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Governance and forest landscape restoration: A framework to support decision-making

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ABSTRACT

Governance challenges are frequently underestimated in forest landscape restoration. Forest restoration practitioners are generally foresters or ecologists and their focus tends to be limited to the specific restoration interventions themselves, such as removing exotic species, protecting sites for natural regeneration and re-planting indigenous trees. Indeed there are many technical challenges, unknowns in technical aspects of forest landscape restoration and knowledge gaps. However, and even more so when dealing with large scales, additional challenges that fall under the governance umbrella such as tenure, policy measures and institutions have a significant impact on restoration, influencing it either positively or negatively. Conversely, the landscape-scale restoration work itself can influence and shape governance arrangements. This paper attempts to explore this wider relationship between large scale forest restoration – and specifically forest landscape restoration (FLR) – and governance. It is intended to assist and provide guidance to forest landscape restoration practitioners, researchers and policymakers on the consideration and importance of governance, and alternative ways in which the two-way relationship (between governance and FLR) plays out. A framework is proposed to support practitioners, researchers and decision-makers to address governance in forest landscape restoration.

1. Introduction

Forest landscape restoration (FLR) has been receiving a lot of attention in the last decade (Mansourian, Vallauri, & Dudley, 2005; Rietbergen-McCracken et al., 2007; Stanturf et al., 2012; Lamb 2014). It was defined in 2000 as a "*planned process that aims to regain ecological integrity and enhance human wellbeing in deforested or degraded landscapes*" (WWF & IUCN, 2000). The intention is not to turn an entire landscape into forests, but rather to ensure that forest quality is improved in the landscape for the benefit of both people and biodiversity. Forest landscape restoration faces a number of "technical" challenges that relate for example, to identifying seed sources, the number and diversity of species used, removal of invasive and/or exotic plants, restoration methods, adapting planting to seasons, management of nurseries etc. (Clewell, Rieger, & Munro, 2000; Lamb, Erskine, & Parrotta, 2005; Chazdon 2013; Stanturf, Palik, & Dumroese, 2014). In addition, FLR faces several governance challenges. For example, who decides what and where to restore? How are all stakeholders engaged? Who benefits? Who loses? How are benefits transferred? What institutions support (or hinder) FLR? (Brunckhorst, 2011; Mansourian 2016). Supportive governance may be even more critical than technical issues for successful restoration (Hobbs, Hallett, Ehrlich, & Mooney, 2011; Guariguata & Brancalion 2014; Sayles & Baggio 2017). Yet, a review of the literature indicates that there is limited to no guidance for FLR practitioners on how to integrate governance in their work (Mansourian 2016). This paper is intended to help fill this gap. The intention is to assist FLR practitioners (project designers and implementers such as non-governmental organisations, scientists, project managers etc.), researchers and policymakers to better understand the role of governance in FLR implementation (recognising that there are also ecological challenges to FLR, but these are beyond the scope of this paper). In particular, it proposes a framework and three overarching recommendations. While the focus is on FLR, in reality these challenges are relevant to any large scale forest restoration effort.

Whereas an earlier paper (Mansourian 2016) focused on the intersection between governance and the implementation of the FLR process, this paper attempts to offer practitioners, researchers and policymakers (working at all levels) a framework to help them consider governance in FLR implementation. It identifies gover-

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nance both as a problem and a solution for FLR, and also seeks to portray the different ways in which governance relates to FLR. The aim is not to define a prescriptive governance model for FLR – recognising the diversity of settings in which FLR takes place – but rather to understand, influence and shape, wherever possible, governance for FLR.

2. Methods

Research was conducted between February and April 2016 by the author. There were three components to the methodology: 1. a review of tools for FLR (and large scale forest restoration) focusing on key bodies involved in FLR (or large scale forest restoration), such as the Society for Ecological Restoration (SER), the Global Partnership on Forest Landscape Restoration (GPFLR), the International Union for Conservation of Nature (IUCN), the World Resources Institute (WRI) and WWF. The content of the tools was analysed for any guidance related to governance (searching for relevant terms such as "governance", "policy", "stakeholders", "institutions", "tenure", "ownership" and "social"). The aim was to assess how much, if any, guidance targeted governance or governance-related aspects. Where such guidance existed, it was extracted (see Appendix A).

2. a review of literature on governance and FLR centred on Scopus, the ISI Web of Knowledge and Google Scholar. Key search terms were "governance and FLR" and "governance and forest restoration". Because of the limited literature (a maximum of 19 items were retrieved with these search terms on Scopus), I broadened the search to "environmental governance" in order to identify key findings on environmental governance that could be applicable to FLR. A snowball method was used, whereby the literature cited in different papers served to further direct my research.

Using an interpretive review (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005) major governance themes that related to FLR were extracted and used to develop a framework to address governance challenges and seek governance solutions in support of FLR.

3. use of illustrative examples and case studies from known cases and from project databases such as those of WWF, the Society for Ecological Restoration's Global Restoration Network database and that of the GPFLR. The main criteria for the choice of case studies were that they were known to the author, there was sufficient information on them and they were relevant.

3. Preliminary contextual considerations

Based on the review of tools, literature and projects, in a first instance a presentation of the relationship between governance and FLR is provided to help frame this article.

