

Review

Co-Creating Conceptual and Working Frameworks for Implementing Forest and Landscape Restoration Based on Core Principles

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Abstract: Existing guidelines and best-practices documents do not satisfy, at present, the need for guiding implementation of Forest and Landscape Restoration (FLR) based on core principles. Given the wide range of FLR practices and the varied spectrum of actors involved, a single working framework is unlikely to be effective, but tailored working frameworks can be co-created based on a common conceptual framework (i.e., a common core set of principles and a generalized set of criteria and indicators). We present background regarding FLR concepts, definitions, and principles, and discuss the challenges that confront effective and long-term implementation of FLR. We enumerate the many benefits that a transformative criteria and indicators framework can bring to actors and different sectors involved in restoration when such framework is anchored in the FLR principles. We justify the need to co-develop and apply specifically tailored working frameworks to help ensure that FLR interventions bring social, economic, and environmental benefits to multiple stakeholders within landscapes and adjust to changing conditions over time. Several examples of working FLR frameworks are presented to illustrate the goals and needs of communities, donors and investors, and government agencies. Transparency, feedback, communication, assessment, and adaptive management are important components of all working frameworks. Finally, we describe existing FLR guidelines and what we can learn from them. Working frameworks can be developed and used by different actors who seek to initiate an FLR process and to align restoration actions at different scales and levels.

Keywords: actors; best practices; criteria; guidelines; implementation; indicators; operational framework; principles; stakeholders

1. Introduction: Process, Principles, and Practice of Forest and Landscape Restoration

Forest and Landscape Restoration (FLR) was proposed nearly 20 years ago in an attempt to broaden the thinking about reforestation beyond industrial plantations and community-level woodlots. The global extent of deforestation and forest degradation became more defined a decade later, when a spatial analysis estimated the global opportunity area for forest restoration as being greater than

1 billion hectares and was used to underpin the Bonn Challenge to initiate restoration across 150 million hectares by 2020. Subsequent refinements have increased the estimate to more than 2 billion hectares [1]. From the beginning, the objective of FLR has been to regain ecological integrity, enhance human well-being, and improve landscape functions in deforested or degraded landscapes [2,3]. Recently, the definition has become less forest-centric to integrate the restoration of degraded landscapes that encompass forest and non-forest ecosystems. The double filter criterion of FLR states that “the enhancement of human well-being and the restoration of ecological integrity cannot be traded off at the landscape level” [4]. In contrast to the practice of site-based ecological restoration to assist the recovery of forests to their reference condition or the practice of reforestation, afforestation, and forest management to create productive forests, the practice of FLR embraces a landscape approach to balance environmental and socio-economic needs [5]. FLR employs a mosaic of different types of land uses, restoration approaches, and reforestation interventions to restore functions and promote sustainable use of land and forest resources, and to protect and enhance existing forest areas for biodiversity conservation. Ideally, how to achieve the “right” balance of land uses in a landscape is based on a process of collective decision-making, negotiation, capacity building, and adaptive management by stakeholder groups that live and work in the landscape and that are supported by regional and national government agencies, non-governmental organizations, and the private sector.

Forest and Landscape Restoration is gaining momentum globally, and has become an important international policy topic in the environmental sector [6] and a major component of nature-based climate solutions [7,8]. The Global Partnership on Forest and Landscape Restoration (GPFLR) was formed in 2003 to support and influence global policy and encourage national action [1]. FLR is widely viewed by international agencies and organizations as a means toward reaching the 2030 Agenda for Sustainable Development of the United Nations [9], the National Determined Contribution of countries to the Paris Climate Agreement [10], The New York Declaration on Forests [11], and the Bonn Challenge to bring 350 million ha of deforested and degraded land into restoration by 2030 [12]. Initiatives based on FLR are underway in Latin America, Africa, Asia, and the Mediterranean [13–16]. Moving forward into the next decade, FLR is being promoted through the United Nations Decade on Ecosystem Restoration, which endorses multifunctional approaches at ecosystem and landscape scales.

In its latest formulation, FLR is defined as “a process that aims to regain ecological functionality and enhance human well-being in deforested or degraded landscapes. As a process, FLR is not an end in itself, but a means of regaining, improving, and maintaining vital ecological and social functions, in the long-term leading to more resilient and sustainable landscapes [17].” Six core principles define the essence of FLR (Table 1) and represent the current shared understanding of members of the GPFLR, a group of high-level international organizations involved in FLR policy and implementation. These principles define a holistic approach aimed to encourage aligned practices on the ground. They outline the conceptual intent of practice, and provide the basis for operational frameworks to guide effective practices.

In practice, local conditions and actions are largely shaped by landscape-level factors, and the outcomes of interventions emerge from the interaction of land uses within the landscape mosaic. These outcomes should therefore be assessed at the landscape scale, recognizing attempts to balance land use trade-offs through a multisectoral approach and including all stakeholder groups in the decision-making process. The potential benefits of FLR extend beyond increasing tree cover to include sustainable agricultural production, stabilization and diversification of local livelihoods and commercial opportunities, improved delivery and quality of ecosystem functions and services, improved social justice and well-being, increased resilience to climate change, improved habitat connectivity, and enhanced biodiversity conservation [18].

Table 1. The six principles of Forest and Landscape Restoration (FLR) based on the work in [17].

Main Focus of Principle	How the Principle Applies to Forest and Landscape Restoration
1. FOCUS ON LANDSCAPES	FLR takes place within and across entire landscapes, not individual sites, representing mosaics of interacting land uses and management practices under various tenure and governance systems. At this scale ecological, social, and economic priorities can be balanced.
2. ENGAGE STAKEHOLDERS AND SUPPORT PARTICIPATORY GOVERNANCE	FLR actively engages stakeholders at different scales, including vulnerable groups, in planning and decision-making regarding land use, restoration goals and strategies, implementation methods, benefit sharing, monitoring, and review processes.
3. RESTORE MULTIPLE FUNCTIONS FOR MULTIPLE BENEFITS	FLR interventions aim to restore multiple ecological, social, and economic functions across a landscape and generate a range of ecosystem goods and services that benefit multiple stakeholder groups.
4. MAINTAIN AND ENHANCE NATURAL ECOSYSTEMS WITHIN LANDSCAPES	FLR does not lead to the conversion or destruction of natural forests or other ecosystems. It enhances the conservation, recovery, and sustainable management of forests and other ecosystems.
5. TAILOR TO THE LOCAL CONTEXT USING A VARIETY OF APPROACHES	FLR uses a variety of approaches that are adapted to the local social, cultural, economic, and ecological values, needs, and landscape history. It draws on latest science and best practice, and traditional and indigenous knowledge, and applies that information in the context of local capacities and existing or new governance structures
6. MANAGE ADAPTIVELY FOR LONG-TERM RESILIENCE	FLR seeks to enhance the resilience of the landscape and its stakeholders over the medium and long-term. Restoration approaches should enhance species and genetic diversity and be adjusted over time to reflect changes in climate and other environmental conditions, knowledge, capacities, stakeholder needs, and societal values. As restoration progresses, information from monitoring activities, research, and stakeholder guidance should be integrated into management plans.

