

*Editorial*

## Current Challenges and Perspectives for Governing Forest Restoration

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**Abstract:** Negotiation, reconciliation of multiple scales through both ecological and social dimensions and minimization of power imbalances are considered critical challenges to overcome for effective governance of forest restoration. Finding the right mix of “command and control” in forest restoration vs. “environmental governance”, which includes non-state actors, regulatory flexibility, and market based instruments is at the heart of these challenges. This Special Issue attempts at shedding light on these challenges with case studies from South and Central America, Africa, and Asia. Some provide within-country as well as cross-country comparisons. A few others present case studies at the household level. Both policy and legal constraints towards implementing forest restoration are also discussed as a function of top down vs. bottom up approaches. The effectiveness of payments for environmental services is examined as catalyzers of forest restoration initiatives. Finally, two papers deal with the legal and policy constraints in making restoration through natural regeneration a viable and cost-effective tool. In the face of renewed perspectives for expanding forest restoration programs globally, governance issues will likely play a key role in eventually determining success. As many of the papers in this Special Issue suggest, the fate of forest restoration outcomes is, more often than not, associated with overall governance challenges, some of which are often overlooked particularly across multiple scales.

**Keywords:** global policy; payment for environmental services; natural forest regeneration; multiscale governance

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## 1. Introduction

The main forest governance trends that defined the last two decades are thought to be: (i) decentralization of management; (ii) the role of industrial logging in government-granted forest concessions; and (iii) market-oriented certification [1]. Furthermore, it is also agreed that the following key variables influence the outcomes of forest governance particularly across the tropics: (i) user rights and responsibilities; (ii) participation by those who use and depend on forests; (iii) accountability of decision-makers; (iv) monitoring of forest management; (v) enforcement of property rights; and (vi) institutional capacities [1]. Yet for the most part, these conclusions have emerged when the natural resource base is already sufficient for providing forest-based goods and services in the long-term [2], in other words, management of natural forests. Less seems to be known when the objective is restoring forest cover in degraded or otherwise deforested land. While there is no major reason to believe that the abovementioned issues would not also shape forest restoration outcomes (see examples in [3]), the challenges may differ from those applied to natural forests.

First, forest restoration not only deals with access and/or use of a novel resource base but also with long lasting changes in land use allocation and human use. As a consequence, if forest restoration is not planned, implemented, and managed to eventually become a profitable and equitable land use option [4], conflicts may arise [5]. Second, it is only recently that the social sciences have been included in theoretical frameworks and the practice of ecological restoration [6,7] along with the insertion of historical, political, judicial, aesthetic, as well as moral issues [8–10]. That said, only a decade ago Dudley *et al.* [11] urged practitioners to move beyond tree planting, to restore with a landscape mindset while considering both biophysical and socioeconomic issues, and to insert the views of different stakeholders and institutions. Governing “forest landscape restoration” could be seen as a nascent field with methodological, conceptual, and practical challenges ahead.

Yet with the growing recognition that forest restoration offers great opportunities for supporting biodiversity conservation and ecosystem services provisioning at the global and local levels [12], the number of projects have dramatically increased along with their spatial scale [13–16]. Particularly in a landscape context, negotiation, reconciliation of multiple scales through both ecological and social dimensions and minimization of power imbalances are considered critical challenges to overcome [17]. Finding the right mix of “command and control” in forest restoration vs. “environmental governance” [18], which includes non-state actors, regulatory flexibility, and market based instruments, is at the heart of these challenges. Governance systems may therefore need to be adapted to include a wide range of stakeholders, legal instruments, inter-sectorial policies, and multi-level government administrations. Here we apply the definition of governance used by Colfer and Pfund [19]: “The ways and institutions through which individuals and groups express their interests, exercise the rights and obligations, and mediate their differences.”

## 2. The Contents of the Special Issue

The papers composing this Special Issue attempt to shed some light on the above-mentioned issues. In total, the 10 papers cover case studies in seven countries, from South and Central America, Africa, and Asia. They cover both the tropics and subtropics and include global, national and local scales. Some provide within-country as well as cross-country comparisons, while others focus on natural regeneration as a mode of forest restoration. A few others present case studies at the household level. Both policy and legal constraints towards implementing forest restoration are also discussed as a function of “top down” vs. “bottom up” approaches. The effectiveness of payments for environmental services is examined as catalyzers of forest restoration initiatives.