3.1. Defining governance

It is useful to tease apart how the term "governance" is used in the environmental literature to better understand the different definitions and interpretations. Multiple definitions of governance can be found in the forest and environment literature but what they generally have in common is that they refer to: 1. people (stakeholders, actors, groups, individuals etc.), 2. decision-making actions (e.g. shaping, deciding, influencing etc.) and 3. tools that enable people to make those decisions (e.g. rules, regulations, institutions, policies etc.). In addition, in the context of forests and natural resources, the term "governance" is frequently associated with other terms, such as "structures", "issues", "bodies" etc. Prevailing terminology suggests a distinction between: 1. overarching decision-making bodies and processes, e.g. "governance systems" (Jordan, 2008; Reed, Van Vianen, Deakin, Barlow, & Sunderland, 2016), "governance regimes", "modes of governance" or "governance arrangements" (Batterbury & Fernando 2006; Howlett, Rayner, & Tollefson, 2009); 2. elements of an overarching system of governance, e.g., "governance structures" (Reed et al. 2016; Pinto et al., 2014), "governance aspects", "governance issues", "governance mechanisms" (Batterbury and Fernando, 2006) or "governance instruments" (Pinto et al., 2014) and 3. phases of a larger process, e.g., "phases of governance" (Batterbury & Fernando 2006), "governance problems" and "governance solutions" (Paavola 2007). A distinction needs to be made between governance and governing (Kooiman 1993; Jordan 2008). Kooiman (1993) refers to "governing" as being activities intended to "guide or steer" and governance being "the patterns that emerge from the governing activities of social, political and administrative actors". Thus, governing can be seen as a sub-set of the broader process of governance. Governance has also been associated with management. Lammerant et al. (2013) for example, refer to the "governance model" in their ecological restoration guidance referring to management structure. However, whereas management relates to operational decision-making to achieve specific outcomes, governance refers to the broader processes and institutions through which decisions are made by societies writ large. Governance is also more than just government, particularly since in most countries in recent decades the range of actors empowered to engage in environmental decision-making has grown (e.g. Lockwood, Davidson, Curtis, Stratford, & Griffith, 2010; Ekroos, Leventon, Fischer, Newig, & Smith, 2016). Indeed the term has acquired greater recognition in the literature to refer to decision-making processes and structures that go well beyond governments (e.g. Lemos & Agrawal 2006; Paavola 2007; Görg, 2007).

For our purposes, and with forest landscape restoration in mind, governance is understood in the broadest possible sense as the decision-making rules, structures and processes involved in restoring forested landscape. I propose here a definition based on those of Lemos and Agrawal (2006), Swiderska et al. (2009) and Colfer and Pfund (2011): governance in the framework of FLR refers to the wider set of institutions and stakeholders at all levels and the ways in which they connect and interrelate over time to influence the implementation of FLR and the process of restoring a forested landscape.

3.2. Why governance and forest landscape restoration?

Governance can be both a problem and a solution for FLR implementation. In order to restore a forested landscape, it is necessary to understand how governance influences FLR, which aspects of governance can hinder FLR implementation, progress or sustainability, which ones can support FLR implementation and how to surmount governance obstacles. Although a supportive governance framework can help accelerate FLR implementation (Hobbs et al., 2011), clearly a whole raft of ecological and technical considerations are also required, such as: what state is the forest ecosystem currently in? what trajectory brought it to this state? which species to use? which methods to apply? should active or passive restoration be undertaken? While precedence is frequently given to these ecological considerations, in practice, growing research indicates that the interaction between ecological and governance dimensions is critical to the success of FLR (or forest restoration) implementation (e.g. Hobbs et al., 2011; Guariguata & Brancalion 2014).

Governance is important for FLR and large scale restoration for numerous reasons (Hobbs et al., 2011; Nagendra & Ostrom, 2012; Guariguata & Brancalion 2014). Firstly, FLR works across landscapes, signifying that there are likely to be more stakeholders (and diverse owners) than on a smaller site or plot. As a result, without clear rules on the use of forests, on land and forest rights, and on

decision-making processes, efforts to restore part or all of the landscape are likely to be challenging (Colfer & Pfund 2011; Görg 2007; van Oosten 2013; Sayer et al., 2013). Because FLR seeks to balance ecological objectives with human ones, decision-making will necessarily involve diverse stakeholders (e.g. environmental groups, forest owners, local authorities, rural communities etc.) with very different interests. Processes to allow these groups to air their expectations, needs and priorities, and that foster constructive discussions towards negotiated solutions, will be essential (Sayer, Bull, & Elliott, 2008). Secondly, landscapes do not correspond to administrative units, but instead are shaped and influenced by national and local governance processes, as well as global ones (Colfer & Pfund, 2011; Ekroos et al., 2016). As such, rules governing landscapes are less formal than those governing established administrative unit. Furthermore, influences on the landscape from administrative units above and below or across sectors, impact on the evolution of the landscape. Thirdly, the restoration process is dynamic and long-term (e.g. see Crouzeilles et al., 2016; Richardson & Lefroy 2016) and evolves over time, thus changing the value of the landscape (van Oosten 2013; Mansourian 2016). Some of these changes may or may not be acceptable to all stakeholders. There will most likely be winners and losers, and understanding and recognising these trade-offs, as well as compensating for losses, requires an effective governance framework.

FLR can also influence governance. For example, FLR experiences from around the globe will certainly shape the way the United Nations Convention on Biological Diversity (CBD) interprets its Aichi target 15 on ecosystem restoration. Equally, at a national level, lessons emerging from FLR projects may influence policies and institutions, notably those related to land use and forestry.

Despite the above, a quick review of some proposed tools to guide FLR (or large scale forest restoration) implementation, highlights that there is limited guidance on governance to date. Eight tools reviewed (see Appendix A) revealed that except for Clewell et al. (2005), governance-related guidance on FLR and/or large scale restoration remains limited to "engaging stakeholders" with limited to no guidance on how to recognise stakeholders (who has a stake?) or truly engaging them (Reed et al., 2009).