Tools and guidelines to support aspects of FLR planning and implementation are proliferating [19]. Several countries are developing restoration plans [20] and improving governance mechanisms in support of FLR practice [21]. Core principles have been developed for successfully implementing and upscaling Nature-Based Solutions recently adopted by the International Union for Conservation of Nature, which encompass Forest Landscape Restoration, Ecosystem-based Adaptation, Ecological Restoration, and Protected Areas [7]. The Restoration Opportunities Assessment Methodology (ROAM) is being used in over 26 countries to develop capacity and guide planning for implementing FLR at country- or sub-country-level [22]. The International Tropical Timber Organization (ITTO) is developing voluntary guidelines for the design and implementation of successful FLR in the tropics as a joint initiative of the Collaborative Partnership on Forests (CPF) [23]. The ITTO FLR Guidelines are structured by developing each of these six principles into a set of guiding elements along with proposed actions [23]. The International Union of Forest Research Organizations (IUFRO) published a guidance document for implementing FLR that attempts to operationalize FLR based on four project-based steps: visioning, conceptualizing, acting, and sustaining [24]. The Food and Agriculture Organization of the United Nations compiled a database of resources related to FLR, including monitoring resources [25]. Global progress on the results and benefits of FLR is being assessed within the Bonn Challenge Barometer in terms of four results and benefits indicators: the number of hectares under restoration, carbon sequestered, jobs created, and biodiversity benefits [26]. Moreover, several recent research works have shown how spatial prioritization approaches can maximize FLR benefits and reduce implementation costs [27–30].

Substantial funds are flowing into large international organizations and into countries to support the development of FLR programs and projects, signaling the promise of rapid uptake of FLR in many countries. The nature of FLR practice is also relevant to reaching a meaningful scale relative to the multiple objectives listed above. Private investment in conservation and restoration is growing [31,32]. From 2004 to 2015, over \$US 8 billion of private capital was committed towards conservation and forest restoration to generate both financial return and environmental impact [33]. Moreover, collectively, the corporate sector continues to engage in carbon and biodiversity offsetting strategies linked to

reforestation and conservation projects on the ground [34,35]. Nevertheless, available funding for FLR is far below the estimated \$US 837 to 1,200 billion needed [36].

Are these and other actions sufficient to achieve the substance and scale that is needed? Reversing deforestation, forest and land degradation requires aligned action at all levels of government and society. Djenontin et al. [37] highlight the many factors that influence outcomes of FLR interventions from local to national scales. The promise of FLR may be empty if the holistic process based on core principles fails to take hold on the ground and restoration and reforestation practices do not move beyond past business-as-usual approaches. Despite all the attention that FLR enjoys within the environment and forestry sector today, much of what is being sold and advertised as FLR is lacking in substance and scale [38]. Some might say that FLR is at risk of becoming a global fad that could easily follow the fate of many past failed initiatives that aimed to integrate development and conservation [39].

Based on these concerns, the Forest and Landscape Restoration Standards task force (FLoRES) formed by, among others a subgroup of the People and Reforestation in the Tropics Network (PARTNERS), with the goal of developing operational guidelines to identify and promote better outcomes and practices of FLR. This paper aims to stimulate the development of a high-level conceptual framework and linked tailored working frameworks to guide the initiation, practice, and assessment of FLR. We first present background regarding FLR concepts, definitions, and principles, and discuss the challenges that confront effective and long-term implementation of FLR. We enumerate the many benefits that a transformative criteria and indicators framework can bring to global and local actors and different sectors involved in restoration at different scales when such frameworks are anchored in the FLR principles. We discuss the need to co-develop and apply specifically tailored working frameworks to help ensure that FLR interventions bring social, economic and environmental benefits to multiple stakeholders within landscapes and adjust to changing conditions over time. Several examples of working FLR frameworks are presented to illustrate the goals and needs of communities, donors and investors, and government agencies. Our paper concludes with a compilation of existing guidelines and documents focused on ecological restoration and FLR practices. This work is based on three FLoRES workshops held in Brazil, Kenya and the Philippines from 2017–2019. These workshops included active participation of restoration practitioners, policy-makers, funding agencies, and scientific researchers from a wide variety of disciplines and backgrounds. The most recent workshop focused on developing general and specialized working frameworks for moving FLR forward through a process of engagement and co-creation.

Underlying our work is the conviction that FLR is a process that emerges from local landscape contexts and engagement of local stakeholders working together to co-develop effective frameworks to guide action and outcomes. To be useful, FLR frameworks need to be flexible and incorporate adjustments over time in response to changing conditions within landscapes and surrounding regions. The core principles of FLR provide a reasonable and stable foundation for developing conceptual and working frameworks for implementation and assessment. Creating working (practical) guidance and implementation frameworks based on core principles that are co-designed and used by different actors and stakeholders can help to ensure that FLR reaches its full potential to transform lives and landscapes.

2. Challenges for Implementing FLR and Achieving Long-Term Outcomes

Despite its 20-year conceptual history and recent wide adoption in the language of global restoration initiatives, the reality is that FLR has so far failed to demonstrate the full scope of its transformative potential [40,41]. FLR has strong aspirational value and conceptual foundations, but is hard to implement and demonstrate in practice. One main reason is that FLR is inherently multidimensional, incorporating biophysical, political, socioeconomic, and governance dimensions that are challenging to integrate, assess, and monitor at the landscape scale [39,42]. Creating effective landscape governance mechanisms [43] and developing meaningful leading and lagging indicators of social and ecological outcomes [44] are among the steps that need to be taken so that the world can

benefit from the full potential of FLR as an approach for large-scale restoration. Leading indicators are used to predict the likelihood of particular outcomes, whereas lagging indicators assess realized outcomes. For example, benefit sharing arrangements and secure land tenure are leading indicators of socio-economic outcomes of FLR, whereas availability of forest products and water quality are lagging indicators [44]. Here we consider four main categories of challenges: (1) recognizing FLR interventions and measuring outcomes, (2) institutional and governance challenges, (3) financing challenges, and (4) technical challenges.

2.1. Challenges in Recognizing FLR and Measuring Outcomes

FLR can emerge from many different starting points and can have many different options and components. FLR does not follow a predefined blueprint but relies on continuous stakeholder engagement and adaptive management to determine priorities, assess effectiveness and apply corrective actions as needed. Interventions, desired outcomes and how these are located in space and time need to be tailored to conditions, needs, and their dynamics within individual landscapes.

