan, the Turks and Caicos Islands and Sierra Leone. We demonstrate that a large range of existing resources are available, and the toolkit maps over 100 online resources which include websites, toolkits, training materials, best practice guidelines, searchable repositories and databases, reports, academic papers and videos. Toolkit chapters seek to contextualise these resources, providing a discussion on principles and practical aspects of participation, the roles and types of participatory approaches for thematic areas such as land and resource management, and providing more detailed information on specific techniques such as visioning and mapping. Resources were found which targeted the needs of the conservation community, yet our workshops and case-studies indicated that there remains wide variability among conservation practitioners in terms of familiarity and experience in applying participatory approaches. Lack of expertise and practical experience in organisations emerged as a key challenge, and one which was mediated by the cultural contexts in which they operated. We suggest that online resources are likely under-utilised, but that these also have limitations since adoption of participatory approaches can require the mutually reinforcing effects of direct learning and experience, along with shifts in attitude and mindset.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

297

Assessing the drivers of land abandonment and intervention measures in forest-based land reform projects in the Gert Sibande-District in Mpumalanga Province, South Africa

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Abstract

Historically, black people in South Africa were intentionally marginalised and excluded from the mainstream economy and as a result lack the capacity and skills to run efficiently forestry farms they acquired through land restitution process. Hence, the collapse of transferred land due to underutilization by new beneficiaries has been widely witnessed and confirmed. This study assessed the drivers of land abandonment in afforested land reform projects in Gert Sibande District in Mpumalanga province, to formulate mitigation measures on how to revive these farms to full production to positively contribute to and/or improve beneficiaries' livelihood. Semi-structured questionnaire was administered to randomly selected heads of households from both Jabulani (n=110) and Thuthukani (n=75) communities. Furthermore, we also conducted focus group discussions to solicit an in-depth understanding of conditions on the farms when the transfer took place, and what happened in the interim before the farms collapsed. We used parametric and non-parametric statistical analysis to compute the proportions of the respondents' perceptions on drivers that contributed to land

abandonment, preference for households on intervention measures and determining overall and community specific significant differences on the perceived drivers contributing to land abandonment. Our study findings revealed that lack of benefit sharing was the most leading driving factor contributing to land management failure or abandonment. Furthermore, our study established that participatory forest management, strategic partnerships and agroforestry are preferred management strategies for forest plantations restored to land restitution beneficiaries. Similarly, literature prominently suggests that mutual strategic partnerships will unlock opportunities for fair and stable markets, capacity development and mentorship, which could solve the business aspect of the abandoned farms. On the same note, many scholars have emphasized that community cohesion can be strengthened through participatory forest management, which may deal with a number of social ills such as unemployment and the rate of crime. Considering that rural communities have been reliant on subsistence farming for decades, they resonate better with food, and/or short rotation crops, therefore incorporating agriculture with forestry will be crucial.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

298

Can community-based forest enterprises survive in the formal market? Challenges from a decolonial environmental justice lens

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Abstract

While community-based forest enterprises (CFEs) have gained wide popularity as a sustainable development strategy, extensive scientific evidence has documented diverse challenges faced by CFEs to survive in the formal market and associated environmental justice concerns. Some of the most discussed issues include market barriers, bureaucratic regulations, and deficient technical assistance. However, despite a focus on justice, most work has been theorized under Western norms and analytical frameworks, failing to reflect local perspectives, epistemologies, and informal practices and furthering domination and misrecognition. Decolonizing theoretical and methodological approaches are needed for a more critical analysis of CFEs. Using a decolonial environmental justice lens, this study examines how the challenges faced by CFEs are linked to coloniality, focusing on the largest Amazonian region of Peru: Loreto. Looking at diverse CFEs in 19 Indigenous communities located along two distinct river basins, we assess CFEs challenges regarding (i) structural marginalization, (ii) ontological injustice, (iii)

epistemological injustice, and (iv) Indigenous autonomy. To do so, we use decolonizing methodologies (e.g., Indigenous and local students involved as co-researchers), apply different interview guides to different types of informants, and conduct ethnographic work. Our findings uncover diverse forms of ontological injustice, epistemological injustice, structural marginalization, and infringement of autonomy rights that are inexorably interlinked and tied to the struggles faced by CFEs. The inflexible, costly, and bureaucratic approach that makes several CFEs initiatives fail, is a reflection of patronizing and racial relationships of power. The participation, benefit-sharing, and forest management systems that many initiatives bring along regularly push for a capitalist competition logic, impose 'technical' and apolitical knowledge systems, and ignore or reproduce diverse forms of structural discrimination and marginalization. Consequently, initiatives fail and even exacerbate injustices. The more politically and culturally sensitive analysis of CFEs that we developed can help initiatives better respect communities' rights, build on local systems for conservation, and respond to local ways of life and needs. Overall, our findings contribute to make the effects of coloniality visible for governmental agencies and practitioners investing in CFEs and inform their efforts, towards advancing justice. Results are relevant for Peru and the Amazon region as a whole.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

299

Exogenous and Endogenous Institutional Arrangements in Forests Landscape Restoration in the Western Highlands of Cameroon: Impacts on Rural Communities' Choices

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Abstract

Forest Landscape Restoration (FLR) continues to gain both scientific and policy traction globally due to the ravaging effects of forest loss. While issues of FLR governance recently are attracting scientific attention due to their potential to ensure successful FLR, the extent to which exogenous and endogenous institutional arrangements constrain or enhance the activities of rural communities is vaguely captured in the literature, especially in sub-Saharan Africa. Similarly, FLR-related choices of rural community members due to the impact of exogenous and/or endogenous institutional arrangements are vaguely reported. To bridge this knowledge gap, we used the exogenous-cum-endogenous institutional analytical lens to investigate the potential effects of exogenous and endogenous institutional arrangements on FLR-related choices of rural community members in the Western Highlands of Cameroon. We employed 244 household surveys complemented with nine expert interviews, 24 key informant interviews, and 15 focus group discussions to obtain data for this study.

The analysis of the study revealed the following: first, while the exogenous institutional arrangements constrain the livelihood activities of rural people in Cameroon more than they enhance, the endogenous institutional arrangements enhance the people's livelihood more than they constrain. Second, people impacted more by the institutional arrangements participate less in FLR-related activities than their counterparts. Third, more rural people support the creation of sacred forests and the planting of culturally related trees than they do support state-sponsored tree-planting activities and forest reserve establishment/protection. Hence, FLR intervention agents should work towards fostering more inclusive, participatory, and culturally sensitive FLR initiatives in Cameroon. Additionally, FLR actors should focus on reforming exogenous institutional arrangements to reduce their constraints on rural livelihood activities in Cameroon. Finally, further studies should rigorously assess the impact of existing FLR exogenous and endogenous institutional arrangements to evaluate their effectiveness in achieving ecological, social, cultural, economic and political objectives.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

301

Equity in Action: Matching Restoration Action to Restoration Needs in the Bawku West District of Ghana, West Africa.

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Abstract

Thirty-three percent of Ghana's landscape is threatened with desertification occurring at an estimated rate of 20,000 hectares per annum. The ecological zones of Sudan savannah where the research was conducted, is more degraded than 75% of the country. The scenario has prompted restoration efforts addressing the underlying socio-cultural, environmental, and economic causes of degradation as well as the resulting livelihood and food security issues. There is growing criticism that restoration misses critical equity aspirations when implemented through existing sociocultural institutions that have inherent structural problems. Existing structural challenges retain unfair characteristics that hinder equity of restoration outcomes, particularly at the landscape scale. This paper used sex-disaggregated focus group discussions embedded with scoring exercises to reveal gendered perspectives of land use importance, degradation and land uses prioritized for restoration in practice. Results show differences in men's and women's perspectives of land use importance and degradation underlined by gendered

access prescriptions and comparable gendered perceptions of sites prioritized for restoration tied to the security of perceived benefits of restoration action. Results also show restoration action focused on land uses where women have limited access which potentially marginalizes women benefiting from restoration outcomes. The paper compares perceptions of land use degradation to sites prioritized for land restoration action and sheds light on the equity dimensions of current restoration action, highlighting that prioritizing land uses for restoration based on the security of benefits excludes large, degraded land uses from restoration action. This reduces restoration impact at the landscape scale. The paper observes that if this restoration trajectory continues, women's land use and tree resource access deteriorate along with global equity commitments, requiring gender sensitive context specific approaches across scale for achieving gender equitable restoration.

Keywords: Land use; Degradation, Restoration, Equity, Gender, Guinea Savanah, Sudan Savanah

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

Student Level

Ph.D.

302

Closing Gaps Between Technological and Social Eco-Innovation and - Entrepreneurship in the Brazilian Amazon

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Abstract

The Brazilian Amazon Rainforest (BAR), a critical component of global biodiversity and climate regulation, faces unprecedented threats from deforestation and climate change. The BAR is Brazil's least developed, poorest, and largest region. Important economic sectors (e.g., agriculture, cattle ranching) insist on lobbying for regional development that fails to align with forested-landscapes vocations to empower people and ecologies. In recent years, eco-entrepreneurship has boosted a new paradigm for the BAR development: sociobieconomy, a development model that seizes cultural/ecological/institutional vocations - and (often) technological and social innovation - to catalyze transitions towards more sustainable economies and business practices.