4. Results: the spheres of influence

Based on an interpretive analysis of the review of literature and tools three important aspects of how governance can be a problem, influencing and impacting on the FLR process are presented below. Examples from different case studies are included for illustrative purposes.

4.1. *Influences from beyond the landscape: international to local*

Forest landscape restoration takes place within a landscape. Albeit a fuzzy scale with unclear boundaries, delimiting the landscape is in itself a power-laden decision (Görg 2007). Different stakeholders may further perceive different boundaries to that landscape which can exacerbate misunderstandings when it comes to implementing any restoration initiative. The landscape in which FLR takes place is embedded in a series of multiple scales (see Fig. 1) and influences on the landscape may emerge from international to local scales (Görg 2007; Kozar et al., 2014; Ekroos et al., 2016). Furthermore these will inter-relate and evolve over time (Cash et al., 2006). Decisions, policies and institutions from other sectors – including agriculture, tourism, industry, infrastructure – and at several scales, and the ways that these diverse aspects of governance combine and inter-relate and their effectiveness in doing so, will all impact on the landscape being restored (Lockwood et al., 2010; Sayer et al., 2013; Guariguata & Brancalion 2014).

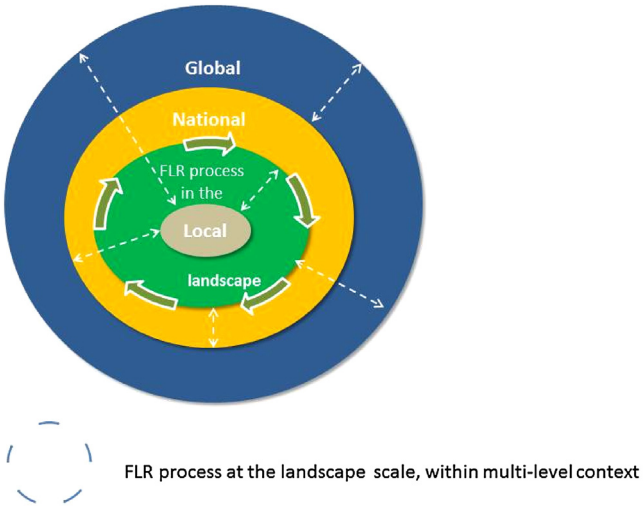

Fig. 1. Interactions at all levels for FLR implementation [the large circular arrows represent the FLR process at the landscape scale while the dotted arrows represent interactions and influences across scales].

For example at an international level, market-related mechanisms, notably those that promote tree planting for carbon sequestration under the global climate regime (such as REDD+) can significantly influence the FLR process (for better or worse depending on the approach taken) (Parrotta, Wildburger, & Mansourian, 2012). Global environmental conventions that were set up in recognition of the complexity and transboundary nature of environmental problems also impact on the FLR process. In particular, recent interest in large scale governance by the three Rio Conventions trickles down to implementation via national governments and influences landscapes, local level stakeholders and institutions. For example, in Indonesia, international funding to protect and restore the forest (and its carbon) can clash with national level policies to promote oil palm expansion as well as trigger local level conflicts over land resources that are claimed by communities but allocated to oil palm plantation companies (Brockhaus, Obidzinski, Dermawan, Laumonier, & Luttrell, 2012; Hein, Adiwibowo, Dittrich, Soetarto, & Faust, 2015).

The surrounding national governance framework sets policies, regulations, institutions and ensures enforcement (e.g. Kozar et al., 2014). Many of these might be outside the forest or land use sector, but still have an impact on FLR implementation. For example, typically, the promotion of different commodities via policies and incentives will affect land use and therefore, FLR. Also, poorly integrated restoration-related policies may have negative consequences. Brazil's political emphasis on restoring the Atlantic forest (see Section 5.2.) may be impacting on governance (and ultimately on the stated desire to increase forest cover) by displacing agricultural activity to new zones (Latawiec, Strassburg, Brancalion, Rodrigues, & Gardner, 2015).

At the local level, traditional and indigenous governance aspects, such as customary tenure and traditional land use decision-making arrangements, will also influence the way in which FLR will be achieved or not. For example, in Morocco the age-old (Berber) tradition of forest *aqdals* which set aside land areas to enable them to regenerate, has been lost in many parts of the Atlas Mountains, to the detriment of the landscape (Auclair, Bourbouze, Dominguez, & Genin, 2006).

The interplay with governance at all levels is important to both governance and restoration outcomes. For example, local and customary land tenure might clash with formal national level tenure arrangements as is the case in Western Canada, where the Haida Nation and the government of Canada have disputed ownership of

the Queen Charlotte Islands for decades.Despite this fundamental disagreement, the two have cooperated on a collaborative management board to ensure the sustainable management and restoration of the archipelago (Gardner 2001; Sargeant 2015).

Inconsistencies across scales, or poor attention to key influences from different scales may negatively impact on FLR in the landscape.

4.2. Governance process versus governance outcome

Governance can be understood as both a process and an outcome (Adger et al., 2003; Jordan 2008). As a process, governance is the specific combination of factors and the ways in which they combine and function to achieve an outcome. For example, in New Caledonia the dry forest FLR programme was negotiated among 10 partners (both national and international actors, from different sectors). The programme was also incorporated in the 5-year budget allocation that the central French government grants the overseas territory of New Caledonia (Mansourian & Vallauri 2014). In this example the governance process to establish, implement and monitor the programme was through a formal partnership of actors from diverse sectors and scales (NGOs, government both local and national).