The term landscape is itself difficult to define operationally. Sayer et al. (2007) use the term to describe a “Geographical construct that includes not only the biophysical components of an area but also social, political, psychological and other components of that system” [45]. Others prefer to use the term territory, which refers to spatial units that are delimited by ownership, responsibility, entitlements, and governance of areas of land [46]. Furthermore, restoration activities within a landscape can impact areas outside of landscape boundaries, and processes outside of a landscape influence practices and outcomes of restoration within a landscape. Consequently, the spatial (and temporal) scale of interventions and outcomes often do not match [47] and do not always align with political jurisdictions, creating particular governance and management challenges [43].

Interventions that are part of an FLR process can be difficult to distinguish from other interventions that are not linked to FLR. For example, commercial monocultures using exotic species can be an important component of FLR, but as sole interventions, they do not generate a broad spectrum of ecosystem services or enhance local biodiversity [48]. FLR interventions require integrating multiple actions at different spatial and temporal scales by multiple stakeholders. Such interventions, which by practical necessity will be of a far smaller scale in time and space than the FLR process of which they are part, can take many forms. These complexities make it difficult to recognize where and when the FLR process is happening on the ground. A framework, perhaps consisting of criteria and indicators, anchored in the FLR principles can help to identify how specific FLR practices on the ground can be integrated to achieve more far-reaching and long-lasting outcomes and impacts that feed back to promote and sustain a socio-ecological restoration system [49]. No such framework yet exists, however.

The non-prescriptive nature of FLR is often viewed as its greatest attribute, as it offers flexibility and permits adaptation to each local context. However, it can also lead to “cherry-picking” certain actions and neglecting others. FLR implies different things to different people. Mansourian [50] describes five different constructs for FLR, and Erbaugh and Oldekop [51] illustrate three distinct FLR pathways. Many NGOs, national, and subnational governments have become champions of FLR without mapping the extent to which their interventions are linked to FLR processes [37]. Vagueness can also become crippling because there are no basic rules or norms to follow [50]. Existing voluntary guidelines (Table 2) do not focus on how to measure or value holistic outcomes specific to FLR that reflect its underlying principles. These outcomes include “state” as well as “process” variables. Existing monitoring tools are often divorced from the bottom-up approach embodied in the FLR concept [52] and could mislead practitioners and stakeholders into claiming they are practicing FLR when they may not be.

In addition, well-documented case studies of FLR are lacking. Few studies clearly document the evidence base for the effectiveness, outcomes, and impacts of FLR interventions [53]. Integrated landscape approaches, including FLR, face many institutional and governance barriers, and their effectiveness has not been adequately demonstrated [54,55]. Reed et al. (2017) [56] failed to find

a single reported case of landscape approaches in the tropics that effectively balances social and environmental trade-offs through multi-level governance structures. Case studies and success stories provide motivation and enthusiasm for FLR, but often fail to recognize failures or missed opportunities.

Confirmation bias is widespread when reporting FLR outcomes. Beyond their value in providing inspiration, brief case studies and stories are of little use to researchers, practitioners, and implementors looking for local solutions and for drawing emergent lessons, especially if there is no clear evidence of the immediate or long-term impact of reported FLR interventions. Implementation efforts are reported as exemplary cases of FLR without clear context regarding how these efforts depart from business as usual approaches or how the outcomes are linked to FLR principles. In part, this loose application of FLR stems from the flexible and contextual nature of FLR practices, rendering useless a one-size-fits-all standard. However, another underlying factor is that project-level implementers are under pressure to report positive outcomes and gloss over problematic issues. Here, it is important to emphasize that FLR is not a brand, and the FLR “label” is in jeopardy of losing its integrity and potential as a transformative approach.

2.2. Institutional and Governance Challenges

FLR is initiated and governed by local communities, national and/or subnational government agencies, or NGOs, so the specific interventions taken need to align with organizational or government mandates and agendas of these entities [43]. These actions are often constrained by historical, institutional, and technical factors. Simply put, there is not always “freedom to move” in ways that lead to a deliberate and recognizable FLR process that depart from the status quo. Over time, institutional and sectoral agendas can cause outcomes to be directed towards narrow goals that do not encompass the wide scope of FLR [37].

Local leadership, trust, and social cohesion are critically important ingredients of representative and long-lasting FLR [57–59]. In addition to the role of impassioned and charismatic individuals, the support, collaboration, and alignment of local institutions, professional associations, community groups, and government agencies are essential to reverse entrenched unsustainable and unjust practices within landscapes and territories. Implementation and sustainability of FLR in landscapes may require changes in local governance, power structures, and entrenched corrupt practices [43].

FLR is a multi-stakeholder-based process [60,61] that cannot be confined to the scope of a short-term project [62]. When local stakeholders are not driving the FLR processes, the likelihood of long-term success greatly diminishes. Governance arrangements should be in place to ensure that stakeholder involvement is meaningful, gender responsive, and minimizes power imbalances that can occur regardless of implementation by local groups or external agents [39,63]. Local agency and sustained involvement are fundamental to co-create a long-term pathway that develops as a process on the ground.

2.3. Challenges in Financing FLR

Although well-developed business frameworks that apply to FLR have been put into practice [63], few business models for holistic FLR are being implemented [64,65]. Investors increasingly view FLR as an option for impact investment based on a bottom line favoring commercial production and profits, which may not always provide an adequate balance of benefits for local people [66]. Similarly, companies investing in carbon insetting direct their focus to actions that are typically linked to the company’s supply chain, and are therefore driving agendas of relevance and profit to the company’s stakeholders [67]. Carbon insetting can be defined as “a partnership/investment in an emission reducing activity within the sphere of influence or interest of a company, whereby the GHG reductions are acknowledged to be created through partnership and where mutual benefit is derived.” [67]) Whereas NGOs hold different models of funding [68], there is a growing need for NGOs to seek out innovative finance. FLR initiatives that rely on either impact investment or insetting will need to educate investors on the need to look beyond commercial activities as well as on the need to fund

essential social interventions to fully and successfully implement FLR processes. Clearly, market drivers of FLR activity will be critical for reaching scale and impact and for stimulating innovative economic solutions that enhance livelihoods, provide job security, and raise income levels. For this reason, it will also be important for investors to pay close attention to what happens on the ground and to encourage collection of baseline and monitoring data to assess the socio-ecological consequences of commercial, for-profit interventions.

The time scale for unfolding of FLR outcomes poorly matches time scales of funding and program/project cycles. Trees are long-lived organisms and require time to produce socio-economic and environmental benefits. FLR is therefore a long-term process that unfolds over time using monitoring and evaluation, stakeholder participation, and adaptive management to determine which tree species, interventions, practices, and outcomes prove to be most effective to meet local objectives. The short time-spans of project financing and development are usually incompatible with implementation for long-term impacts [69]. Rapid deployment of funding, expertise and political will are often insufficient to sustain implementation and monitoring efforts over the timeframes needed to detect impacts, facilitate learning, and improve frameworks and processes [42].