Forest restoration has been a prominent topic in the agenda of many international forums over the last decade from a climate, biodiversity, desertification and sustainable development perspective (reviewed in Lamb [3]). In particular, at the 2010 Conference of the Parties to the Convention on Biological Diversity, two ambitious proposals (Aichi Targets 14 and 15) were adopted with the aim of restoring degraded land at a global scale. The article by Pistorius and Freiberg [20] focuses on the international restoration policy arena and discusses the major challenges facing the mobilization of billions of US dollars that may be needed to reach these targets. It is estimated that 20 million ha of terrestrial degraded land will have to be restored per year until 2020. The authors discuss how a “collaborative governance approach” may be needed for an effective implementation of these targets, since they conclude that the current global institutional landscape is too fragmented. More often than not, international targets, although representing genuine aspirations, do not permeate down to national and local levels. That said, Pistorius and Freiberg make the case for serious consideration of multi-stakeholder partnerships (between the private-and public sectors, and civil society) as one way forward.

The issue of collaborative governance to overcome institutional fragmentation is further discussed at the local level in the paper by Pinto *et al.* [21]. Although in many countries, particularly across the tropics, government-led reforestation and restoration programs are the norm, the authors make the case against top down approaches and the lack of positive incentives in the practice of forest restoration by presenting the governance structure of the Atlantic Forest Restoration Pact (AFRP) in Brazil. Fragmented efforts and disregard of critical bottlenecks for upscaling plot-based restoration prompted the development of a multistakeholder and interdisciplinary platform where different interests, perspectives, skills and approaches converge towards a common goal along with the ambitious target to restore 15 m ha of the Atlantic Forest biome. One important lesson learned from the AFRP mechanism is that solely relying on legal compliance for implementing restoration is neither sufficient nor desirable. Note that in many cases, restoration governance is dictated by top-down legal instruments, such as biodiversity offsets [22]. In fact, nearly 60% of the studies reviewed by Ruiz-Jaen and Aide [23] were carried out to comply with environmental laws.

The interactions (or lack thereof) among different actors other than government; of voluntary and negotiated agreements; of flexible approaches to negotiated implementation; and of market-based instruments are documented across the papers described ahead. In Ethiopia, Lemenih and Kassa [24] argue that although ambitious reforestation and restoration targets were set by the central government (2 million ha for afforestation and 1 million ha for reforestation), it has been mainly non-governmental

organizations (NGOs) that have played a key role in their implementation while advocating for policy reforms. Yet the authors point out that lack of knowledge sharing among NGOs has resulted at times in contradictory messages to both local communities and policy makers. The authors further conclude that at present, the various reforestation and restoration practices in Ethiopia lack coordination, both technically and managerially and also lack the application of indicators of performance for measuring success. Also at the country level, but through a comparative view, the paper by van Oosten *et al.* [25] from Indonesia analyzes how people's views and participation are inserted in those landscapes to be restored in three contrasting situations: (i) the extension of a national park; (ii) compliance with environmental law; and (iii) collective action. Three case studies represent different interpretations on the nature of forest restoration, different governance mechanisms and different extent of stakeholder involvement. In each case, flexible governance arrangements were lacking from the outset and therefore institutional space for negotiated decision-making had to be created. In Brazil, by using a case study from São Paulo State, Ball *et al.* [26] describe lessons learned on how a landscape-scale forest restoration project was conceived by an international NGO in the Atlantic Forest biome. The project targeted small-scale landholders to restore their degraded lands by offering restoration models that would provide economic benefits. In spite of initial optimism, problems in the implementation phase arose. These related to fund allocation, legal regulations hampering native species harvesting, and on the adequate integration of the needs and perspectives of participants. The authors recommend baseline social assessments to improve project design, simplification of legal frameworks to exploit native species, and better communication and articulation among stakeholders.

In the only paper of the Special Issue having a cross-country approach, Mansourian *et al.* [27] explore how different governance challenges are displayed under different forest tenure arrangements in private forests in Paraguay and co-managed forests in Madagascar. Two key factors raised as necessary for effective and equitable forest landscape restoration are: (i) improving the forest governance context so that processes are more effective and key stakeholder groups can increase their participation in restoration activities; and (ii) promoting positive incentives for implementing restoration including compensation for the provision of ecosystem services. The authors also argue that in these two countries, fragmented multilevel governance and poor policy-making further hinder forest landscape restoration. In Paraguay, what is seen as complex forest legislation does not seem to parallel the level of support needed by institutions that are to implement and enforce such legislation. While in Madagascar, the main reason for local-level engagement in co-management arrangements is likewise a response to what are seen as defective policies regarding management and ownership rights.