Governance as a process requires time and different elements (e.g. stakeholders, institutions) coming together. The governance process necessarily evolves, adapts and changes based on new conditions while at the same time directly influencing those conditions. Both the governance and the FLR processes inter-relate and evolve over time, influencing each other. For example, in the UK devolution of power to the Scottish parliament in 1999 also changed the manner in which Scotland managed its forests. A profound shift can be witnessed in the country's forest policy with a significantly greater role for different Scottish actors in environmental policy associated with an increased nationalistic desire to restore native Scottish woodlands. Such native forest restoration is now a core part of the nation's forest strategy (Colfer & Capistrano 2005).

Throughout the lifetime of an FLR initiative, there will be the need to contend with, engage or design governance processes (such as new collaborations) across scales and among different stakeholder groups to reach decisions on the landscape to restore, methods used, compensation required, distribution of benefits etc. For example, in Madagascar as part of the process to develop an FLR initiative, a national working group on FLR was set up in 2002 and it has helped to align government policies and garner support for FLR (Mansourian, Razafimahatratra, Ranjatson, & Rambeloarisao, 2016).

As an outcome, governance emphasises normative aspects such as accountability or transparency (although these are also important as process criteria, see for e.g. Bäckstrand 2006). In this respect, it is more often associated with a qualifier, such as "good governance". The World Bank's governance indicators for example, have been criticised as being outcome focused, with indicators including rule of law and control of corruption (Kaufmann, Kraay, & Mastruzzi, 2009). Governance products are also frequently emphasised such as stakeholder platforms, institutions, or management arrangements. Reed et al. (2016) refer to the establishment of a "good governance structure" as a necessary pre-requisite for an effective landscape approach.

Perceiving and understanding governance both as a process and an outcome helps to tease out the specific spheres of influence on an FLR project as well as leverage points to facilitate implementation.

4.3. Formal and informal governance

Governance modes may be formal or informal depending on the way in which governance actors are organised (Howlett et al., 2009). Formal governance is composed of embedded, coded and widely respected institutions, such as government ministries, international conventions or democratic processes of stakeholder consultation. In some cases, governance of the landscape may benefit from formal institutions, such as for example the International Commission for the Protection of the Danube River for management and restoration of this transboundary watershed. Such formal institutions are frequently set up when the landscape in question is transboundary (and particularly as is the case with watersheds such as the Danube or the Mekong rivers). However, there are also informal governance processes, which are characteristically not codified by law (Pacheco, Barry, Cronkleton, & Larson, 2008) such as customary practices that regulate the use of trees and the gathering of tree products at specific times of the year. Increasingly, networks of actors are coming together in what are informal governance arrangements that may have significant impacts. For example, the Global Partnership on FLR (GPFLR) can be viewed as one such informal partnership that has wielded extensive power in bringing FLR to the fore and in increasing its adoption (Wentink 2015). It was set up in 2002 by WWF, IUCN and the Scottish Forestry Commission with a view to mobilise action on FLR. Today, nearly 15 years later, it is a large international partnership including numerous governments that all share a desire to engage in FLR by making public commitments to restore large areas of forest landscapes. Over the years, meetings and commitments of the GPFLR have received much publicity and its partners are increasingly active in global gatherings of several environmental conventions such as the CBD and the UN Framework Convention on Climate Change (UNFCCC). In this case, over time the partnership transitioned from an informal association to a more formal structure creating a global political context conducive to forest landscape restoration. In addition to the political context, historical and cultural contexts will also play a role in determining FLR outcomes, and these may have both formal and informal dimensions. For example, in many tropical countries a significant challenge for FLR relates to the conflict between traditional ownership and use of forests and forest resources, and legal ownership and rules. Such unresolved tensions between the formal and informal present fundamental obstacles to restoration of forests.

5. Discussion – an emerging framework: Re-scaling, mapping and contextualising

Findings from this research indicate the importance of three elements for governance to be a solution for FLR implementation: 1. scale, 2. stakeholders and 3. context. Scale influences both the implementation of FLR and the intersection between FLR and governance. An understanding of the interactions at different scales and an ability to draw from different scales will be important for FLR implementation. Stakeholders, at all scales, be they organised in formal or informal ways, are at the heart of FLR; they engage in both the governance and the FLR processes. An understanding of stakeholders and their motivations and an ability to engage with them effectively is therefore critical in FLR. Context encompasses the institutions, both formal and informal, at all scales that can be used to implement FLR; context shapes both the governance and the FLR processes. Furthermore, context also shapes stakeholders' approaches to FLR. With this in mind, a proposed framework formulated as three recommendations is presented below around: 1. re-scaling, 2. mapping stakeholders and 3. contextualising.

5.1. Recommendation 1: re-scaling landscape level governance

Despite growing scholarly interest in landscapes, the unit remains an arbitrary delimitation which raises numerous governance challenges. Nevertheless, the landscape remains the most attractive scale for balancing trade-offs between different stake-

holders, different scales, and different objectives (Görg 2007) especially when it comes to restoration. Specifically for FLR, the landscape is the unit at which agreement among stakeholders on the desired future (restored) state of the landscape occurs. It is here that negotiations take place, making use of rules, regulations, incentives and other tools from the landscape and other levels. Legitimacy of the landscape boundaries defined by restoration proponents may however be questioned by some stakeholders. To date, a large majority of so-called FLR projects are not truly landscape-scale projects, and landscape governance considerations are generally lacking (van Oosten 2013).