2.4. Lack of Technical Capacity and Decision Support Tools

In many developing countries, technical capacity and decision support tools are insufficient to initiate, implement and sustain effective FLR [19]. Local stakeholders with expertise in an area may lack the full range of skills and technical knowledge needed for the task. Practitioners need clear guidance regarding specific steps to take to operationalize the principles of FLR. Inadequate local institutions and poor governance provisions also restrict active engagement and benefits for local people. Many government agencies remain focused on narrow, traditional approaches to reforestation or land rehabilitation that provide restricted social or environmental benefits that tend to favor certain groups of stakeholders over others. These include large-scale tree-planting initiatives based on monocultures or exotic species, which may fail to generate multiple benefits for local people [70]. Accessible and evidence-based guidelines regarding collecting baseline data, visioning landscape options, defining landscape boundaries, selecting appropriate tree species and locations for planting, prioritizing areas for assisted natural regeneration, assessing implementation and opportunity costs of restoration interventions, and monitoring indicators of social and ecological conditions are urgently needed for ready application within landscapes.

Unleashing the potential for FLR may also require developing the capacity for different stakeholder groups to work together in multi-stakeholder coalitions including different agencies, community groups, and institutions [61,71,72]. The collaborative use of decision-support tools and development of scenarios, maps, and restoration plans can help to engage different groups of stakeholders in this process. This section illustrates that it is not easy to undertake FLR or to recognize when it is happening. Addressing all of the FLR principles at the onset is rarely possible. The FLR process unfolds over time and often requires revising more narrowly focused prior practices.

3. Working FLR Strategies and Frameworks Based on a Shared Conceptual Framework

FLR can follow many potential paths, and they are not all straight. Implementing FLR as a process can benefit from a practical working strategy to define, plan, initiate, sustain, scale-up and adapt interventions to address changing local needs and changing environmental conditions. Reij and Winterbottom [73] outlined such a strategy in their presentation of six steps to scale up greening in the West African Sahel. Their strategy involves six major types of activities (“steps”) to be taken by development practitioners or other groups that are committed to promoting tree establishment in drylands (Table S1). These steps are not necessarily sequential, nor are they meant to be prescriptive. The specific country and landscape context is essential to tailor these components to design scaling activities that are adapted in space and time. Another approach is to develop a flow chart of steps used in landscape interventions. Boedhihartono and Sayer (2012) [60] illustrate such an approach that is

particularly useful when outsiders are imposing interventions in a landscape. First, implementers listen and learn through stakeholder input. Then interventions are assessed regarding their alignment with national level priorities. Then a range of techniques and scenarios are explored with multi-stakeholder groups to establish specific goals and indicators of progress. This stakeholder platform analysis is periodically reviewed and adapted to changing conditions. For decisions regarding what type of interventions to apply under specific circumstances, decision trees can be useful decision-support tools [74].

The key to making FLR happen lies in unfolding a process within landscapes that fulfills the core principles (Table 1), leading to actions that reverse the course of land degradation and deforestation. This implies that while all FLR processes are distinct, they all share the core defining elements of FLR. A conceptual and overarching FLR framework could lay out the higher-level architecture on which to construct FLR processes on the ground. Such a framework can be adapted and contextualized by different groups of FLR implementers, avoiding having to reinvent the wheel. For example, within a working framework, principles can be added or shaped to generate a process that is particularly relevant to address specific landscape contexts.

The understanding and implementation of a multidimensional and holistic process such as FLR requires both conceptual and working (operational) frameworks for guiding its initiation and progress, and for monitoring its progression. Guidelines and indicators based on frameworks to achieve specific objectives can be useful for monitoring and assessment of FLR interventions, but do not always emphasize the integration of core principles and may neglect critical aspects while emphasizing others. Although there is a need to achieve and document outcomes and benefits in the short-term, the full range of social and environmental benefits of FLR can only be achieved over a longer time frame of at least several decades. Available project indicators, performance scores, and monitoring frameworks are useful for making short-term assessments of project and/or intervention outcomes, but they do not provide a mechanism to ensure that discrete interventions are aligned with the core principles of FLR (Table 1) or that the process of FLR will be sustained so that its full, long-term potential can be achieved.

Guidance frameworks for the implementation and assessment of restoration work exist (Table 2), but most of these have not been useful in the context of FLR. A single performance-based standard cannot apply to the many different forms and flavors of FLR that are practiced or will be practiced in the future. Clearly, a flexible approach is needed to adopt frameworks for action and for ensuring adherence to the core FLR principles.

3.1. A Shared Conceptual Framework

As a first step, is it critical to establish a core set of principles that is accepted by the FLR community. Members of the FLoRES task force worked with the GPFLR in 2018 to produce a shared and accepted version of the principles of FLR (Table 1). Our approach seeks to guide FLR implementation in ways that directly emerge from these core FLR principles. A widely accepted and adopted manner to operationalize a set of principles is through a Criteria and Indicators (C&I) Framework [75,76]. Typical principles, criteria, and indicator (PCI) frameworks are hierarchical and linear. However, with the emergence of systems thinking, it is also possible to envision a networked PCI framework in which some criteria and indicators are linked to more than one principle, defying hierarchical and linear constructs. A higher-level conceptual FLR framework may need to adopt a network-based architecture as it more closely represents the complexity of the FLR process; it manifests the interconnections across principles and criteria and highlights the nonlinear relationships among landscape elements. Although a generalized and comprehensive conceptual PCI framework would not be suitable to apply to any particular context, it can provide a template (tool) for selection of appropriate criteria and indicators for tailored working frameworks in alignment with FLR's core elements.

3.2. Working Frameworks

Practical and operational working frameworks for FLR could be used to assess progress using indicators that measure adherence to principles rather than solely focusing on performance metrics based on project objectives. These working frameworks should be useful for guiding adaptive management and addressing paths toward implementation and integration of new actions to improve landscape functions and governance. FLR is a voluntary action that is not mandated by law, although some countries, such as Brazil, have legal mandates for property-based restoration [77]. Although a global standard for the design and verification of nature-based solutions is under development, there is no system of norms or standards for assessing FLR progress based on adherence to core principles. A uniform system would be inappropriate given the wide range of conditions and contexts where FLR is to be implemented. Actions that are viewed as progress in one context may not be viewed as progress in another context.