Previous analyses have underscored the potential for forest restoration to enhance the delivery of environmental services for global and local benefits [28]. In the context of positive incentives through conditional payments, two papers shed relevant information on this topic. Pirard *et al.* [29] studied two watershed restoration projects in Indonesia, both of which are assumed to increase dry season watershed flows (through tree planting), and the concurrent ability of payment for environmental services (PES) schemes to improve the effectiveness of these initiatives (compared to government-led watershed programs). The authors conclude that despite their innovations over command and control approaches, the applied PES schemes have had limited effectiveness in promoting forest restoration. However the ability of local stakeholders in adapting to changes in the way these programs have evolved over time (after the intervention of several international actors) has generated a sense of collective ownership

towards the goal of securing water provision. The paper by Bennett *et al.* [30] refer to what is known as the world's largest afforestation-based payments for ecosystem services program (27 million ha), China's Conversion of Cropland to Forest Program (CCFP). The authors examined the factors associated with the survival rate of planted seedlings, which is used by CCFP both as a measure of the impact of program incentives and to deliver subsidies to participating rural households. A key result is that households with higher levels of human capital in forestry activities appear to be better at keeping trees alive. Another key result is that the degree to which local governments engage with participants during program implementation has a positive effect on program outcomes.

When land use after deforestation and degradation has been neither heavy nor prolonged, forest ecosystems are known to recover rapidly without human intervention through secondary succession [31]. Thus relying on natural regeneration is a viable restoration approach when carefully assessed against those variables known to define both the speed and trajectory of unassisted forest recovery [32]. Yet for decades, secondary forests have remained "under the radar" in both national and international land use planning strategies [33] in spite of international efforts to recognize these forests as a legitimate land use type [34]. Interestingly, the legal frameworks governing second-growth forests in many tropical countries are frequently marked by ambiguity (e.g., Sears *et al.* [35]) while the opposite applies for human-assisted forest restoration where public policy and detailed legislation is very clear [10]. Two papers in this Special issue deal with the legal and policy constraints in making natural regeneration a cost-effective tool while satisfying both the needs of local people and conservation objectives.

The paper by Vieira *et al.* [36] analyzes the key legal impediments facing the development of a system of good governance for second-growth forests in the state of Pará, in the Brazilian Eastern Amazon. In contrast to the rest of Brazil where in most states there is no legal definition for when a regenerating area becomes classified as "forest" rather than "fallow" (and thus qualifies for legal protection), Pará is the only state of the Brazilian Amazon that has adopted an explicit definition of second-growth forests based on biophysical parameters (once the definition applies, these cannot be cleared in order to comply with conservation objectives). However, the authors discuss how effective governance of this widespread tropical resource is challenged by lack of clarity in terms and definitions, inconsistencies in legal frameworks from the federal to the local level, and an overall perception by society and policy makers that secondary forest ecosystems have little value. The authors further conclude that for secondary forests to restore ecological and social values through natural regeneration, management decisions should not be made based on technical indicators of forest condition alone but should incorporate an understanding of the drivers of success, encompassing the suite of inter-related biophysical, socio-economic and institutional factors. To this end, dialogue between the environmental and agricultural decision makers is warranted.