My research examines the potential of Artificial Intelligence and its Enabling Technologies (AIET) in fostering eco-innovation and eco-entrepreneurship in the BAR, bringing evidence about their role in promoting sustainable forest management and conservation, and boosting sociobioeconomies. By exploring advancements in AI, the Internet of Things, Big Data, and other technologies, my study discuss the dynamics of technological and social innovation in forest-related sectors - e.g., carbon markets,

supply chains, biotechnology, enhancing monitoring and reporting and verification mechanisms, facilitating community engagement on/and reforestation efforts.

The methodology used encompasses a review of scientific literature, interviews with key stakeholders in the BAR (e.g., entrepreneurs, policymakers, innovators, impacted communities), and analysis of study cases. This research has identified current AIETs, their applications, and anticipated future trajectories of technological adoption in forest conservation strategies and eco-entrepreneurship/innovation. By providing evidence-based insights into the role of AIET in the BAR to create and improve economic instruments, my research aims to inform practitioners, entrepreneurs, and other stakeholders about the potential of AIET for eco-entrepreneurship amidst forests worldwide.

Moreover, my research highlights challenges and negative consequences of AIET deployment, including technological accessibility, data governance (e.g., accuracy, justice), lack of awareness of regional issues by designers of R&D programs and policies, and the potential for unintended ecological impacts. It underscores the importance of systems thinking to ensure root issues are addressed, governance that reflects regional realities and demands gets established, and interdisciplinary and human-centric approaches in socio-technological innovation to address complex socio-environmental-technological challenges.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

Master's

304

Exploring different actors' perspectives on the effectiveness of zero deforestation commitments in the Brazilian Amazon.

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Abstract

Deforestation is frequently referred to as a wicked problem due to complicated dynamics that cause deforestation lock-in in agricultural production and consumption systems. However, there are various initiatives aimed at reducing deforestation, but they have not been effective on a sufficient scale. Supply-chain interventions to prevent commodity-driven deforestation have often been criticised for failing to address landscape-level results, crucial issues such as local food security and equitably consider key stakeholders' voices and needs. The Brazilian Amazon biome is known for its vast forests and biodiversity. It is also a significant supplier of food and mineral commodities to worldwide markets,

including beef, leather, and soy. The exploitation of these resources has been contributing to forest loss and degradation, increase poverty and inequality, and impact local actors' livelihood. We conducted semi-structured interviews and Q-methods with key stakeholders (e.g., government representatives, civil society organisations etc) and rural communities to elicit different perspectives on how current zero deforestation commitments (ZDCs) perform in halting deforestation in Amazonas and Pará states. Specifically, we solicited rural communities for their perspectives on land use priorities and challenges within their landscape. Our preliminary findings suggest that ZDCs are ineffective in halting deforestation, and that various actors react and adapt differently to governance measures. Furthermore, such commitments fail to address local needs and concerns, including food security, governance participation, and land use dynamics. We conclude that there is the need for further research to enhance strategies for assessing and evaluating demand-side interventions that can successfully reduce tropical deforestation. This can also help policymakers improve their understanding of tropical deforestation and pertinent policies, as well as embrace the best-bet policies that might contribute to reduce deforestation.

Primary FLARE Theme

Forest governance from local to global

308

Exploring social learning networks as collaborative agency for enhancing multi-use forestry and biodiversity management in Sweden

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Abstract

Alternative forest stewardship methods have the potential to provide a wider variety of income opportunities in rural regions while also improving a range of environmental services. In this study, we focus on family forest owners in Sweden and their social learning networks as representing a potential fulcrum on which the adoption of multi-use and alternative forest management practices may hinge. The aim of the study is to investigate how networks and processes of small-scale change in forest practices collaboratively facilitate social learning for forest owners. More precisely the study pays attention to how social learning can be leveraged to accelerate the adoption of alternative forest management methods and multi-use forestry and how policy interventions can build from these insights to improve rural livelihoods and biodiversity outcomes. In this study we have made in-depth interviews with private forest owners and people involved in social networks to understand how they reason and make decisions in their forest management. This exploration addresses the possibilities and limitations of leveraging the existing social learning processes of private forest owners engaged in forestry management that includes caring for biodiversity and the organizations supporting such processes. In doing so, we can better understand how private forest owners doing multi-use forestry and their social networks can be change agents for alternative forest management that integrates biodiversity

considerations. We argue that such insights have the potential to improve policy interventions that enable the processes of learning and innovation among key actors to accelerate the implementation of more sustainable forest use and management while also contributing to rural development.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

309

Exploring household preferences for ecosystem services as a basis for strategic land use and conservation planning in Savannakhet province, Laos

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Abstract

In rapidly changing tropical landscapes, the encroachment of permanent large-scale natural resource exploitation projects into biodiverse forested areas poses a threat to critical ecosystem services and human well-being. Delving into the complex dynamics between land use patterns, ecosystem services, and biodiversity in Savannakhet province, Lao PDR. My study sheds light on the challenges and opportunities for sustainable development and natural resource management in dynamic and contested landscapes. This addresses pressing issue by investigating household preferences for ecosystem services and biodiversity amidst evolving land use patterns.

By employing a robust methodology integrating ecological, socio-economic, and livelihood perspectives through a comprehensive household survey and nuanced analysis, we uncover the nuanced preferences of local residents, providing valuable insights for policymakers and practitioners seeking to promote sustainable land use practices and biodiversity conservation.

My study finds that while *Forests* are vital for all dimensions of ecosystem services, preferences vary across different strata, emphasizing the need for tailored conservation strategies. Furthermore, the *Collection of wild plants*, and *Landscapes with cultural, symbolic, heritage, sacred, or spiritual meaning* emerge as top priorities for household well-being, highlighting the significance of forest ecosystems in meeting local needs. However, our analysis reveals variations in preferences for different land use types, underscoring the importance of considering local context in conservation planning. These findings contribute to advancing scholarly understanding of the intricate relationships between forests, human livelihoods, and environmental governance, offering practical implications for fostering bottom-up approaches to enhance ecosystem services and safeguard biodiversity in similar contexts globally. Additionally, this research provides crucial evidence for redefining land values beyond mere monetary considerations, contributing to more just land compensation mechanisms, highlighting the significance of promoting a multifunctional landscape approach for effective land management and biodiversity conservation.

310

Institutional Bricolage and Forest Resource Appropriation in Nepal's Community Forests: Actor's interests and socio-political attributes triggers

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Abstract

While recent evidence on the variations in institutional bricolage exist across geographic regions in Nepal, the determinants of such variations remain oblivious in the literature. Using the case of eight CFUGs across four physiographic regions in Nepal, this paper analyses the role of socio-political factors in shaping institutional bricolage manifestation, focusing on forest resource appropriation. Data from 342 household interviews, 38 focus group discussions, 61 key informant interviews, and document reviews, were analyzed using descriptive analysis and logistic regression to specifically analyze (a)local actors' interests, and their socio-political characteristics, and (b) relationship between socio-political attributes of local actors and institutional bricolage manifestation in different socio-ecological settings.

The study reveals the following: i) local actors exhibit diverse interests in CF benefits, such as wealthy and upper-caste male have interests on commercial forest products, while poor, women and lower caste groups have preference on subsistence products; ii) the most significance social-and political attributes explains the institutional bricolage. For instance, the findings indicate the significance of social network/linkages, caste-based hierarchy, knowledge, and power features as bricolage determinants linked to forest resource extraction and usage; and iii) local actors, specially, wealthy and upper caste male resource appropriators draw from incentives and dominant information (DI) to foster aggregation, alteration and erosion, marginalized groups rely on DI, to foster articulation and aggregation. Likewise, CFUG executive committee employs coercion and DI to aggregate or adjust or reject various formal or informal institutions.

This study highlights the role of local actors' interests and socio-political attributes in shaping institutional bricolage amid changing socio-economic and ecological contexts, contributing to critical institutionalism and understanding the nexus between power and institutions. Future

research should explore power dynamics among meso and macro-level actors in forest management institutions.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

311

Exploring Instrumental and Relational Perspectives in Livelihood Decisions through Serious Games

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Abstract

Afro-descendant tribal communities in Suriname strongly depend on forest goods and services on a daily basis, but are confronted with opening up of the forest, western influences, modernization, cash economies and competing land-use interests. Traditional shifting cultivation and forest products are central to the Saamaka peoples' livelihood in the Upper Suriname River basin (USRB), an early forest-transition landscape. Nowadays, the Saamaka need to generate income, and face increased risks from land-use conflicts and climate change. Local communities seek to improve agricultural productivity or seek alternative, sometimes less sustainable, livelihoods. Civil society and research organisations are responding to this need with alternative practices and capacity strengthening, but from an 'outsider's' perspective, while external private interests receive licenses for exploiting natural resources in the area. The lack of formalized land tenure rights leads to uneven power dynamics and complicates this situation. In our study, we use a serious game for communities to explore improvement of their livelihoods, and their living area according to their perspective. Our research aims to assess how instrumental and relational values of selected ecosystem services are balanced in livelihood decisions. We i) Developed a serious game to interact with communities in the USRB, ii) Use the Q-method to assess how games may affect players' systemic understanding of the system, and iii) Analyse debriefing discussions and game results to gather insights into instrumental and relational values associated with the players' strategies. We expect that the serious game will be a simple, useful tool to engage with communities, and that the Q-method results will shed light on the game's potential to contribute to new understanding. The results from our study will contribute to the growing body of literature on the use of serious games in natural resource management contexts and to the improvement of its systematic development, application and assessment. With the application of the game we hope to facilitate meaningful discussion among the Saamaka concerning their livelihood, wellbeing and the future of their

territory, and that our results contribute to the discourse on the use of participatory tools for understanding local perceptions and empowerment.