Landscapes do not correspond in most cases to any political jurisdiction, and therefore, may require new forms or modes of governance (Cohen & McCarthy 2015; Newig, Schulz, & Jager, 2016). Re-scaling to the landscape in the case of FLR has yet to be matched by re-scaling in formal governance of restoration. Yet, re-scaling does not necessarily signify remaining static at the landscape scale but rather allows for shifts across scales depending on power changes (Swyngedouw 2000) recognising that vertical and horizontal interactions may have varying degrees of impacts and influence on the landscape.

Furthermore, the restoration process requires considerations of different temporal and spatial scales as well as institutional ones (Baker & Eckerberg, 2013; Kozar et al., 2014). Ultimately the evolution of the landscape over time highlights the dynamic nature of ecosystems which is further modified by an active process such as restoration. The challenge for FLR practitioners is to focus on the landscape without losing sight of other scales and integrating those into landscape level decision-making related to forest restoration. This presupposes a flexible approach that permits scanning for solutions at other scales.

Structures that function at the landscape scale may support governance of FLR, to better engage all landscape stakeholders and to hold them accountable for progress or lack of, on FLR objectives (van Oosten 2013; Chhotray & Stoker 2009; Görg, 2007). On the other hand, by being closely associated with and dependent on an FLR project (and its funding) such structures could be short-lived while the FLR process is a long-term one. Establishing landscape governance structures may also mask the numerous and complex interlinkages (Görg, 2007) and additional governance factors that are critical to effective FLR implementation (Mansourian 2016).

In contrast, polycentric governance (Nagendra & Ostrom 2012) holds more appeal due to its inherent flexibility as it recognises the interlinkages among different independent elements at different scales framed by a set of rules. Embedding FLR governance in existing governance also helps to secure its sustainability. Polycentric governance responds to the dynamic nature of social and ecological systems, and in the case of FLR, to the evolving dynamics in both systems due to forest restoration in the landscape. For example, in the Fandriana-Marolambo landscape in Madagascar, a re-assessment of landscape governance led to collaboration among four bodies: Madagascar National Parks (MNP), the Committee and Support for the Protected Area (COSAP), the local park committee (CLP), and community forest management (CFM) agreements. The first three were important for the management of the protected area situated inside the landscape, as well as for bringing in community interests in management of the protected area, while the CFM promoted restoration outside of the protected area. All of the entities were aligned with the landscape level objectives and vision to improve human wellbeing and ecological integrity in the landscape (Mansourian et al., 2016).

The landscape scale in FLR provides complexity because it does not correspond to any administrative unit. At the same time, it provides opportunities by bridging scales, stakeholders and remaining "beyond" institutionalisation. In this respect, while landscape governance structures may support FLR, in many cases, maintaining a collaborative flexibility across scales – both vertical and horizontal – may be one of FLR's strengths.

5.2. Recommendation 2: putting stakeholders at the heart of the FLR process and mapping connections and relationships

5.2.1. Identifying and engaging stakeholders

Stakeholders are a fundamental component of the governance equation (WRI, 2009; Mansourian, Aquino, Erdmann, & Pereira, 2014). More generally, the lack of true stakeholder engagement has been recognised as a challenge for implementation of the landscape approach (Reed et al., 2016). Placing stakeholders at the heart of FLR serves to better understand and negotiate their different perspectives, needs and desires (Nagendra & Ostrom 2012; Sayer et al., 2013). Some stakeholders may be operating under informal governance arrangements (e.g. traditional rules) while others may be operating under formal institutions.

Despite FLR taking place within a landscape, stakeholders may be present at all levels (Cash et al., 2006). As such, in an FLR process a challenge is to consider and understand all those affected (both positively and negatively) by the process (Nagendra & Ostrom 2012), how they are affected, and negotiate options, including compensation if necessary. Different stakeholders with a stake in the landscape have diverse motivations and inter-relate in different ways; their involvement and power may evolve over time and new stakeholders are likely to appear over the course of an FLR process. An interesting case study (Casazza et al., 2016) demonstrates (unwittingly) the issue of poor stakeholder identification. In this case, stakeholders representing restorationists identified the need to remove an invasive species – cordgrass – (*S. alterniflora* × *S. foliosa*) to restore tidal mudflats and channels. However, in so doing, populations of the state- and federally-listed bird species, California rail, decreased substantially since it was thriving in the cordgrass. One can imagine in this example that had the stakeholders involved in species conservation been part of the restoration process, this may not have happened.

Stakeholders can be described in a variety of ways, notably as public, private or civil society, or according to their geographical scale (local to global) (Reed et al., 2009). Bryson (2004) for example, provides a detailed overview of 15 techniques to analyse stakeholders. Often, stakeholders have been described or analysed in simplistic terms, leading to failed or superficial engagements of communities and resulting cynicism on the real intent and value of so-called participatory processes (e.g. see Cooke & Kothari 2001; Hickey & Mohan 2005). It is clear that even within stakeholder groups (e.g. landholders) there are important differences that require consideration (e.g. Cleaver, Cooke, & Kothari, 2001; Gibson, Williams, & Ostrom, 2005; Mansourian & Vallauri 2014). For example, in Paraguay, individual discussions were held with forest- and land-owners in the Oriental region of the country in order to reach negotiated options to restore part of their land (Aquino pers. comm.).

In the context of FLR, stakeholders can be described according to their role with respect to the FLR process (see Table 1 below). In a theoretical FLR project, biologists or ecologists might be the ones setting up the project with their own agenda to focus on restoring specific ecological processes; the national government might welcome the investment and opportunity to showcase its contribution to global conventions such as the CBD, while the local community might be convinced (possibly through payments for environmental services) that it is worthwhile to restore the landscape.