In line with the conceptual framework, a working framework for FLR could also take the form of a network diagram rather than a table (Figure 1). In this example, derived from a table by Salazar et al. (2005) [78], three principles are used to illustrate interconnections of goals and indicators for assessing FLR in Hojanca County, Costa Rica. The indicators shaded in purple describe the status of ecosystem services that are linked to both c 1.1 and c 2.1 (goals,) which are linked to two different principles. The indicator shaded in blue-green, economic compensation of landowners, links to both goal 2.2 (fair distribution of benefits) and goal 3.1 (national policies).

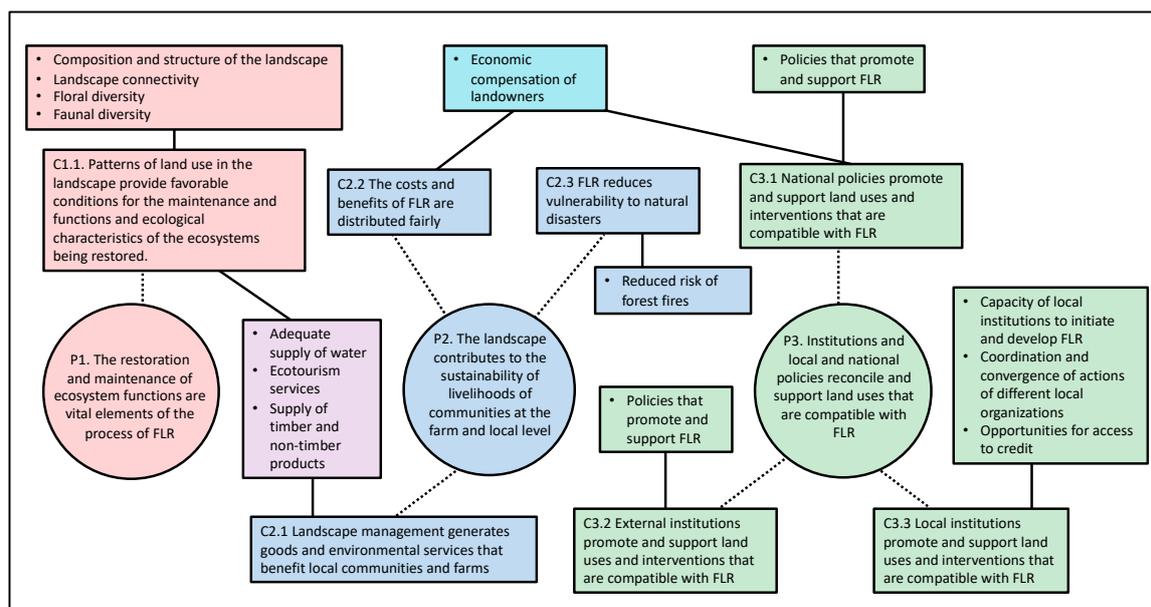


Figure 1. A working framework for the evaluation of forest and landscape restoration in Hojanca, Costa Rica based on Salazar et al. (2005) [78]. Three color-coded principles (P1, P2, P3) are shown in circles and associated goals (C1.1, C2.1, C2.2, C2.3, C3.1, C3.2, C3.3) are in boxes. Indicators for meeting goals are in boxes with bullet points. Links between principles and goals are in dashed lines, whereas links between goals and indicators are in solid lines.

At the landscape level, a network diagram approach highlights how particular criteria (or goals) and indicators can be achieved through different types of interventions and when anchored on the conceptual FLR framework, how these actions are linked to FLR principles. This approach could highlight which components or criteria of FLR are already in place, which components need to follow, and how these could be implemented over time. Some criteria may be contingent upon others, so an FLR strategy could define a temporal progression of steps to satisfy those criteria. While adhering to the FLR conceptual framework, FLR implementers as well as donors and funding agencies could

draw from a set of options to construct a tailored C&I framework that helps to guide the progression of FLR implementation and assessment. This framework transforms principles into a working strategy. In the example in Figure 1, the three principles do not capture the complete essence of the six core FLR principles. However, had a conceptual framework existed, developing a working framework for the Hojancha FLR process would have been easier to accomplish.

Frameworks can be based on principles developed independently, but in-line with the six core FLR principles. For example, Bustos Linares (2018) [79] developed a principal-criteria-indicator framework to advance FLR implementation in four Model Forests in Latin America. This is an excellent example of a working framework. This work focused on clarifying the social, economic, and political dimensions of FLR, and the importance of negotiation and cooperation between different stakeholders and actors. Her framework was based on five core principles that are central to Model Forests, 19 criteria, and 48 indicator descriptors, which collectively serve as a guide for planning and monitoring landscape-scale restoration activities. In Figure 2, the five principles are shown, along with the 19 criteria. Although each principle has a unique focus, many of the criteria are clearly linked to more than one principle, demonstrating that a networked display is more meaningful than a hierarchical table. The representation of interconnections also serves to clarify conditional relationships among elements, helping practitioners to develop a more nuanced theory of change and optimize the effectiveness of activities on the ground. This example also illustrates the importance of tailoring the core principles to the relevant context. For example, the stakeholders in these Model Forest landscapes placed a strong emphasis on controlling market forces that can drive ecosystem degradation and promoting enabling factors to meet their political, economic, and social needs [79].

Active involvement or co-creation of FLR frameworks places responsibility on the stakeholders and actors engaged in restoration planning and implementation. Actors become empowered to understand how core principles are linked to specific criteria and indicators of importance to their local context and that best utilize their existing local capacities and institutions. Through visualizing outcomes, stakeholders can decide how they can be assessed using specific indicators. The engaged and empowered actors become owners, designers, and stakeholders of the FLR process as it unfolds in their own landscape. In some cases, the capacity to develop stakeholder based working frameworks may not be sufficient when FLR activities are initiated, but as the understanding of the potential and need for FLR guidance grows over time, frameworks can begin development to guide future actions and to align them within a region or country.

A conceptual FLR framework can be used to derive working frameworks tailored to different contexts and purposes. From one generalized FLR framework, a family of specialized FLR frameworks can be developed that address practical approaches and a range of indicators that signal progress in policies and enabling factors, outcomes of interventions, and ongoing processes. Such an approach can facilitate knowledge sharing since it can help stakeholders apply their working frameworks to related and overlapping frameworks created by other actors engaged in the FLR process at different levels.