Primary FLARE Theme

Data and methods for understanding forests and human well-being

Student Level

Ph.D.

313

Bringing tenure considerations into Forest Landscape Restoration project design: The Tenure, FLR, and Livelihoods Toolbox

Rebecca McLain[1], Anne Larson[1], Patrick Ranjatson[2], Abdon Awono[3], Philiippe Guizol[4], Fabrico Nomenjanahary[2], Renaud Randrianasolo[2], Guylou Stéphane MVAEBEME BITOUMOU[3]

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Abstract

Tenure and tenure security are key factors influencing not only who chooses to invest in forest landscape restoration, but also how the costs and benefits of FLR are distributed within communities. But the links between tenure and FLR in communities targeted by FLR initiatives are often poorly understood and not incorporated into project designs. All too often, this leads to unintended negative impacts on the livelihoods of the most vulnerable community members. In other cases, it results in the promotion of FLR approaches that are ill-adapted to local contexts, and unwillingness on the part of local community members to adopt them. One challenge is that tenure systems are complex, and many FLR practitioners lack the knowledge and skills to collect data that adequately describes tenure patterns and how those influence FLR behavior. To address this challenge, researchers with the BMZ-funded project, "Tenure, FLR, and Livelihoods in Madagascar and Cameroon" have developed a toolbox that practitioners can use to identify key tenure patterns and how they affect motivations to invest in FLR. In this presentation, we provide an overview of the key tools in the Tenure, FLR, and Livelihoods Toolbox (TFLT). The toolbox includes 1) definitions of key concepts, 2) a village walk guide for rapidly identifying the key tenure categories in local communities, as well as FLR practices associated with each category, 3) a set of hypotheses about links between tenure and FLR to guide focus group discussions and key informant interviews, 4) an analytical rubric to assist practitioners in interpreting the data collected, and 5) a guide for eliciting community feedback on the tenure and FLR assessment results. Our presentation describes lessons learned from field testing the toolbox in Cameroon and Madagascar, as well as projected steps for making it widely available. The TFLT helps fill an important gap in the tools available to FLR practitioners; our hope is that its use will enable practitioners to more readily incorporate tenure considerations into the design of FLR initiatives and projects. **McLain&Larson_Panel.**

314

Conservation Relationships: Evaluating Formations and Perceptions of Trust Between Native Communities and External Conservation Organizations in the Awajún Indigenous Communities of Alto Mayo, Peruby Eva Garces-Foley

Eva Garces-Foley

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Abstract

Partnerships between conservation organizations and Indigenous Peoples and Local Communities require a foundation of trust and common understanding for the success of conservation initiatives and the wellbeing of local populations. A prevalent climate of mistrust between international conservation NGOs and local communities due to power imbalances and lack of transparency can inhibit such successful partnerships.

In the case of Conservation International's decade-long Indigenous Communities Project in the Alto Mayo basin of Peru, the issue of trust in the implementation of the organization's Conservation Agreements is especially visible. The agreements, which are co-designed benefits packages between the international conservation NGO and the Indigenous Communities, require a constant process of trust building.

This study is based primarily on ethnographic research conducted in 2024 in the Awajún Indigenous Communities of Alto Mayo, Peru. It sheds light on processes of trust formation by investigating how perceptions of trust by an international conservation NGO and members of the Awajún communities affect the success of the Conservation Agreements and the overall conservation partnership. My study uses ethnographic methods of participant observation and interviews to examine the relational aspects of conservation partnerships through which trust is formed and perceived.

Fieldwork is not yet completed, but I expect to find that Conservation International's long-term presence, spaces for dialogue and education, incentives for poverty alleviation, and intercultural understanding are factors that have built trust between the Indigenous communities and the conservation organization. I anticipate that this generates further perceptions of cooperation and common ground among members of the local community and conservationists pertaining to forest conservation in the region.

It is known that trust is a crucial component in conservation partnerships, yet research is lacking on the impact that perceptions of trust have on conservation agreements which is a growing method of conservation. This research will contribute to the ongoing discussions of the formation of genuine long-term conservation partnerships. With respect to the theme of this year's conference, "Imagination and

Innovation for Forests and Livelihoods," this research emphasizes the importance of prioritizing trust-building and human connection as we imagine innovative strategies to tackle forest and livelihood challenges.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Undergraduate

315

Neglected and underutilized species: Promoting valuable crops in organic agroforestry systems

Emma Barrett

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Abstract

Since the 1960s, global food systems have become increasingly reliant on a small number of species, particularly on a select number of carbohydrate-dense crops. These crops, such as corn and wheat, have been subject to decades of investment and research. While these varieties provide sufficient calories, excessive reliance on them has resulted in less consumption of vitamin- and mineral-rich foods. Additionally, increasingly unpredictable climate conditions call for cultivating plants that are adapted best to a local environment, which in many cases do not include cash crops. This large but underrepresented category of plants is called Neglected and Underutilized Species (NUS). "Neglected" refers to a lack of investment in research in these species and "Underutilized" refers to the untapped potential of these species to improve livelihoods. NUS can provide a myriad of nutritional, biodiversity, socioeconomic, and climate benefits. Based on a literature review, I show the benefits and challenges of implementing NUS, with an emphasis on potential implementation in agroforestry systems (AFS). Six NUS—quinoa, teff, cowpea, mung bean, sacha inchi, and moringa—are included to showcase examples of high-potential, underutilized plant varieties. Successful NUS and AFS systems require biodiversity, and thus examining NUS as components of AFS may reveal their suitability in AFS systems. The main challenge facing both NUS and AFS are gaps in sufficient research, which hinders the ability of these species to be scaled. Increasing investment into research will be imperative in encouraging the adoption of NUS and AFS, and in turn fostering community-led, environmentally restorative, and equitable food systems.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Undergraduate

316

Understanding households' choice of coping strategies to shocks in rural Malawi

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Abstract

Shocks pose significant barriers to poverty reduction in rural sub-Saharan Africa, particularly in countries like Malawi, where households frequently encounter persistent and multifaceted uncertainty. While forests and environmental resources have often been perceived as vital safety nets, providing avenues for income diversification and natural insurance, this study seeks to gain a deeper understanding of rural Malawian households' coping strategies. Utilizing primary household survey data, I investigate a broad spectrum of coping mechanisms, including environmental strategies, against the backdrop of climate and economic shocks prevalent in the region. Through a multivariate probit model, I explore factors influencing households' choice of shock-coping strategies, revealing that larger households with more assets tend to reallocate labor, whereas those headed by females or older individuals are more inclined towards seeking external support. Surprisingly, we observe minimal reliance on harvesting forest products during shock events. Furthermore, our study delves into households' perceptions of coping strategies through hypothetical shock scenarios, highlighting that collecting environmental resources ranks low in perceived importance for both idiosyncratic and covariate shocks. These findings underscore the nuanced nature of households' adaptation strategies, which encompass diverse approaches such as asset sales, social network reliance, and consumption reduction. Contrary to previous research, our results suggest that forests and environmental resources may not hold as significant a role in coping mechanisms as previously presumed. In elucidating these dynamics, our research not only contributes to a deeper understanding of rural households' resilience but also provides insights that can inform more targeted interventions and policies aimed at bolstering adaptive capacities in vulnerable communities. Perhaps the observed minimal reliance on environmental resources in this study, as compared to earlier research in developing countries, could be attributed to the increased degradation of forests in rural areas, rendering these resources no longer a viable option for household livelihoods during hardships.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

317

The limits to timber traceability: mapping origins from a decade of implementation in Pará, Brazil

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Abstract

Timber extraction is a key proximate driver of forest degradation in primary and naturally regenerating forests across the Amazon. Yet we still lack elementary understanding of the supply-chains that link consumers across the world to timber extraction and associated socio-ecological impacts. Here we use data from Brazil's systems for licensing, origin control and commercialization of timber products (timber transport data and logging permits substantiating these), as well as remote sensing-derived data on forest disturbances due to logging, to assess the extent to which timber products can be traced to origin, facilitating assessments of legality and sustainability. We focus on the case of Pará – a top timber producing state in Brazil and contested forest frontier – using data for the period 2009-2019 to quantify connection between reported activities (i.e., volume commercialized, area authorized for extraction) and observed forest activity (i.e., area of forest exploited). While nearly all roundwood entering the supply chain in this period can be linked to existing logging permits, about half of the volume can be connected to a polygon that delineates an area authorized for logging and 42% to coordinates only. When looking at the forest area identified as exploited (through remote sensing), only 22% of all areas mapped in the period spatially overlaps polygons of authorized areas. An additional 23% can be connected to logging permits we can only geolocate with coordinates, with the remaining subject to a complex patchwork of accountability (and the lack thereof). We highlight that having a well-delineated polygon does not guarantee the volume is fully traceable just as having only a coordinate does not imply a lack of traceability. Nonetheless, limitations exist for linking such volume entering the supply chain and associated exploitation. By documenting limitations of the existing traceability systems, this study provides inputs to the debate surrounding the effectiveness of existing environmental regulations in Brazil, identifying loopholes in existing systems that need to be addressed in order to improve policy implementation. It also provides practical insights on how shortcomings in transparency and data quality of existing traceability system can be overcome to help identify illegality risks and sustainability shortcomings.