If the stakeholder analysis is poor and relationships fragile, tenuous engagements towards FLR might fall apart once project funding runs out (typically after 3–5 years based on donor cycles). In contrast, an FLR process that responds to a real and perceived need by a powerful landscape stakeholder group might carry more weight

Table 1
Roles of stakeholders in FLR (author's elaboration).

Role	Stakeholder group	Examples
Provides money/invests	company, NGO, government, landholder	Mining company supporting FLR as part of its corporate social responsibility (see for e.g. Whitbread-Abrutat, Kendle, & Coppin, 2013)
Sets policy framework for FLR	national government, inter-governmental organisation	National government designing an FLR strategy (e.g. the US Congressional Act on Forest Landscape Restoration passed in 2009 – Schultz, Jedd, & Beam, 2012).
Designs/plans project/intervention	NGO, community, company, landowner, academia, national forest service	Environmental NGO designing an FLR project to safeguard an endangered species (e.g. the Royal Society for the Protection of Birds co-purchasing Cousin Island in the Seychelles to restore habitat for the endemic Seychelles warbler – Komdeur & Pels, 2005).
Implements project/intervention(s)	NGO, community, company, landowner, national forest service	Community engaged to remove invasive species as part of an FLR project (e.g. WWF engaging the public on special days to remove exotic species and plant indigenous ones in New Caledonia's dry forest – Mansourian & Vallauri, 2014)
Advises project/intervention	NGO, community, company, government, academia, national forest service	Researchers providing technical advice on what to restore and where (within the landscape) in order to achieve intended objectives (e.g. support to local authorities and communities by Chiang Mai University's Forest Restoration Research Unit in Northern Thailand to restore Doi Suthep-Pui National Park – Elliott et al., 2012).
Monitors progress of FLR project/intervention	NGO, community, government, company, academia, national forest service	Local communities measuring progress with respect to forest restoration (e.g. local communities in Tanzania engaged in simple monitoring of forest restoration – Funder, Danielsen, Ngaga, Nielsen, & Poulsen, 2013)

and stand more chance of long term sustainability. It is also necessary however to understand the motivations and pressures from powerful groups at diverse levels influencing the landscape and how these power imbalances can be corrected (e.g. Bryson 2004; Redpath et al., 2013).

Some stakeholders may benefit from the restoration effort, while others may lose. The roles outlined in Table 1 reflect how stakeholders can be engaged in FLR (as seen in different restoration projects). These roles may also be generated at different levels. For example, monitoring the ecological and human impacts of restoration actions may take place at the local level and these may then be aggregated as the number of hectares restored at global scales.

When it comes to engaging stakeholders, different methodologies exist (e.g. Glicken 2000; Lynam, De Jong, Sheil, Kusumanto, & Evans, 2007). For example, in Vietnam, the project "Management of Strategic Areas for Integrated Conservation" (MOSAIC) brought a range of landscape stakeholders together around a basic 3-D model of their landscape (an area covering 30,000 ha) to identify and agree on key elements (e.g. rivers, agricultural land, forest, wildlife reserves etc.) within the landscape, including agreeing on contentious boundaries, with the view to negotiate interventions to shape their future landscape (Hardcastle, Rambaldi, Long, Van Lanh, & Son, 2004).

5.2.2. *Mapping stakeholder relationships*

At a landscape scale, the relationships between different stakeholders influence restoration outcomes. The architecture or configuration of governance (e.g. network, multilevel, polycentric) reflects the diversity of stakeholders and their roles in securing effective governance and FLR outcomes. A polycentric architecture allows flexible nodes of stakeholders to interact for common objectives at distinct times in the FLR process. In some cases governance may be more formal and in others more informal. For example, Brazil's Atlantic Forest Restoration Pact (AFRP) which has the ambition to restore 15 million ha of Atlantic Forest by 2020, has been developed by local stakeholders to ensure that individual restoration initiatives add up to more than the sum of the individual parts. Whereas scattered restoration initiatives had been taking place in the Atlantic Forest in Brazil for decades (Pinto et al., 2014), limited progress was truly visible. As a result the AFRP was designed in 2006 and launched in 2009, re-grouping about 250 stakeholders and consisting of a total of seven structures and instruments under a polycentric governance structure (Brancalion et al. 2013; Pinto et al., 2014). It formalised what was until then a series of more informal arrangements bringing diverse stakeholders together, strengthening relationships and collaborating around a common cause.

Sayer et al. (2013) proposed ten principles for a landscape approach, of which Principle 2 refers to "Common concern entry point" which recognises that different stakeholders will enter into the negotiation for a landscape outcome with different interests. A negotiated outcome for restoring the landscape will require acknowledging and understanding these divergent interests, seeking to build from them and bridging differences (Redpath et al. 2013). For example, in the Puget Sound (USA) restoration programme, networks of stakeholders including tribal, federal and state authorities, business and NGOs were mapped. Results highlighted the importance of reaching a common interest as a means to build relationships so as to collaborate effectively towards a common restoration outcome (Sayles & Baggio 2017).

Power relations among stakeholders are an important component of governance (Nagendra & Ostrom 2012; Redpath et al. 2013; Kozar et al. 2014). In the context of changing land use, such as forest restoration, relationships of power will predominate (e.g. Barr & Sayer 2012). Some stakeholders will be more powerful because of the money they bring, their knowledge, their ties to the landscape, *de jure* ownership and use rights etc. The balance of power between different stakeholder groups is also likely to shift over the course of a long term restoration project (Bryson 2004). For example, in Madagascar's Fandriana-Marolambo landscape, while international NGOs continue to exert some influence on the FLR project underway since 12 years, the role, power and recognition of local community groups have grown significantly over that period (Mansourian et al. 2016).