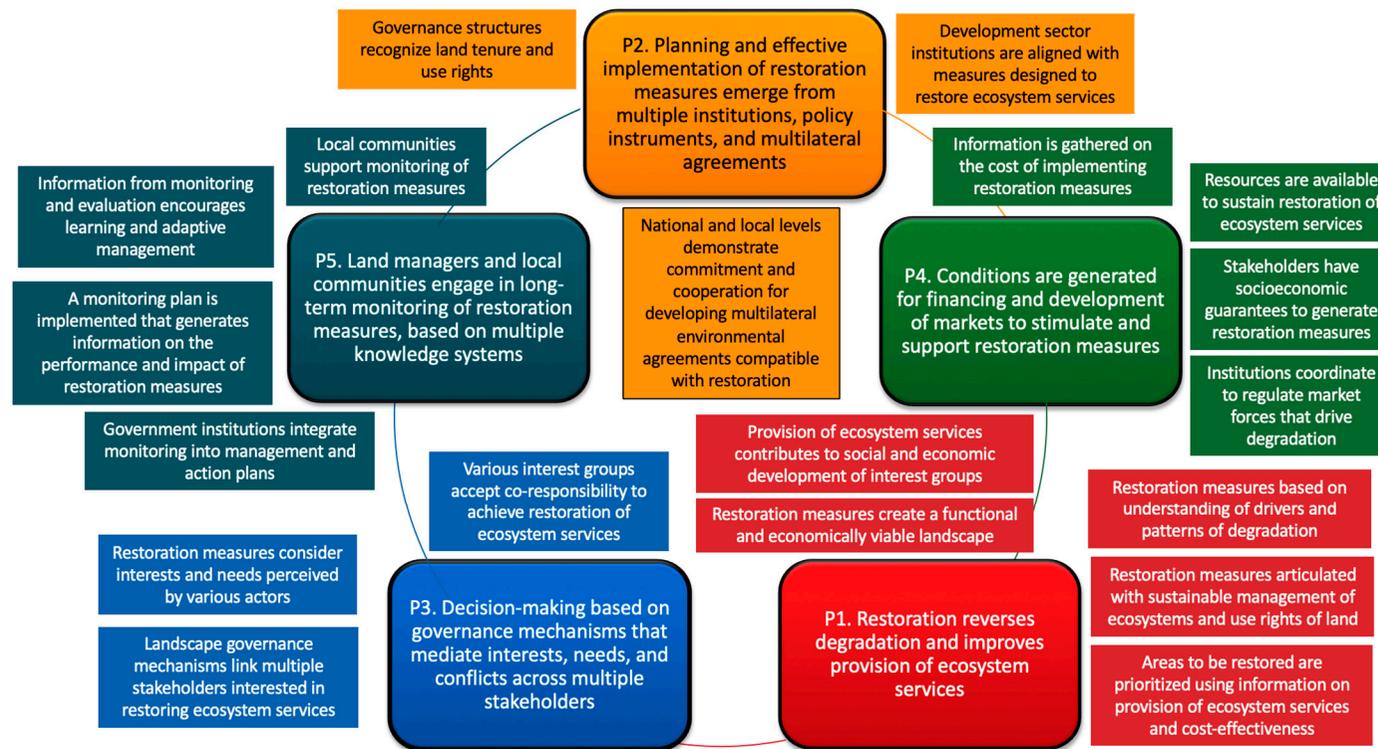


Figure 2. A principles and criteria framework for Forest and Landscape Restoration for Chorotega (Costa Rica), Risaralda (Colombia), and Pichanaki and Villa Rica Model Forests (Peru), based on the work in [79]. The five principles (P1–P5) adopted here are represented by different colors, along with their associated criteria. This figure does not include indicators for lack of space.

3.3. How Different Actors Can Co-Develop Working FLR Frameworks

Different types of actors and stakeholders in the FLR process (community groups, local governments, national governments, non-governmental organizations, and donors) operate within different spatial and temporal scales and are driven by different mandates and priorities. Thus, different actors may benefit from developing and applying specialized types of working frameworks and guidelines that are derived from a higher-level conceptual FLR framework.

- Local landowners, land managers, and communities that seek to practice FLR or enhance existing community-based restoration and reforestation can develop working frameworks to chart a FLR pathway or strategy that gradually adds components and criteria over time using adaptive management approaches.
- Local, regional, and national governments: tailored FLR working frameworks can be used to optimize spatial locations for different interventions within landscapes, to assess the level of stakeholder engagement, and to construct a set of social and environmental indicators to track outcomes and apply adaptive management.
- Non-governmental organizations that work to improve livelihoods or enhance biodiversity conservation through implementing and supporting FLR interventions on a project basis, a working framework can identify interventions and indicators that are directly linked to livelihood improvement, more effective governance, or to biodiversity conservation and would initially emphasize these aspects.
- Funding agencies, impact investors, and donors place a high importance on financial viability, impact, accountability, and transparency. Therefore, selection criteria and management protocols must ensure that core principles and values are upheld to reduce the risk of investments. To evaluate whether the actions and outcomes of investments in the name of FLR actually conform to the core principles, these actors could develop a criteria and indicators framework that emphasizes stakeholder-driven processes, landscape-level scope and approach, adequate time scale for unrolling FLR, economic and financial viability and profits, transparency of interventions and costs, and effective monitoring of social and environmental outcomes.

At the 2019 workshop in Tacloban, Philippines, participants broke up into three groups to explore how different actors or stakeholder groups might develop tailored FLR working frameworks [80]. One group took the perspective of a community group that was initiating FLR in their landscape. Their framework was built on five major issues: (1) social relationships, (2) assessments, (3) products and benefits, (4) structures of decision-making, and (5) activities (Figure 3). From the community perspective, whether this activity was viewed as FLR or not did not matter as long as basic community concerns were addressed.

The second group took on the role of donors who seek to support FLR activities. These include international bilaterals, impact investors, corporate sector investors, philanthropists, and public–private partnerships. The first element of an FLR framework they would require is a business case that would be the basis for a financial analysis of returns (both monetary and non-monetary) and would inform risk analysis. An exit strategy would also be required. Donors would need to accept the reality that the time frame for funding is incommensurate with the time frame for returns on their investment. Long-term sustainability, stability of supply chains, and insetting are other issues of importance to donor groups that would increase attractiveness of investments. The monitoring of outcomes of restoration measures is also important to donors in relation to specific objectives such as carbon storage, numbers of trees planted, improvement of ecosystem service supply, and human well-being. The co-development of FLR frameworks can be an important approach to reduce risk of investment in a competitive market for financing.



Figure 3. A working FLR framework from the perspective of a community group developed by participants of the 2019 Tacloban workshop. This framework emphasizes planning and working together in a transparent way, strengthening capacity and communication, distributing benefits, improving well-being, and learning about the landscape to produce different types of products through restoration.

The third group assumed the role of government agencies (or cross-agency task force) tasked with restoring forests and coordinating FLR activities at the national level. In this case, the demand for restoration comes from the top levels of government. From this perspective, a working FLR framework has six main elements (Figure 4). The first element is to ensure that all of the actors within these agencies have a clear concept of what FLR is and how adopting FLR is aligned with other national agendas. Then, a policy framework is needed that identifies existing policies, barriers, and risks. Targets and indicators would then be defined at national levels, based on the creation of national level platform for cross-sectoral alignment and ROAM process for identifying and prioritizing restoration opportunities. At the subnational level, multi-sectoral platforms would be established to set local objectives, and provide training and transparent feedback to higher levels. Participatory monitoring and evaluation compose an additional element of the FLR framework along with regular reassessment based on successes and failures.