Primary FLARE Theme

Forest governance from local to global

Student Level

Ph.D.

319

ASSESSMENT OF AFFORESTATION PRACTICES AMONG SELECTED SECONDARY SCHOOLS IN ABEOKUTA SOUTH LOCAL GOVERNMENT AREA OF OGUN STATE, NIGERIA

Akinyode Olawumi

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Abstract

The study investigates the afforestation practices among selected secondary schools in Abeokuta South Local Government Area of Ogun State, Nigeria. Five Secondary Schools were purposively selected to cut across both rural and urban locations. In each of the schools, 18 Senior Secondary School Three Students, the Principals and Agricultural Science Teachers were selected and interviewed with structured questionnaire. Data generated were collated and analyzed using descriptive statistics in the form of frequency tables and percentages. The results show that a greater part (55%) of the respondents are males, of which 80% are aware of afforestation programmes in their school's environment while a higher percentage (77.78%) of the respondents are familiar with afforestation practices with greater percent (66.67%) of the student participating in tree planting. The principal tree species grown in the schools surveyed are Gmelina, Teak, Neem, Guava, Citrus, Oil Palm, Gliricidia and miscellaneous trees and edges. The reasons for planting trees in the schools includes environmental maintenance, provision of shades for relaxation, supply of foods medicinal plants, etc. The major problems facing afforestation activities among secondary schools in Abeokuta South Local Government Area of Ogun State are inadequate finance, unavailability of planting materials and facilities and inadequate government supports (13.16% each), Unavailability of land (10.53%), inadequate government policies, lack of subject matter specialists and incidence of wildfires and encroachments (7.90% each) and inadequate awareness among stakeholders (5.26%) respectively. The study concludes that the respondents are aware of the fact that tree planting has a vital role to play in the life of man and his environment and recommends mandatory tree planting in all schools in the study area; Ministry of Forestry should provide seedlings at subsidized prices to schools as impetus to tree planting initiatives; Government should support the schools with funds and the materials needed to expand the tree planting and consequently forest reserve in the state; Wood-based Cottage industries should be established for processing of available products and on hands learning for forest professionals and students; and more land should be acquired to expand the existing forest reserves in the state for revenue generation.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

322

Five lessons to avoid failing at scaling in conservation

Thomas Pienkowski[1], Arundhati Jagadish[2]

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Abstract

Many attempts to scale conservation actions have failed to deliver their intended benefits, caused unintended harm, or been later abandoned, hampering efforts to bend the curve on biodiversity loss. This presentation summarises conclusions from a series of online workshops discussing the challenges of scaling effective and equitable conservation action. This presentation encourages those calling for scaling to pause and reflect on past scaling efforts, which offer valuable lessons: 1) the cumulative impact of an action depends on both its effectiveness and scalability; 2) effectiveness can change depending on scale for multiple reasons, 3) feedback processes can change the "rules of the game" for future adoption, and 4) pressures to scale can incentivise unethical and counter-productive scaling practices that undermine long-term outcomes. Cutting across these themes is the recognition that 5) monitoring scaling can enhance evidence-informed adaptive management, reporting, and research. Reflecting on these five lessons may help scale effective and equitable conservation actions to meet the triple goals of reversing biodiversity loss, mitigating climate change, and supporting human well-being.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

323

Assessing security of land rights among women in Caquetá, Colombia using mixed methodologies

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Abstract

Weak land rights is one of the leading causes of tropical deforestation. The department of Caqueta in the Colombian Amazon has led the country in hectares of deforested land in recent years, and has been impacted heavily by the internal conflict for the last several decades. Due to the conflict and the difficulty of collecting up to date land data in rural areas, data on land tenure and land prices are inaccurate and outdated. This research took a multi-pronged

approach by collecting both quantitative data on land parcels, tenure type and prices, as well as perceptions on tenure security and land use decision-making processes. Data was collected through 450 surveys, 109 individual interviews with both men and women, as well as through three focus groups with women leaders in Caqueta. Data collection took place from March 2021 to March 2024. Surveys and interviews were primarily carried out by local partners. The focus group methodology was co-designed with the author and Corpomanigua, a local organization focusing on the cultivation of a dignified life, human rights and gender equality in the department of Caquetá. Preliminary results have found that women have less secure land rights than men, although those who have experienced a previous displacement were more likely to perceive their land tenure rights as insecure regardless of gender. Women are also more likely to value conservation and the cultivation of a range of native Amazon species than men. Causes of insecure land tenure include location of farm, previous forced displacement, informal land tenure holdings, and the lack of land tenure policy implementation.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Ph.D.

328

Developing a tool to support nutrition-oriented tree planting projects in Malawi

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Abstract

Poor quality diets are the leading contributor to global morbidity. One in three people suffer from a form of malnutrition, with the bulk of the burden felt in low- and middle-income countries. In research and policy domains, trees are gaining increasing recognition as important sources of nutrient-rich fruits and leafy vegetables – with a growing evidence base for how forests can support dietary quality. In Sub-Saharan Africa, although many countries are adopting broad-scale landscape restoration initiatives (e.g. AFR100) to support climate change mitigation, few large tree-planting schemes include a nutrition focus. Rather, NGOs and extension agencies are more likely to prioritize fast-growing tree species such as eucalyptus and pine, neither of which have any nutritional benefits for communities.

To support tree-planting initiatives with co-benefits for climate change mitigation and nutrition, we are developing a "Forest and Trees Toolkit" for NGOs and extension agencies. To create the toolkit prototype, we used our existing data on nutrition, poverty levels and agricultural practices for more than 500 households from four disparate study areas in the North and South of Malawi. This data helped us

identify a) seasonal trends in micronutrient deficiencies, b) common tree species on farms and in forests that provide micronutrient-rich foods, and c) supplementary uses for these trees beyond direct provision of food (e.g., nitrogen-fixing properties, water retention properties, wind block, wood for household tools, animal fodder). Adapting the "fruit tree portfolio" approach from McMullin et al. (2019) at World Agroforestry (ICRAF), we will use this data to develop site-specific recommendations for nutrition-oriented tree-planting projects. Through testing this prototype with stakeholders in Malawi, our aim is to develop a toolkit that can be scaled to other countries in East Africa across various biophysical and social contexts.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

331

Examining the influence of customary forest tree ownership on household participation in forest management activities in Jharkhand, India

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Abstract

In India, while the forestland belongs to the federal and state governments, tribal communities possess customary ownership over specific trees located on these forestlands. This study investigates the intricate relationship between households' customary ownership of forest trees, including their sociodemographic characteristics, and their participation in participatory forest management (PFM) activities in two tribal villages in Jharkhand, India. Focused group discussions, household interviews/surveys, and Participatory Rural Appraisals (PRA) were used to collect the necessary data. Our findings revealed that tribal communities have developed a set of socio-cultural norms to govern customary ownership over tree rights. Additionally, we observed a significant variation in the distribution and proximity of trees under customary ownership in two study villages. Dhawadangal had a higher diversity of tree species located closer to houses with fewer trees under customary ownership compared to Sahritola, where lower tree species diversity was observed, located away from the houses but with a significantly large number of trees under customary rights. Asan (*Terminalia elliptica*) emerged as the dominant species in Sahritola due to its cultivation for commercialized tasar silkworms, while Mahua (*Madhuca indica*) remained predominant in both villages, reflecting its economic importance to local livelihoods. Using multiple linear regression analysis, we found a statistically significant, yet relatively small, negative relationship between tree ownership and PFM participation. However, additional factors like education level, household composition, land ownership, displacement history, and economic status emerged as stronger predictors of overall participation. These findings contribute to a broader understanding of how customary ownership over forest trees influences PFM activities, highlighting the importance of considering customary ownership over forest trees along with socio-economic dynamics in designing effective forestry policies. By recognizing the significance of customary forest tree ownership, we can design inclusive and effective PFM programs that foster

sustainable forest management while ensuring the livelihoods and well-being of indigenous communities.

Primary FLARE Theme

Forest governance from local to global

333

From Local to Global: Voices-to-Action Dialogue-based Approach to Materialize the Multidimensional Value of Forests

Armando Valdés-Velásquez[1,2], Tatjana von Steiger[1], Gabriela Wiederkehr-Guerra[1], Rodrigo Medina-Franco[2], Miguel Saravia[1]

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Abstract

As complex socio-ecological systems, forests face simultaneous and interconnected challenges: environmental degradation, cultural disruptions, economic pressures, and inadequate policies that jeopardize their sustainable future. In addition, historical power asymmetries, the marginalization of local/indigenous communities, and a focus on resource exploitation have hindered potential roadmaps towards achieving sustainable forest management.

FLARE's theme of "Imagination and Innovation" inspires our session. We have developed a novel approach to address the challenges mentioned above: The Wyss Academy Dialogues with Purpose (WADs). WADs foster evidence-based, multi-stakeholder dialogues focused on understanding challenges and co-creating potential solutions concerning the interphase between nature and people. Furthermore, they amplify a bottom-up approach with individual regions harbouring dialogues that will ultimately feed into a global conversation and discussion.