While there may be a desire to establish strong relationships between stakeholders that go beyond power, the reality is that power relationships override any others when it comes to restoring forests. For example, initiators of an FLR project are themselves a key stakeholder group and in most cases, by virtue of the funding they bring, they are a powerful group whose role in potentially skewing governance related to FLR should be recognised. Understanding governance as a process helps to identify evolving power

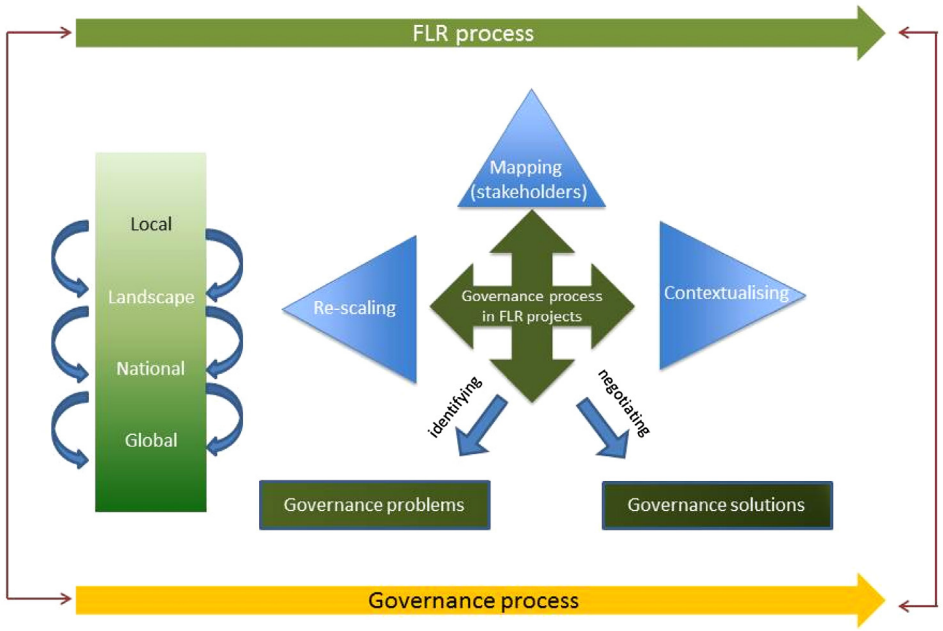

Fig. 2. Governance processes in FLR require re-scaling, mapping stakeholders and contextualising to identify governance problems and negotiate solutions in support of FLR.

relations among stakeholder groups (e.g. Bryson 2004; Mansourian 2016). When entering negotiations on goals and implementing FLR, these relationships and the interests brought to the table by different stakeholders will shape outcomes. As such, they need to be clearly understood and FLR responses should accommodate these differences.

In summary, in an FLR process, it is important to identify all relevant stakeholders and engage them at the appropriate level. A realistic balance needs to be struck between the over-simplification of categories of stakeholders, and individual engagement of stakeholders. Power constraints will affect stakeholder engagement and need to be understood. Evolution of existing stakeholders and participation of new stakeholders need to be accommodated over the course of the FLR process.

5.3. *Recommendation 3: contextualising the FLR process*

Broader contextual factors have an influence on the process of FLR (Görg 2007; Wyborn 2015). Adger et al. (2003) highlight the importance of historical and cultural context to environmental decision-making. For example, in Madagascar's Fandriana-Marolambo FLR programme, a much larger number of facilitators than initially planned had to be brought into the project to work with the diverse local communities present in the landscape (Mansourian & Vallauri, 2014; Mansourian et al. 2016). Contextualising FLR limits the possibility of extrapolating general rules and providing normative advice. Associating context and stakeholders serves to understand motivations and determine effective, locally-relevant, engagement strategies. Understanding political and socio-economic contexts influencing the landscape is also essential. They can include: level of poverty, level of dependence on the forest and its goods and services, democratic processes, cultural aspects related to the importance of trees in the landscape, relevant policies, informal institutions, among others. Edwards and Steins (1999) further distinguish remote from local contextual factors. Ecological contexts will also be important, notably the level of understanding of a given ecosystem, amount of data available and extent of monitoring which will all determine the effort necessary for restoration, and also whom to involve and how, based on existing nodes of expertise. All of these will determine not only the feasibility of FLR, but also the focus of governance efforts. For example, in Paraguay – as in many other countries – the lack of national land tenure data impedes progress on restoration since forest- and land-owners are not identified. Furthermore, all too often such challenges are perceived as static when in fact they evolve over the course of the FLR process (Jordan 2008) and require regular re-assessments. Contextualising FLR and the different governance arrangements influencing the FLR processes enables adaptive management. In the framework of two evolving processes (FLR and governance) constant adjustments will need to be made in response to changing contextual factors (e.g. Olsson et al. 2007).

In summary, contextualising provides a means of ensuring that opportunities can be seized and also that stakeholders' desires and constraints can be understood.

Fig. 2 portrays the relationship between re-scaling, mapping stakeholders and contextualising. Situating FLR within the landscape but all the while recognising and assessing influences from other scales is key to interventions in a dynamic social-ecological system. Understanding the governance context helps to identify governance problems, and in turn framing FLR around stakeholders and the broader contexts will help to reach negotiated governance solutions.