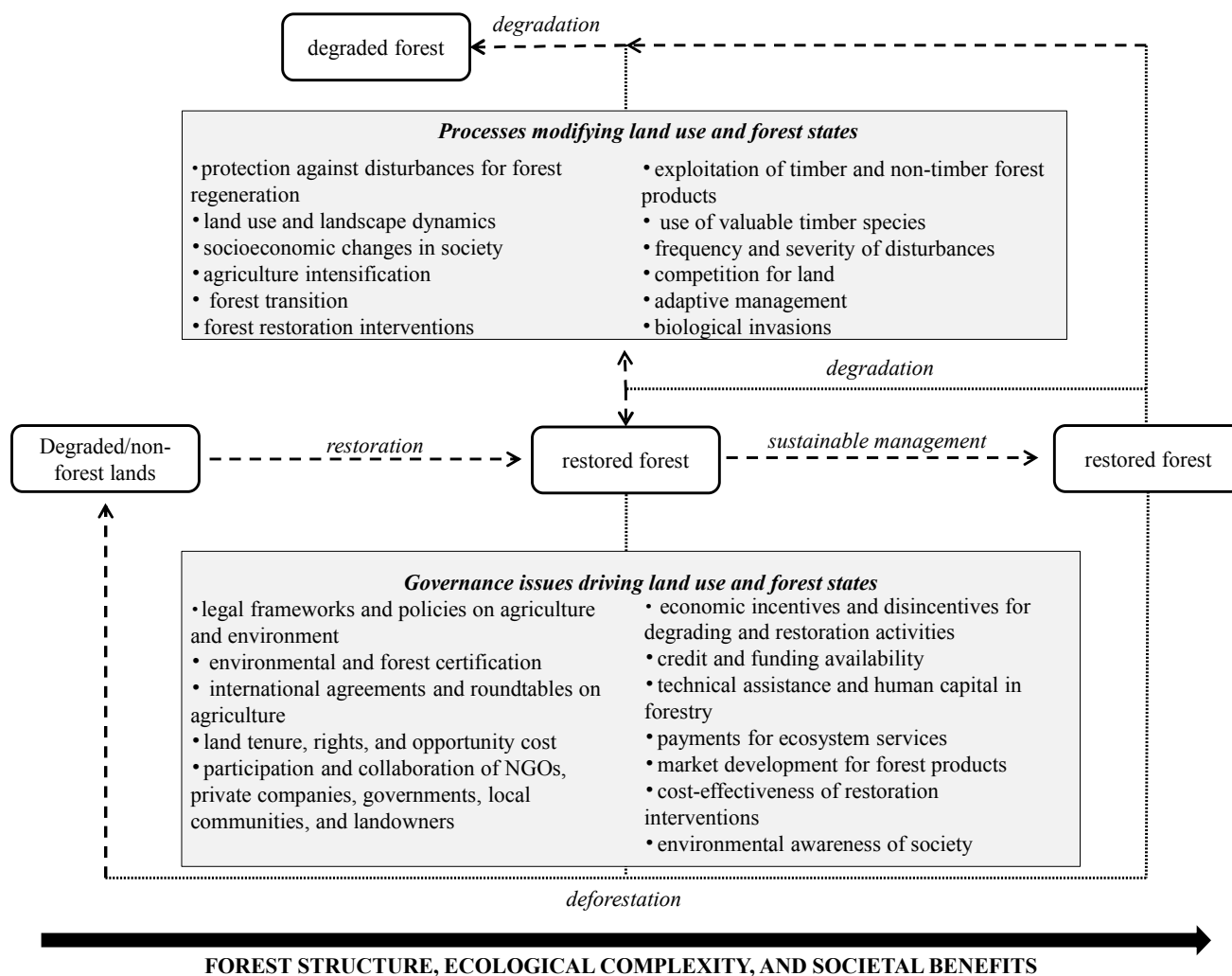
A related situation occurs in Mexico where secondary forests are defined strictly on biophysical grounds. The paper by Román-Dañobeytia *et al.* [37] evaluated the relevance of the rigidly applied reference values in the current forestry law that defines what a secondary forest is. They suggest that these standard values limit potential management actions in the Yucatán Peninsula. In contrast to the case study from Brazil mentioned above, once the biophysical reference values are reached, the forest is subject to overregulation. In other words, secondary forests are prevented by law from traditional,

extractive uses, as formal management plans are required. As in the above case, cross-sectorial dialogue is needed.

### 3. Conclusions

Not long ago, and right after the first formal definitions of “ecological restoration” provided by Bradshaw and Chadwick [38], the discipline developed somewhat in isolation. As seen in this Special Issue, restoring degraded or non-forested lands is an inherently multidisciplinary, multiscalar and multisectorial activity in need of good governance so that the rights and obligations as well as mediation of differences among stakeholders contribute both to achieving predetermined restoration objectives and the maintenance of the resource base (Figure 1). In the face of renewed perspectives for expanding forest restoration programs globally [39], governance issues will likely play a key role in eventually determining success. As many of the papers in this Special Issue suggest, the fate of forest restoration is frequently associated with systemic governance challenges, which are all too often overlooked. It is therefore hoped that this Special Issue provides at least some useful background for designing and implementing new and more effective forest restoration programs globally.

**Figure 1.** Key governance issues driving ecological and socioeconomic processes associated to land and forest states modification and their outcomes.



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## Author Contributions

Both authors wrote together the article presented here.

## Conflicts of Interest

The authors declare no conflict of interest.

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