During the first half of 2024, we will hold four regional WADs (i.e., South America, Southeast Asia, Eastern Africa, and Europe) on the True Value of Forests. These dialogues will unite diverse stakeholders, including marginalized voices, to construct an improved understanding of forests and co-create actionable solutions that materialize forests' intrinsic and extrinsic values for nature and people.

Our session, in preparation for the global WAD, will showcase the findings of these regional WADs using non-traditional methods to foster horizontal learning and knowledge exchange. It aims to enhance discussions on how the WADs' findings can inform future global and local forest management practices and further our understanding with novel voices and opinions from the FLARE participants.

Primary FLARE Theme

Forest governance from local to global

334

"Karuara, People of the River"

Mariluz Canaquiri Murayari [1], Stephanie Boyd[2] and Andrea Vasquez Fernandez[3]

[1]Federación Huaynakana Kamatahuara Kana. [2]Quisca Productions. [3]University of British Columbia

Abstract

As part of collective efforts to protect the Amazonian rainforest and the rich interrelations that have been forged over thousands of years but that are in danger today, Indigenous Peoples are positioning themselves on the frontlines of environmental defense. These struggles are strengthened by support from other sectors of civil society and academia, weaving together different technologies. This session will include the European premier of a collaborative community documentary led by the Federation of Women of the Kukaura People, the local radio station Kumara, and the filmmaker Stephanie Boyd.

https://vimeo.com/844665717

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

336

Addressing Data Gaps and Challenges for Measuring Forest-based Climate Adaptation

Danielle Wood[1], Karen Bailey[2], Amy Duchelle[3] and Daniel Miller[1]

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Abstract

Climate adaptation that addresses challenges to forest livelihoods in a changing climate while concurrently supporting adaptation of forests themselves is an urgent global challenge. Investment in this critical domain, however, has been frustrated by a lack of sufficient information regarding progress on building adaptive capacity and adaptive practices. The Forests & Livelihoods: Assessment, Research, and Engagement (FLARE) Network, with its expertise across research and praxis, is especially well positioned to address this information gap and help develop indicators to capture the contribution forests and tree-based systems make to adaptive capacity and resilience to climate change.

This project will leverage the expertise gathered at the annual FLARE conferences (2024 in Rome; 2025 in Belem) and strategic engagement with FAO and the Notre Dame Global Adaptation Initiative (ND-GAIN) to make progress toward these information and indicator goals. The 2024 meeting (October 3-7)

will include an Innovative Session (October 6) that describes the current data landscape and begins to identify key data and indicator needs and opportunities, followed by a Workshop to identify potential key performance indicators for adaptive capacity related to forests, tree-based systems and livelihoods, strategize measurement approaches, and seed the development and infrastructure to support and produce metric(s) addressing this gap.

Primary FLARE Theme

Forest and trees in a just climate transition

339

Creating New Forestry Markets is a Team Effort: Building Connections & Knowledge-Sharing Amongst Diverse Stakeholders in the U.S. Southern States

Dr. Leslie Boby

University of Georgia

Abstract

Nearly 90% of forestland in the southern United States is privately owned, but 100% of it provide public benefits, however, a lack of markets for forestry products contributes to risks of forestland conversion. While increasing demand for new forest products is one part of the process of creating new forestry markets, there are extensive logistics and teamwork that is needed to develop new or expand existing mills to process timber. Creating or expanding new mills is the culmination of work done by forestry stakeholders as well as economic developers, local leaders and more. Each have their own knowledge that contributes to the process, but there is often a gap between the two, where each may not be aware of how to connect with each other or the assistance that could be offered. Ongoing retirements and employee turnover across multiple organizations also threaten existing connections amongst these stakeholders. Learn about efforts to identify these challenges and bridge these knowledge gaps in an action research project and study. We worked to create new connections through a series of interventions including hosting cross-sector meetings, creating a Community of Practice and more that led to increases in trust, knowledge-sharing and greater social capital amongst these stakeholders. This project and study generated awareness of this issue, and has led points of connections across these stakeholder groups is important for ensuring that institutional knowledge is retained and relationships are maintained, even when individuals retire or move on to new positions.

Primary FLARE Theme

Teaching and learning on forest livelihoods

341

Pathways through which forests contribute to rural food security: Evidence from Odisha, India

Amrutha Jose Pampackal

Cornell University

Abstract

The dominant discourse on food insecurity focuses on agricultural production as the solution to food insecurity. Such an approach overlooks the fact that majority of the world's rural population resides near forests, thus making forests important for rural food security. Despite the growing literature on forest–food security linkages, significant gaps remain in our understanding of forests' contribution to food security. Many studies emphasize forests' role in enhancing food security primarily through the consumption pathway (provision of wild food), while alternative pathways such as provision of income and ecosystem services are often overlooked. Additionally, forests' role as a food source is often not analysed in comparison to other sources like markets and agriculture. To address this gap in literature, I present an integrated analysis of the diverse pathways through which forests, in comparison to other sources, influence women's dietary diversity. Special emphasis is placed on the direct consumption and income pathways, while other pathways are addressed to a lesser extent.

The data for this study comes from one year of fieldwork that I conducted in 2021-22 in Thuamul Rampur, a highly forested rural area in Kalahandi district of Odisha, India. To understand the pathways through which forest's contribute to women's dietary diversity, 440 households were surveyed during the rainy season. Since quantitative data alone is not adequate to capture the complex mechanisms that shape each pathway, various qualitative methods were also used.

The study found that forests significantly enhanced women's dietary diversity through the consumption pathway, with each additional food item consumed from the forest having a greater association with dietary diversity compared to those from market and agricultural sources. Furthermore, consumption of forest produce was higher for women living in villages where community forest rights (CFR) was recognised, regardless of their awareness of these rights. However, there was no evidence supporting the income pathway. Qualitative findings indicated that the realisation of the income pathway was affected by ambiguities regarding CFR and absence of well-functioning markets. The study suggests that implementation of policies recognising community's rights over forest resources can potentially strengthen forest–food security linkages in a sustainable manner.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

Tenure, FLR, and Gendered Social Norms in Cameroon and Madagascar

Elisabeth Garner, Anne Larson, Rebeca McLain, Patrick Ranjatson, Abdon Awono, Renaud Randrianasolo Andrisoa Nomenjanahary, Stephane Guylou Mvaebeme, Philippe Guizol, Michel Ndoumbe

Abstract

Achieving global restoration goals requires the consideration of gender equality and rights. Land tenure is a critical pathway and resource to both restoration and gender equality, as is equal participation in, decision-making, and benefit sharing in forest and landscape restoration activities. As such, understanding and addressing the gendered social norms and invisible barriers to access, use, and control over land and forests are critical to successful FLR projects.

Madagascar and Cameroon present two case studies where social norms contextualize the link between tenure security perceptions and FLR adoption, at the individual, household and community levels. Gender norms can also be expressed and experienced differently across contexts, genders, life stages, and country contexts. As such, we analyze a household survey to consider the relationship between gender social norms specific to FLR and tenure to understand the social infrastructure shaping potential FLR initiatives, comparing between Madagascar and Cameroon, disaggregating by gender and age.

This research shows the importance of considering gender differences not only in actions, but also in beliefs, that influence environmental engagement and interactions. These findings also directly tie into practical considerations for the design of forest and landscape restoration activities and community engagement, as demonstrated by the Tenure, FLR, and Livelihoods Toolbox.

This research integrates recent interest in gender norms by capturing and addressing the underlying causes of social inequalities through gender transformation into the forest and landscape restoration and tenure dialogues, while also expanding the conversation on gender norms by considering their expression specifically in relation to natural resources. This two-way integration and conversation between gender development and natural resources fosters innovative solutions to both climate change and social inequality. McLain&Larson_Panel

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

343

Participatory Mapping Reveals Conflicting Perceptions of Fire Drivers: Implications for Conservation Management

Elliot D. Convery-Fisher, Adam Devenish, Sam Staddon, Fehizoro Laura Rafanomezantsoa and Caroline E. R. Lehmann

University of Edinburgh

Abstract

The increasing frequency of extreme wildfires worldwide, driven by climate and land-use changes, poses significant risks to biodiversity and human well-being. In Madagascar, a conservation hotspot, historical fire management strategies have been ineffective, necessitating an exploration of diverse stakeholder perspectives to develop adaptive and culturally sensitive fire management.

This study utilised fuzzy cognitive mapping (FCM) to explore stakeholders' perceptions of fire drivers in the Ambatofinandrahana district of Madagascar. We developed an empirical basis for comparing perceptions across stakeholder groups through participatory cognitive mapping with 133 stakeholders from five distinct groups.

Stakeholders identified nine central variables influencing uncontrolled grassland fires, highlighting the multifaceted nature of fire drivers, including pasture burning, arson, agricultural fire, accidents, poor local services, law enforcement, cattle rustling, environmental context and local fire management.

Highlighting the active role of variables such as cattle rustling, poor services, and weak institutions in driving fires suggests a shift in focus from criminalising local livelihoods to addressing underlying socio-economic, ecological and cultural dimensions of fire use.

Stakeholder views revealed distinct clusters that showcase competing knowledges over perceptions of fire drivers.

