Editorial: Forest transitions: from restoration to conservation and everything in between

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KEYWORDS

Forest Transition Theory, deforestation, reforestation, sustainable land management, human agency, landscape governance

Editorial on the Research Topic
Forest transitions: from restoration to conservation and everything in between

Can something new be said about forest landscape management? We think so, in view of the difficulties we face in stopping and reversing the trend of deforestation and tree forest loss. Something must be missing, and therefore something new must be written.

The Forest Transition Theory (FTT), as introduced by Mather (1992), describes the changes in forest cover as societies undergo industrialization and urbanization. This theory posits a pattern where initially, industrialization and urbanization lead to deforestation, followed by a phase of forest recovery or reforestation. This transition is influenced by various factors including economic changes, shifts in energy sources, state policies, and cultural attitudes toward forests. The FTT generated a lot of discussions and its limitations did not prevent it from helping frame the thinking behind landscape interventions for the past 30 years.

This Research Topic features four articles, each revisiting a specific aspect of forest transitions as they happen. Papua New Guinea and the urgency of proactive conservation planning in the lowland ecoregions is the topic of the first paper (Parsch et al.). The second paper (Jimenez et al.) explores peri-urban forest transitions and the promotion of urban centered policies to shape forest landscapes in Argentina, highlighting the growing role cities can play in supporting or hampering sustainable landscapes. Paper 3 (Bakarr and Abu-Bakarr) proposes a landscape framework for forest conservation, urging protective measures and innovative land use in Sierra Leone. The authors of paper 4 (Pereira et al.) warn against deforestation's impact on soil in regions like the Cerrado, stressing the need for sustainable land management. These contributions illustrate how internal drivers, knowledge application, and rights definition combine with external factors to shape complex landscape management dynamics.

They also highlight a challenge inherent in contemporary forest landscape governance. This challenge is exemplified in the first paper of the Research Topic (Parsch et al.). The authors highlight how industrialization and land-use changes in Papua are driving deforestation. However, through the Manokwari Declaration and systematic conservation planning, there is potential for a forest

transition where sustainable development policies could halt deforestation and promote reforestation. This is the starting point of many interventions. Once we become aware of the changes and the risks they entail, we can commit to change.

However, despite the accumulation of these pleas, we are faced with a paradox—the disparity between historical records of successful forest transitions at the landscape or country scale and the frustrating reality we face today when consciously attempting to reverse the trends of deforestation and degradation at the global scale (Mather, 1992; Rudel et al., 2020). Our best efforts seem to fall short, our strategies and public policies aimed at achieving these goals miss their targets (Fleischman et al., 2020; Garcia et al., 2020a; Coleman et al., 2021; Pearce, 2022). In the global front of deforestation, we seem to be winning battles and losing wars.

Acknowledging this vexing situation, we might have to look beyond the fields we traditionally consider. In a recent article, Kull et al. (2024) highlighted nine reasons why forest transitions and sustainability are not necessarily linked, among which are neglecting dominance structures and power shifts and ignoring local agency and sentiments.

This is the point of the third paper, in Sierra Leone. Paper 3 (Bakarr and Abu-Bakarr): By proposing a landscape framework for forest conservation, this paper illustrates how strategic land use
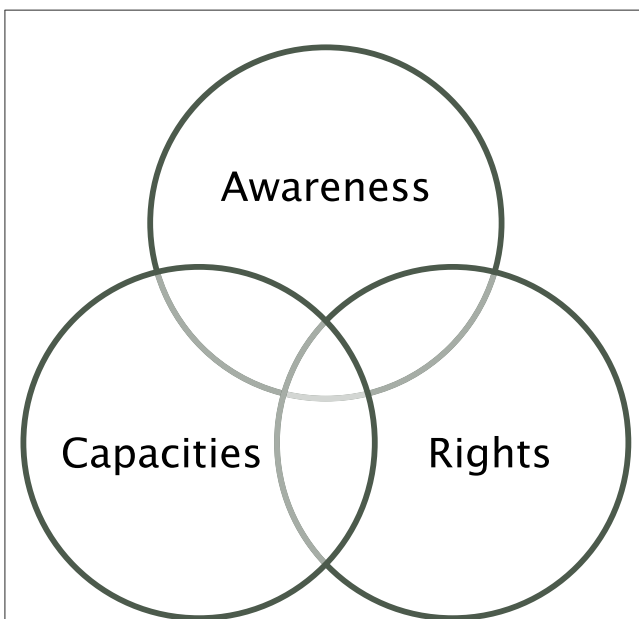

FIGURE 1
A heuristic framework to account for agency in forest transitions. This diagram depicts the interrelationship among three fundamental components: *Capacities* (the inherent abilities or potential actions available to an individual), *Awareness* (the individual's awareness or realization of the world's possibilities), and *Rights* (symbolizing the societal permissions or legal allowances for action). The intersections between these components highlight the complex dynamics of human agency, emphasizing the role of personal awareness, societal structures, and inherent abilities in the process of stepping to action. This framework offers a comprehensive view of the factors influencing an individual's ability to act and make choices within a given social and legal context. It also highlights that only a fraction of any external intervention aiming at empowering people will yield results, as the other dimensions remain limiting factors.

and the integration of community-based approaches can facilitate a forest transition. We need systemic approaches that look at the interplay of ecosystems, people, and the norms and institutions people devise (Garcia et al., 2020a; Bakarr and Abu-Bakarr). We all have our entry points in these dialogues—biodiversity, justice, livelihoods—and they are all valid, but to be effective we need to learn how to consider the totality of the landscape. It seems this complexity defies managers and conservationists—and this is true for forests as it is for any other ecosystem.