This workshop exercise emphasizes that each of these actor groups has their own “bottom line” regarding what is achievable and acceptable within an FLR framework. Different entities involved in FLR have important perspectives and needs, thus the co-development of working frameworks is an important first step in the process. Compatibility of working frameworks across different scales requires further exploration, but is likely to be possible given that they are all based on a common set of shared principles. Transparency, feedback, communication, assessment, and adaptive management are important components of all working frameworks. These components are essential foundations of good FLR practice, regardless of the level of implementation.

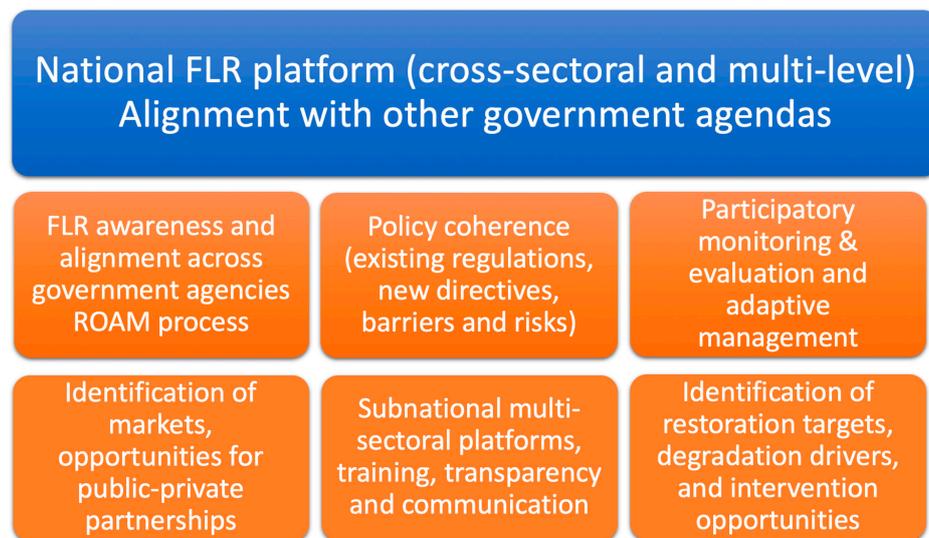


Figure 4. A working framework from the perspective of a top-level government agency tasked with coordinating national FLR activities, developed by participants of the 2019 Tacloban workshop.

3.4. Uses and Benefits of Principles-Based Working FLR Frameworks

As the FLR movement transitions from commitments to actions, it is vital to pay close attention to the outcomes of restoration interventions and how they unfold over time. Do these outcomes, viewed at the landscape scale, conform with the core principles of FLR? FLR processes need to be sustainable in the long-term and bring significant benefits to people, the environment, and the planet. In theory, fulfilling the broad aims of FLR is a reward in itself. However, in practice, deliberate steps need to be taken to ensure that these broad aims are achieved. Working FLR frameworks could be used by different groups as:

- A self-assessment tool for communities, NGOs, and local government agencies to evaluate FLR progress and identify missing elements/components to improve the quality of outcomes.
- A way for investors to favor investments with lower risk and that lead to successful social and environmental outcomes.
- A tool for national or international foundations or donors selecting FLR projects to prioritize, support, or use as inspirational models.
- A way to promote knowledge exchange among regions and ecosystems, as a shared framework and data generation, and as a robust tool for reporting on restoration commitments.
- A tool for independent validation and verification for organizations.
- A way to increase credibility, transparency, and stakeholder trust in the FLR process.
- A way for funding agencies to coalesce investments focused in specific restoration outcomes, like biodiversity conservation, carbon sequestration, and watershed services, into a single large and integrated program.

Actors and stakeholders have much to gain by co-creating and applying working FLR frameworks (Figure 5). In the case of the Model Forest framework [79], groups of people living in landscapes where FLR is being practiced can use the framework as a tool to create a shared vision of what their landscape will look like and what kinds of products and ecosystem services could be generated from restoration implementation and sustainable management of natural resources. Tailored working frameworks will consider criteria and indicators for the fair distribution of economic benefits for resolution of conflicts and power imbalances. On the environmental side, a FLR framework would include criteria and indicators for achieving sustainable practices in agriculture and forestry and for developing landscape stewardship. Criteria and indicators would also focus on ensuring protection of local biodiversity and quality of ecosystem services.

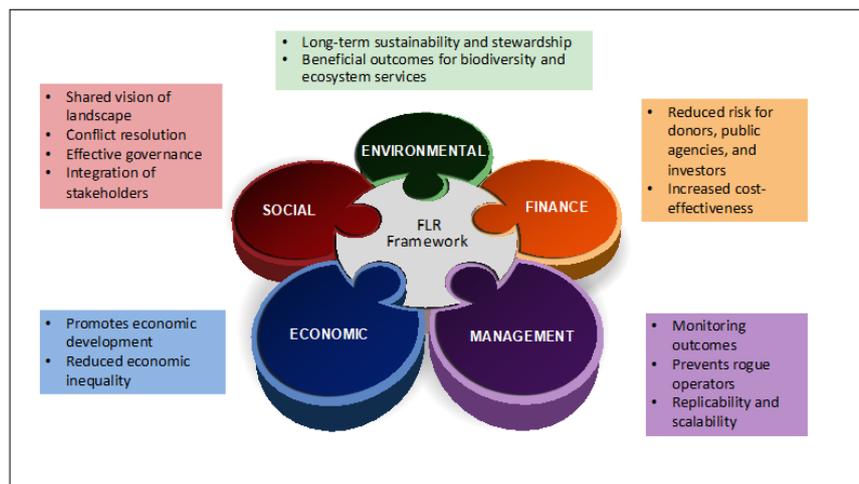


Figure 5. The many benefits of developing and applying FLR working frameworks based on core principles.

From a financial perspective, donors, public agencies, and investors will find the application of the conceptual and working FLR frameworks useful to increase cost-effectiveness and reduce risk, due to increased focus on the quality of FLR interventions they are supporting. Investors, government agencies, and NGOs with an interest in supporting FLR can use FLR frameworks to assess where their investments will be most likely to produce the outcomes they want to support and to engage true partnerships for producing other benefits (sharing information and technology, publicizing successful outcomes, gaining political support, and promoting legal instruments).