This research provides a novel quantitative insight into the complex perceptions surrounding fire management among stakeholders in Madagascar. Making stakeholder perceptions explicit underscores a management need to integrate diverse stakeholder perspectives through collaborative processes to develop sustainable and effective fire management strategies that respect local livelihood needs, community structures and ecological conditions. The findings have broader implications for natural resource management, suggesting that engaging with and integrating multi-stakeholder perspectives is critical for crafting sustainable global solutions.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

Student Level

PhD

345

Inter-sectoral dependencies and tradeoffs of the global land rush: implications for household health and livelihoods

Marc F. Müller[1], Julie Faure[1], Leonardo Bertassello[2], Davide Danilo Chiarelli[3], Kyle Davis[4], Jampel Dell'Angelo[5], Paolo D'Odorico[6], Bokhtear Khan[4], Maria Cristina Rulli[3]

[1]Eawag, Switzerland. [2]University of Notre Dame, USA. [3]Politecnico de Milano, Italy. [4]University of Delaware, USA. [5]VU Amsterdam, The Netherlands. [6]UC Berkeley, USA

Abstract

The last two decades have seen a fast escalation in transnational land investments due to the combined effects of recent global economic and food price crises, the adoption of new bioenergy policies and trends of water and land commodification. This global land rush is favoring a dramatic transformation of rural landscapes in low and middle income countries, with smallholder farming being displaced by large-scale commercial agriculture. This transition involves critical tradeoffs at the nexus of food, energy, water and the environment, where the effort to meet expanding global food and energy needs must be balanced against local impacts on health, livelihoods and ecosystems. Several recent studies have characterized the food, water, energy and environmental security impacts of land acquisitions but tradeoffs across sectors and their implications for household health and livelihood are poorly understood. We fill these gaps by building on several previous analyses of sectoral impacts carried out on a unique globally representative sample of 160+ georeferenced land deals. These results will be synthesized to characterize the extent to which impacts are correlated across sectors. We will develop an unsupervised classification approach borrowed from Machine Learning to identify a finite number of "archetypes" of land deals based on their cross-sectoral tradeoffs. We will then map this "top down" analysis of cross-sectoral impact to a "bottom up" analysis of household outcomes using Demography and Health Survey data obtained for 5000+ households in the vicinity of land deals. We will determine whether each archetype of land deal is associated with specific combinations of household-level implications in terms of livelihood and health. We expect the outcome to provide nuanced insights to inform targeted policies to regulate transnational land deals in support of a sustainable and just agrarian transition.

Primary FLARE Theme

Human well-being, poverty and forests

346

Impact of Forest Plantations on Energy Poverty: An Assessment of Reforestation Efforts in Uganda

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[1]University of Manchester, UK. [2]University of Montana, Montana, USA

Abstract

This study investigates the socio-economic impacts of reforestation initiatives on energy poverty in three Ugandan districts—Hoima, Dokolo, and Nakasongola. Implemented by the Ugandan National Forest Authority, these efforts aim to mitigate the adverse effects of deforestation, exacerbated by a growing population and increased demand for forest products. We hypothesize that through sustainable afforestation, access to biomass and other renewable energy sources can be improved, thereby alleviating energy poverty. The study establishes a causal relationship between reforestation and reductions in energy poverty and general poverty using advanced econometric methods, such as

Ordinary Least Squares regression, Weighting, and matching techniques including Propensity Score Matching and Nearest Neighbor Matching. This approach significantly deviates from traditional methods which rely predominantly on descriptive statistics, and it utilizes primary data from survey fieldwork and secondary data from the 2014 Uganda National Population and Housing Census. Key explanatory variables include species of plantation and the plantation stage—categorized as Harvested vs Not harvested.

The theoretical framework associates mature (Harvested) plantations with lower energy poverty due to stable biomass supply. The analysis employs four indices to assess the impacts: two Multiple Correspondence Analysis (MCA) indices and two Multidimensional Poverty Index (MPI) indices. The energy poverty index, a multidimensional index, includes variables such as the type of cooking fuel, access to electricity, and household appliances. The general poverty index accesses broader health, living standards, and education metrics. Preliminary results show the harvested stage notably decreases energy poverty, emphasizing its role in reforestation and poverty reduction. The impact of other plantation stages varies, with household characteristics and socioeconomic factors significantly influencing energy poverty levels.

This research contributes to forest plantations' multifaceted role in addressing energy poverty and highlights the necessity of integrating energy policy with sustainable forestry management. The findings are geared towards assisting policymakers and stakeholders in formulating strategies that balance environmental sustainability with reducing energy poverty, especially in developing countries like Uganda. These insights and recommendations are also relevant for similar initiatives in other contexts.

Primary FLARE Theme

Human well-being, poverty and forests

Student Level

Ph.D.

347

How much cash do households in Zambia save by collecting and consuming wild foods?

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Abstract

Introduction

Wild foods can improve household wellbeing through their contributions to nutrition, and also from the cash that households save by foregoing expenditures on food. Using data from a national survey on wild food collection and consumption in Zambia in 2021, we estimate the cash expenditures saved by Zambians through collection and consumption of wild foods.

Methods

We use data from a nationally representative survey of Zambian households carried out by the Center for International Forestry Research - World Agroforestry Center in partnership with the Zambian Statistics Agency in 2021. The survey collected information on the quantities of the wild foods most collected in eight categories (fruits, vegetables, mushrooms, tubers, insects, nuts/seeds, fish, aquatic plants) from 2,893 households across the country. Using the data from the survey and 2021 prices from the Zambian Statistics Agency for the least expensive comparable foods within each category, we estimated the minimum households would have had to spend to buy 'similar' foods.

Findings

Participation rates for collection of all wild food types was quite high overall but varied substantially across both provinces and products. Ninety per cent of rural households collected at least one wild food in 2021. Of the foods households reported collecting, we were able to identify 259 unique products. If households had purchased 'equivalent' foods, they would have spent an average of ZMW 49,187 in 2021 ($2,459). This figure far exceeds annual Zambian household cash expenditures on food in 2021, which were about $1,099. The biggest contributor to foregone expenditures was from freshwater fish which had the highest unit cost and comprised more than half of the total savings ($1500), followed by mushrooms ($368), nuts/seeds ($274) and insects ($187).

Conclusions

This study underscores the importance of wild foods in Zambia for household wellbeing. They directly contribute to household food and nutrition and save households the cash that they would otherwise have spent to purchase equivalent foods. Without access to wild foods, households would either lack the important nutrients in their diet that the foods provide, or they would need to purchase equivalent foods and therefore have considerably less disposable income to use for other expenditures. "

Primary FLARE Theme

Human well-being, poverty and forests

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Informality, ambiguity, and corruption in forest and resource governance: Insights from Mexico, Indonesia, and Peru

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Abstract

Corruption in forest and resource governance is frequently difficult to detect due to the clandestine, intricate, and obfuscated methods by which land-use decisions are frequently reached. The conventional definition of corruption, which refers to the misuse of entrusted authority, does not always align with the processes by which individuals negotiate access to power and resources. These negotiations occur through both formal and informal rules and institutions, involving actors who hold varying levels of power and authority. We have gathered empirical qualitative evidence by conducting interviews and focus group discussions with various actors in Mexico, Indonesia, and Peru. This article focuses on frequently overlooked mechanisms of land-use decision making that involve the misuse of entrusted authority, but are not exclusively limited to corrupt practices. We contend that clientelism, influence peddling, and land-trafficking are manifestations of corruption. We advocate for a more expansive understanding of corruption by examining the connection between corruption and the violation of laws in the management of forests and resources. It is important to recognise how non-penalised forms of abuse of entrusted power are deeply embedded in wider governance processes and can work to undermine democracy and accountability.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

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Mangroves and Small-scale Fishers' Livelihoods in Indonesia

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Abstract

The contributions of mangroves to climate change mitigation and biodiversity are better known than their role in providing livelihoods for local communities. Indonesia is home to nearly a quarter of the world's mangroves. Mangrove ecosystems support aquatic animals consumed by local communities contributing to the productivity of Indonesia's fisheries sector. Indonesia's extensive coastline and rich marine biodiversity make it one of the world's leading fish-producing nations, with fisheries playing a pivotal role in the livelihoods of millions of Indonesians. Our study assesses the livelihood benefit of conserving and restoring mangroves for local communities.

This study focused on two sites in Java (Banyuwangi and Demak) where mangroves have been degraded due to human activities, and restoration efforts have been taking place over the last 20 years. We conducted a livelihood survey to assess the contribution of mangrove ecosystems to the livelihoods of 471 mangrove-fisher households from February to May 2022. We found that mangroves provide wide opportunities for small-scale fishers. By providing shade and shallow fishing grounds as well as by

reducing wave energy, mangroves allow for shorter fishing trips resulting in lower investment in fishing gear compared to fishers who must travel further out in the ocean. This facilitates small-scale fishers' involvement because they do not to make large investments in boats and gear. The study documented high diversity of fish and other aquatic animals with 71 species caught by respondents throughout the year. On average, mangrove fishers caught 2.3 species per trip, with a total catch estimated at around 9.3 kilograms per trip. Mangrove-related fisheries activities contributed more than 50% of total household income in both regencies. Annual profits from mangrove fisheries products ranged from USD 4,230 - 5,635 in Demak and USD 2,736 - 4,629 in Banyuwangi.

Our findings suggest that aquatic animals from mangroves contribute substantially to the livelihoods of the local communities in Banyuwangi and Demak. Considering the important role of mangrove ecosystems in supporting sustainable livelihoods in coastal communities, conservation and restoration of mangroves should be recognized as safeguarding both biodiversity and local community welfare.