6. Conclusions

As a dynamic process, FLR is impacted on by governance and in turn the FLR process impacts on governance. This complex two-way relationship requires a thorough understanding of how, when, what and who is involved as well as zones of intervention.

Understanding, influencing and shaping governance can support effective FLR implementation. Essential technical decisions for the FLR process relate notably to the objectives for restoration in the landscape, the species and methods to be used, the timing and seasons to consider. In parallel, there are governance questions relating to who decides what species to plant and where? who benefits and

who loses from the change in land use? What institutional aspects support or hinder such interventions and who designs or adapts these? In this way, the governance and FLR processes are closely intertwined (Mansourian 2016).

While framing the FLR and the governance processes within landscapes is important, the arbitrary and dynamic nature of landscapes and their integration within a range of spatial and temporal scales, signify that the linkages between the landscape and other scales as well as between landscape stakeholders and others, require recognition and attention (e.g. Cowell et al. 2015). Polycentric governance recognises this loose yet structured association between stakeholders at all scales and provides a means of considering the roles and impacts of different nodes operating at different scales in support (or in hindrance) of FLR.

A simple framework was proposed, focusing on understanding governance problems and identifying governance solutions. To do this in the context of the FLR process (or any long term and large scale forest restoration process) requires understanding at the minimum stakeholders and their relationships, understanding their context and considering different scales of influence on the landscape. There is no "one size fits all" when it comes to governance and FLR. The long term qualities of FLR and the evolving nature of both FLR and governance call for regular reappraisals so that governance problems can be turned into governance solutions for FLR.

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Appendix A. Guidance on FLR (or large scale restoration) processes and governance

Source	Tool	Mention of the term "governance"	Key governance-related guidance
Reij and Winterbottom (2015)	Scaling Up Regreening: Six Steps To Success. A Practical Approach to Forest and Landscape Restoration	In the context of two examples.	"Step 3: Address policy and legal issues and improve enabling conditions for regreening"
IUCN and WRI (2014)	A Guide to the Restoration Opportunities Assessment Methodology	NO	"articulate how FLR objectives relate to national, sub-national or sectoral policies" "Engaging key partners" "Finding an institutional home for the assessment"
Clewell et al. (2005)	Guidelines for Developing and Managing Ecological Restoration Projects, 2nd Edition	NO	"Guideline 2: Identify ownership Guideline 13. Identify the need for securing permits required by government agencies. Guideline 28. Secure permits required by regulatory and zoning authorities. Guideline 29. Establish liaison with interested public agencies. Guideline 30. Establish liaison with the public and publicize the project. Guideline 31. Arrange for public participation in project planning and implementation to fulfill cultural goals. "
SER (2004)	The Society for Ecological Restoration International Primer on Ecological Restoration	NO	NA
Vallauri et al. (2005)	An Attempt to Develop a Framework for Restoration Planning	NO	"forest landscape restoration, as developed in this book, requires a concerted approach among stakeholders and communities, to develop a shared and accepted vision and goals on the future of the landscape at issue. (. . .) should lead rapidly to tangible changes or outcomes that really engage stakeholders and people living in the region in a lasting and meaningful manner." "Very often, restorationists must start from zero to raise awareness on the state of degradation in the landscape, analyse the root causes, and then convince other stakeholders of both the need for and the feasibility of forest restoration. Depending on the context (the existing level of awareness, politics, funds available, etc.) . . .." "Experience suggests that restoration usually only works in the long term if it has support from a significant proportion of local stakeholders." "Choosing between these alternatives (. . .) will necessarily mean reconciling different points of view and opinions. Agreement can be a phased and continuing process; (. . .) The way in which such agreements are reached will naturally depend on the political and social realities of particular countries or regions; the general principle that decisions should be as participatory as possible applies throughout."
Keenleyside et al. (2012)	Ecological Restoration for Protected Areas: Principles, Guidelines and Best Practice	In the sense of "governance types" (public, private, shared, governance by indigenous peoples and local communities) Also refer to "governance mechanisms"	"Step 1. Define the problem and engage stakeholders" "Consult and collaborate with all relevant partners and stakeholders and the public and make sure any necessary governance mechanisms are established and maintained and stakeholders and partners are committed to the process."

Lammerant et al. (2013)	Implementation of 2020 EU Biodiversity Strategy: Priorities for the restoration of ecosystems and their services in the EU.	Refer to "governance structures" Propose a "governance model" for restoration that includes a project team, a steering Committee, a scientific committee and a stakeholder group (used in the sense of "management").	"It is important to put in place qualified governance structures at the various levels of planning, prioritizing and implementing for ecosystem restoration" "stakeholder involvement in all phases of the process; Stage 1: Define scope: Determine the size and composition of the team in charge of the process; Setting the initial boundaries of the planning area; Select and involve the key stakeholders; Step 2.2. Gather socioeconomic data and information Policy, Economic, Social, Technological, Environmental and Legal (PESTEL) analysis (opportunities and threats) Stakeholder analysis (stake/power matrix); Process of identification and selection of restoration sites with involvement of all relevant stakeholders"
Hanson et al. (2015)	The Restoration Diagnostic. A Method for Developing Forest Landscape Restoration Strategies by Rapidly Assessing the Status of Key Success Factors	NO	"1. A clear motivation. Decision makers, landowners, and/or citizens were inspired or motivated to catalyze processes that led to forest landscape restoration. 2. Enabling conditions in place. A number of ecological, market, policy, social, and institutional conditions were in place that created a favorable context for forest landscape restoration."

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