The fourth paper (Pereira et al.) on deforestation and soil dynamics in the Cerrado discusses this point, highlighting the environmental impacts of deforestation and the necessity of sustainable land management. By advocating for sustainable practices to mitigate soil degradation, the paper seeks to align with the notion that effective management and policy interventions can lead to a transition from deforestation to reforestation and that we pay the consequences of not looking at all the components of a landscape.

When we approach a landscape through the angle of power imbalances and social justice, it is easy to lose sight of the ecological boundaries that define the system. Err in the other direction, forget rights for example and you run the risks of reinforcing existing power asymmetries and alienating vulnerable communities. In the complex fabric of a landscape whichever aspect we choose to depict, understand, or manage, one thing becomes clear: what we leave out of our analysis is often the very reason why our initiatives fail.

The second paper (Jimenez et al.) of this Research Topic "*Spatial, Temporal and Ecological Patterns of Peri-Urban Forest Transitions: An Example From Subtropical Argentina*" examines how urbanization around San Miguel de Tucumán leads to spontaneous forest recovery in peri-urban areas. It shows an example where economic development and urban-based land use policies contribute to reforestation—when reforestation is not the objective. Why is that biodiversity can recover and thrive in a landscape when our gaze is somewhere else—in abandoned agricultural lands or industrial and military sites—but shrink and shrivel when we try our best at preventing its loss? Compare the story of the paper with a recent review demonstrated that if conservation interventions, to take an example, can improve and achieve their stated objectives, they do so only half of the time, and that sometimes it would have been better for biodiversity not to try to conserve it (Langhammer et al., 2024). If nature finds a way, why do we miss so often? The problem might lie precisely there—in our gaze.

Can we model our outside gaze to align with the factors that drive decisions of the agents that are part of the system? Can we complement and enrich the insider's perspective with the proverbial larger picture? Let's propose a simple framework. The choices individuals in a landscape make can be thought of as an interplay between three dimensions: the *capacities* people have, their *awareness*, and the *rights* they receive or grant themselves (Figure 1).

The concepts are not new. Amartya Sen already introduced the concepts of capacities and their realization (Sen, 2014). The term affordances was proposed by Gibson (2014) to describe the interaction of capacities with the environment. The simple framework we propose here distinctly separates the inherent capacity from the individual's awareness of it. This explicit

distinction helps understand why people may or may not act on their capacities. We emphasize rights as a separate category, underscoring their critical role in enabling individuals to bring their capacities into action. Rights distinguish what one should not do from what one could or should do. Some might decide to respect this boundary, others not. Some might afford not to respect it, others might be trapped inside (Ponta et al., 2021). Finally, different right regimes—customary, moral, constitutional—might overlap making this boundary fuzzy.

This framework provides insights into the dynamics of human agency, especially in terms of how individuals understand and navigate the space offered by their capacities within various social and legal frameworks. It combines philosophical considerations about agency and the possibility of free will focusing on individual capacities and choices with considerations of societal and structural factors emphasized in economic and sociological theories of agency. Additionally, by explicitly addressing the role of knowledge and awareness, we highlight the cognitive and psychological aspects of agency, an area that is often implicit but not always directly addressed.

Understanding people's agency better can lead to more successful landscape trajectories. It seems this is easier said than done, however (Waeber et al., 2023). Once again, we have to acknowledge with frustration that providing stakeholders with capacities, expanding their knowledge, or granting them rights does not guarantee meaningful outcomes (Garcia et al., 2020b). Since one needs all three to engage and all three can be limiting, only a fraction of the resources we invest in people may prove to be truly useful.

Empowering stakeholders effectively is a daunting task, as it necessitates a balanced investment across capacities, knowledge, and rights to help people fully realize their potential. Our capacity to successfully steer landscapes toward a safe operating space for humanity and the other beings we share the planet with—the challenge of the Anthropocene—rests on our capacity to listen and to integrate different perspectives in our decision-making process. Better understanding ourselves, better understanding the others, better understanding the system is a step in that direction.

The examples from the papers illustrate how the interplay of capacities, awareness, and rights can drive or stall forest transitions in different contexts.

Author contributions

CG: Conceptualization, Writing – original draft. PW: Conceptualization, Writing – original draft.

Funding

Conflict of interest

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