Primary FLARE Theme

Human well-being, poverty and forests

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The Contribution of Wild Animal Source Foods to Nutritional Needs of Indigenous Women in Indonesia

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Abstract

Indonesia's landscapes are distinguished by extensive forest cover, accounting for more than half of the country's land area. Forests play important roles in local food systems, providing food for people living in proximity to forests. However, the high rates of primary forest loss in Indonesia threaten the availability of nutritious wild foods. We aim to understand the potential impact of forest degradation on the food security and nutrition of vulnerable forest communities through an assessment of the contribution of wild animal source foods (wild-ASF, including meat, fish, and insects) to the nutritional needs of indigenous women of reproductive age in West Kalimantan (n=413) and Papua (n=403) Provinces of Indonesia.

Through data collection and analysis of 24-hour dietary recall data, we found that wild-ASF, particularly local fish, significantly contributed to the nutrient intakes of women in both study sites, with those consuming local fish exhibiting significantly higher intakes and better fulfilment of their daily nutrient requirements for protein, iron, zinc, vitamin B12, calcium, and phosphorus compared to non-consumers.

While wild-fish consumption was prevalent in both sites, wild meat consumption was particularly high in Papua. In Papua, nutrient intake from wild meat significantly contributed to the daily requirements of protein, iron, zinc, vitamin B12, calcium, and phosphorus for wild meat-eating women, surpassing those of non-wild meat eaters. These essential macro and micronutrients play a critical role in preventing anemia, strengthen immune responses, and support the growth and brain development of fetuses.

Our findings highlight the valuable contributions of wild-ASF in supporting women to consume required intakes of several key nutrients. While local fish played a crucial role in enabling women to meet various nutrient requirements in both sites, wild meat consumption only played a crucial role in Papua. As deforestation threatens the availability of wild foods, forest conservation and restoration should be prioritized to protect these accessible and nutrient-dense animal source foods that are dependent on healthy forests.

Primary FLARE Theme

Human well-being, poverty and forests

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Over-reliance on land for carbon dioxide removal in national climate pledges

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Abstract

Achieving net-zero climate targets requires some level of carbon-dioxide removal. Current assessments focus on tonnes CO2 removed, without specifying what form these removals will take. Here, we show that countries' climate pledges require approximately 1 (0.92-1.1) billion ha of land for removals. For more than half of this area, the pledges envisage the conversion of existing land-uses to forests, while the remaining is for ecosystem restoration. We analyze how this demand for land is distributed geographically and over time. The results are concerning, both in terms of the aggregate area of land, but also the rate and extent of land use change. Our findings demonstrate a gap between governments' expected reliance on land for mitigation purposes and the role that land can realistically play. This indicates a need for more transparency around the role of land in national climate mitigation plans.

Primary FLARE Theme

Forests and trees in a just climate transition

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Conserved forest and threatened forest biodiversity: analyzing biodiversity outcomes in Nepal's community forests

Lila Nath Sharma

Abstract

Community forestry program of Nepal is a successful model of decentralized forest governance. The program has made a visible contribution in improving forest cover, increasing tree density and restoring degraded forest. While increase in forest cover and tree density has been equated as biodiversity conservation, scholars have questioned biodiversity outcomes in community forests. In addition, despite passive management, community forests have prioritized few major timber species against the multipurpose nature of forest-people interaction. In this context, combining forest biodiversity data across various groups of plants and animals, in situ interview of forest leaders and local people, review of forest management plans and observation of routine management activities in 22 Sal dominated community forests in lowland of Nepal, we analyzed how existing management in community forest support biodiversity conservation and multipurpose forestry. Our results show that while community forests have important role in protecting the forest, they have failed to acknowledge the richness of biodiversity and multifunctional nature of forest. Management plans and specific actions are guided by broader political narratives around economic growth and prosperity, and traditional dependence of local people are overlooked. We discuss how specific features of forest biodiversity are underappreciated in management plans and silvicultural interventions, and preferential protection of timber species exists even in passive management. We underscore that contribution of CF in biodiversity outcomes depends on what attributes of forests are considered as biodiversity. We highlight need for better data and incentive to communities to conserved biodiversity in community forests.

Primary FLARE Theme

Forest landscape restoration: challenges and opportunities

353 Cooperation from PPPs against deforestation in Viet Nam

Pham Thanh Nam

SNV

Abstract

SNV has been implementing the (IKI funded) Café-REDD project in Vietnam's Central Highlands since 2018. This project aims to support sustainable development, and reduced forest loss and degradation, in the landscape around the Lang Biang Biosphere Reserve. This is an important and iconic forested landscape, but it is under threat from coffee and the agriculture sector more widely – historically, these have contributed to >70% of forest loss.

The project was designed to integrate Public and private partnership efforts to reduce the negative pressures on forest by supporting sustainable agricultural development and local job creation and

livelihoods. As a result, forest cover in the project's district has ceased at 85%, over 2,853 hectares of monoculture coffee plantations have been transformed into sustainable agroforestry models, engaging over 3,355 rural upland smallholder farmers. This transition owes much to the traceability system and its ability to provide added value for stakeholders, now adopted by 15 companies and seamlessly integrated into the district's intelligent operational centers. Coffee producers benefit through higher revenues due to sustainability certifications and increased market share through compliance with the EUDR.

However, lack of capital and access to credit by farmers and enterprises threatened the longer-term durability and upscaling of the farming models. By combining SNV's on-the-ground experience with some further research, SNV identified opportunities where the project could make a meaningful impact on improving access to finance from several sources and secure the sustainability and enhance the scalability of the project's approach:

1. Leading creation of an integrated "climate-smart landscape investment plan" for the district.
2. Supporting development of a new "livelihood and forest protection fund" which was established as non-governmental entity to be a highly innovative blended finance vehicle.
3. Creating an accelerator fund for small businesses which provided a combination of technical training and support and catalytic small grants.
4. Establishing partnerships with banks to enhance provision of credit to different sub-segments within the project's target audiences by credit scoring and conducted the banks' Know Your Customer and due diligence processes on farmers.
5. Training and support to farmer groups and cooperatives that the project has worked with to access other existing financial resources such as public grants or commercial lending.

Primary FLARE Theme

Imagination and Innovation for Forest Livelihoods (main theme)

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Harvesting of Forest Products is Widespread Among Culturally Distinct Farmers in the Eastern Amazon

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Abstract

Forest product harvesting is carried out by distinct human populations in biodiversity-rich tropical forests. Amazonian indigenous peoples, for example, have harvested forest products for at least 13,000

years. Plants and animals are used in their daily lives, as food, medicines and other uses. However, a broad range of cultural groups, ethnicities and livelihoods coexist in Amazonian landscapes, from indigenous, ethnically mixed traditional communities to smallholders, as well as medium to large commodity farmers. While indigenous and traditional community livelihoods are often based on diversified activities, from shifting agriculture, to fishing and non-timber forest product (NTFP) harvesting, more industrialized medium to large scale farmers (220ha to >1,000ha) frequently cultivate a single crop (soybean, pasture). We compared the harvesting of forest products among these different types of rural actors and investigated its driving factors. We leveraged a dataset from the Sustainable Amazon Network, obtained through interviews with 623 households in 460 farms in Eastern Amazonia. We found some NTPFs were harvested by more than half of the households: piquiá (Caryocar villosum) (57.95%), bacaba (Oenocarpus bacaba) (54.92%), Brazil nut (Bertholletia excelsa), and fibers from different palm species (54.03% for both). The number of collected products (1 to 11) and intensity of harvesting per household were positively associated with forest cover and size of the properties. This means that unexpectedly, smallholders collected relatively fewer products and had lower harvesting intensities probably due to the combination of low density of plants, smaller forest areas and reduced harvesting capacity. Medium to large farmers had moderate to high intensities of extraction for açaí (Euterpe oleracea), bacaba (O. bacaba), uxi (Endopleura uchi), Brazil nut (B. excelsa), as well for rubber (Hevea brasiliensis) and fibers. Our novel findings show that the harvesting of NTPF in such forested landscapes is not restricted to traditional communities. This suggests possible leverage points in conservation programs exploring the valorization of forests by non-dependent forest peoples. Nevertheless, smallholders are the main harvesters of NTFPs in absolute numbers (383 small, 40 medium and 37 large). Our work reveals a critical need for public policies to support smallholders to improving their livelihoods from forest product harvesting in the Amazon.

Primary FLARE Theme

Human well-being, poverty and forests

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Estimation of above-ground biomass using images from Unmanned Aerial Vehicle (UAV) in a Dry Tropical Forest in Brazil

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Abstract

Seasonally Dry Tropical Forests (SDTF) are areas that experience seasonal droughts due to intense solar radiation exposure, leading to high evapotranspiration rates and irregular rainfall, with a tendency towards desertification. The largest continuous area of SDTF in Brazil is the Caatinga biome, located in the northeastern region of the country. Approximately 46% of its area has been deforested and remains underexplored, with few studies focused solely on forest plot levels. To better monitor the region, the use of new technologies through remote sensing, using satellite and Unmanned Aerial Vehicle (UAV)

imagery, is an excellent yet underexplored alternative in this biome. Through UAVs, it is possible to estimate dendrometric characteristics of the forest, such as tree height and above-ground biomass (AGB). Obtaining this information in regions like the Caatinga is of great importance, especially given the lack of data on the subject in the region. However, making such estimates on a large scale remains a challenge. In this study we will estimate the above-ground biomass and tree height in the Caatinga biome in the state of Pernambuco, Brazil, using two stages: calculating the AGB and height from plots to the UAV images; AGB and height from the UAV to the satellite images. The first reference data will be terrestrial measurements from 60 representative plots of the Caatinga in the state of Pernambuco, and UAV image data from 60 blocks of UAV image data from the same region using Multivariate General Linear Model. Subsequently, the estimated AGB and height will be used for training data using Sentinel 1, Sentinel 2, and Random Forest to extrapolate the measurements for the entire Caatinga biome in the state of Pernambuco. With the obtained results, it is expected to produce high-resolution maps of above-ground biomass and total tree height for an area in Caatinga biome for the first time.

Primary FLARE Theme

Forests and trees in a just climate transition

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Transformation of Shifting Cultivators in Peatlands and Mineral Lands in the Era of Climate Change

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Abstract

The practice of shifting cultivation is a traditional agricultural system still practiced by several communities in the world, including the Dayak tribe on the island of Borneo, Indonesia. Shifting cultivation is often considered an environmentally friendly agricultural activity because it applies local knowledge that is adaptive to environmental conservation. This practice supports the preservation of resources by planting various types of crops (polyculture), conducting controlled burning, and allowing the land to lie 'fallow' to restore soil vertility naturally. However, along with the development of the era and the prohibition of burning, the pracice that has been going on for hundreds of years has become increasingly rare in Indonesia. This study aims to: (1) determine the status of shifting cultivation activities, (2) explore the transformation of the communities involved, and (3) identify the adaptation efforts of shifting cultivation communities. This study is an ethnographic study, conducted in two villages on the island of Borneo, one predominantly peatland and the other in mineral land. We found that the practice of shifting cultivation has been abandoned by the community in peatland since 2005. The communities have attempted to comply with government policies and continue to seek new sources of income. They become vulnerable to climate change and more dependent on various government

programs. In contrast, communities on mineral lands continue to practice shifting cultivation with several innovations, reaping economic benefits, maintain biodiversity, and preserving their ancestral cultural rituals. The scientific significance of this study lies in the in-depth understanding of community adaptation to environmental policies and climate change, and how local innovation can support economic and cultural sustainability. These findings suggest that while zero-burning policies may threaten biodiversity and culture, local innovation can offer a balance solution. In a broader context, the results of this study highlight the importance of policies that consider local knowledge and cultural adaptation in addressing the challenge of climate change.

Keywords: shifting cultivation, forest and livelihoods, adaptation, local innovation

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Conservation and social justice: Socioeconomic Impacts of REDD+ Projects in Colombia

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Abstract

Forests play an essential role in climate change mitigation. The REDD+ (Reducing Emissions from Deforestation and Forest Degradation) initiative was created to mitigate climate change through forest conservation in low- and middle-income countries. With 53.3% of its land territory totaling 59.1 million hectares covered in forests, Colombia has been seen as an attractive site for REDD+ and many projects have been supported under this program. REDD+ projects offer potential environmental benefits, but they also have socioeconomic impacts, particularly on local communities. A growing body of research examines such impacts but has often neglected the varied effects REDD+ projects may have on different types of community groups. This study addresses this gap by examining the impacts of REDD+ projects on three different groups that have been involved in voluntary REDD+ projects in Colombia: Indigenous communities, Afro-Colombian communities, and campesino communities. To do so, it draws on key informant interviews, secondary data, and available published and grey literature. I find that Indigenous, Afro-Colombian, and campesino communities alike have reported unfair treatment, community division, and lack of transparency within the framework of REDD+ projects. Even though the types of impacts are similar, they differ in magnitude and characteristics. This is because these communities are governed by different regulatory frameworks, have various organizational structures, and, most importantly, have distinct historical processes related to land titling and land tenure models. The importance of acknowledging these impacts is to raise awareness of the need of regulating the projects and to address the power imbalances among ethnic and peasant communities and project developers. In conclusion, there are differentiated impacts from developing these REDD+ projects on ethnic and campesino lands. This study aims to contribute to understanding the adverse socioeconomic impacts on these communities, which is essential for effective conservation and social justice.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

Student Level

Master's

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Randomized Controlled Trials for Poverty Alleviation and Environmental Conservation in Low and Middle-Income Countries: A Systematic Review

Adriana Molina-Garzon, Valena McEwen, A. Worku, Lakshmi Iyer, Ellis Adams, Krister Andersson, Daniel C. Miller

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Abstract

An estimated 600 million people still live in extreme poverty worldwide, with the vast majority residing in rural areas of low- and middle-income countries (LMICs). The situation is particularly challenging for people living in forest landscapes where poverty alleviation strategies can undermine the environment. For instance, some efforts to promote economic development (e.g. expanding agriculture) can degrade forest ecosystems, potentially increasing poverty in the long run. In this systematic review, we aim to understand the conditions under which policies and programs seeking to reduce poverty in rural areas also conserve forest ecosystems. We also examine when trade-offs between poverty alleviation and environmental outcomes are more likely.

Our systematic review focuses on evidence from randomized controlled trials (RCTs) on interventions with rural poverty alleviation and/or environmental and forest conservation objectives in LMICs. We consider interventions designed to address poverty alleviation or environmental conservation or both goals simultaneously in rural areas in LMICs. Our inclusion strategy is based on method (RCT), geographical location (LMICs), and outcomes: poverty-related (income, household/individual assets, consumption, living conditions, multidimensional deprivation, agricultural production, non-farm labor) and/or environmental conservation (changes in forest cover, water or soil quality, fires, fire-related behaviors, carbon emissions, and biodiversity loss). These inclusion criteria have yielded 114 relevant studies, including 75 focusing primarily on poverty alleviation, and 39 focusing on environmental conservation. Results indicate consistent and positive effects of cash or asset transfers on household expenditures, food consumption, and labor supply. However, these interventions show mixed results on environmental outcomes. Training or educational programs showed significant effects on households' accumulation of productive assets, but mixed results for conservation; access to microfinance and alternative banking services showed mixed results for welfare. Interventions utilizing payments for ecosystem services (PES) showed positive significant effects promoting conservation practices and reducing deforestation, but these results were not always consistent as they are sensitive to design elements including conditionality or lack thereof, payment size, and timing of payment. Finally, our

search yielded only a few RCT studies of both poverty alleviation and environmental conservation impacts, thus reflecting the need for more causal evidence in this area.

Primary FLARE Theme

Human well-being, poverty and forests

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Innovations and Technology for Forest Governance and Livelihoods: Explore and Imagine with Tenure Facility

Merlyn Hurtado and Margareta Nilsson

The Tenure Facility

The International Land and Forest Tenure Facility (Tenure Facility) is a funding mechanism that partners with Indigenous Peoples and Local Communities (IP&LC) and their allies in 18 countries in Africa, Asia and Latin America to secure their collective land and forest rights. 80% of our current partners are IP & LC organizations.

Our partners have leveraged a diverse array of technological and social innovations to support indigenous and locally based forest governance and management. They are using innovative approaches to address challenges in forest management, community livelihoods, and territorial governance. The integration of technology, traditional knowledge, and collaborative efforts highlights the potential for sustainable and resilient forest and community management. The innovations have accelerated the process of securing forest tenure and governance, and community empowerment. The advancements in mapping, monitoring, and data management have enhanced transparency, efficiency, and accuracy in land claims and forest governance. The inclusion of women and youth in the processes has fostered greater community involvement and leadership.

Moving forward, it is essential to continue supporting technological innovations while ensuring they are inclusive and culturally sensitive. By doing so, together, we can push forward the imagination and innovation needed to secure a sustainable future for forests and the communities that depend on them.

Primary FLARE Theme

Social justice in the forest: Rights, power, and collaboration

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Assessing the Role of Corruption in Deforestation

Khadijat Atere

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Abstract

The effect of corruption on deforestation is still largely in question. Corruption and deforestation are globally complex issues threatening environmental, social, and economic development through illegal logging bribery, and displacement of indigenous communities. Corruption has been identified as an indirect driver of deforestation and understanding the relationship can better inform policies towards achieving sustainable development.

This study builds on existing literature (Barret et al., 2006; Smith et al., 2003, Koyuncu et al., 2009) and examines the complex relationship between deforestation and corruption, specifically, how the perceived level of corruption within a country affects the rate of deforestation.

A stepwise multivariate regression analysis is applied using the Transparency International corruption perception index and Food and Agriculture Organization deforestation data from 2015 to 2020, Assuming heteroskedasticity and controlling for human population density, Gross Domestic Product per capita, and Human Development Index rank, the results show that a significant increase in the corruption index score of countries by 1 point on a scale of 1-100 is associated with an increase in deforestation by approximately 5%.

The results suggested that countries with higher levels of corruption scores are likely to have high levels of deforestation, highlighting the critical need to strengthen governance structure in countries to effectively implement policies and combat deforestation. This calls for further research using methodologies that can arrive at causal impact to effectively estimate the relationship between corruption and deforestation to help guide policy decisions toward sustainable development.

Primary FLARE Theme

Forest governance from local to global

Student Level

Master's