FLR working frameworks are tools to promote and guide economic development of FLR processes. A working framework helps to prepare stakeholders for implementing practices that will lead to successful FLR outcomes. From a management perspective, a FLR framework facilitate more effective monitoring and assessment, promote the legitimacy of interventions, and provide a mechanism for scaling up of successful landscape models. For example, within a region or country, different communities or organizations can share their working frameworks so they can be modified to apply in other areas, helping to scale up the process where relevant and possible.

4. What Can We Learn from Existing FLR Guidelines?

As FLR is a voluntary activity, enforcement and mandates of specific actions are not standardized. Therefore, what is needed is to guide the practice of FLR in ways that adhere to the core principles that set FLR apart from the business-as-usual approaches that led to deforestation; land degradation; loss of livelihoods, food, and water insecurity; and marginalization of rural peoples. Many of the guidelines listed in Table 2 are useful for generating interest, consensus, and political and economic support for FLR, but they are missing essential criteria and indicators to operationalize the FLR principles (Figures 1 and 2).

Table 2 is a compilation of existing guidelines and documents focused on ecological restoration and FLR practices that bring actors closer to implementation and assessment by developing practical steps or roadmaps. Several documents focus on project-scale implementation as undertaken by external experts or specialists and fail to address the need for long-term ownership of FLR by local communities. Several guidelines specifically focused on FLR implementation do not even mention FLR principles, overlooking the very essence of FLR. Three documents are designed to complement the Restoration Opportunities Assessment Methodology (ROAM), a decision-support tool for initiating restoration planning at national and sub-national scales (IUCN/WRI 2014). ROAM is an important starting point, but is not intended for landscape-scale planning and does not provide criteria or indicators for FLR implementation within landscapes. New tools are needed that focus on inspiring, initiating, financing, and sustaining FLR within landscapes.

Table 2. Existing guidelines and best practices documents on forest restoration and FLR (since 2010).

Guidelines and Best Practices	Purpose and Intended Users	Relevance to FLR
Keenleyside, K., N. Dudley, S. Cairns, C. Hall, and S. Stolton. 2012. Ecological restoration for protected areas: principles, guidelines and best practices. 2831715334, IUCN, Switzerland. [81]	Used by protected area managers that implement ecological restoration	Ecological restoration enhances landscape connectivity, supports biodiversity conservation, and enhances resilience (Principles 1, 3, 4, and 6)
Pistorius, T., and L. Kiff. 2017. From a biodiversity perspective: risks, tradeoffs, and international guidance for forest landscape restoration. UNIQUE Forestry and Land Use GmbH, Freiburg, Germany. [82]	Analyzes the need and identifies potential options for mitigating biodiversity risks and trade-offs that are associated with implementing FLR at scale	Suggests that countries with FLR commitments define their own rules and modalities for implementation. No specific guidelines or frameworks are presented
Assessing the ITTO Guidelines for the Restoration, Management and Rehabilitation of Degraded Secondary Tropical Forests International Tropical Timber Organization (ITTO) consultancy with the World Resources Institute (WRI) 2015. Case studies of Ghana, Indonesia and Mexico (Kathleen Buckingham and Sarah Weber) [83]	Designed for policy planning and management; and stand-level principles and forest management. Have had limited use due to a lack of awareness by forestry managers, professionals and practitioners at different levels.	ITTO Guidelines and Principles are not yet adapted for FLR context, but links between FLR principles and ITTO 2002 guidelines are being strengthened.
Sustainable financing for forest and landscape restoration: Opportunities, challenges and the way forward. 2015. Discussion paper. (FAO and Global Mechanism of the UNCCD, Rome) [64]	This publication is oriented toward public policy makers and shares the experiences of some initiatives on financing FLR from around the world	The document provides background information on FLR and recommendations to help policy makers improve their support for FLR financing
Principles and practice of FLR: Case studies from the drylands of Latin America (Newton, A. C., and N. Tejedor, editors. 2011, IUCN, Gland, Switzerland) [84]	A compilation of case studies from an international research project, to examine application of the FLR approach to dryland forest ecosystems in Latin America	Developed conceptual frameworks for FLR based on DPSIR (Driving forces –Pressures–State–Impacts–Responses) framework based on European Environmental Agency
Implementing FLR, a practitioner’s guide. 2017 (Stanturf, J., S. Mansourian, and M. Kleine. 2017. International Union of Forest Research Organizations, Vienna, Austria) [24]	Intended as a training resource for FLR facilitators who have a broad approach to land management;	Project-focused guidelines designed primarily for external actors who are facilitating FLR; approach is based on FLR principles, but criteria and indicators are developed directly from project objectives
Voluntary Guidelines for FLR under AFR 100 https://afr100.org/content/voluntary-guidelines-forest-landscape-restoration-under-afr100	To provide guiding principles for the needs of decision-makers working in the African context and with AFR100 pledges	Emphasizes guiding principles for FLR; no explicit guidelines are presented beyond suggesting the ROAM process and FLR trainings.
AFR 100 Monitoring Guidelines https://afr100.org/sites/default/files/Monitoring%20Progress_English_Draft.pdf	To guide AFR100 partners to set up a national restoration monitoring system for FLR	Steps are described to guide a uniform and efficient approach to monitoring FLR using the FAO/WRI Restoration Goal Wheel and Relevant Indicators; FLR principles are not mentioned
FAO Global Guidelines for Dryland Restoration. 2015 (Berrahmouni, N., P. Regato, and M. Parfondry) Forestry Paper No. 175. Rome, Food and Agriculture Organization of the United Nations. [85]	A compilation of lessons from many experiences in dryland restoration worldwide. It is targeted at policymakers and other decision-makers, and dryland restoration practitioners	Useful guidelines are listed for policy makers, decision makers and practitioners that feed into FAO’s Monitoring and Reporting Tool for Forest and Landscape Restoration. Guidelines are not presented in a unified framework based on FLR principles.
Forest and Landscape Restoration Module; Sustainable Forest Management Toolbox (FAO; http://www.fao.org/sustainable-forest-management/toolbox/modules/forest-and-landscape-restoration/basic-knowledge/en/)	Intended for people involved in restoration of forest cover at landscape scale, including decision makers and practitioners. Provides links to tools and case studies.	Reviews technologies, institutional arrangements, and financial arrangements likely to be needed for implementation of FLR. Presents principles of FLR and basic steps of FLR implementation, but no specific guidelines.

Table 2. Cont.

Guidelines and Best Practices	Purpose and Intended Users	Relevance to FLR
Biodiversity Guidelines for FLR opportunities. 2018 (Beatty, C., N. Cox, and M. E. Kuzee, IUCN, Gland, Switzerland) [86]	The objective of this publication is to offer the FLR practitioner, the landscape restoration planner and the decision-maker guidelines for how to better integrate biodiversity knowledge and data into FLR opportunities and assessments	Biodiversity guidelines are best used in tandem with the Restoration Opportunities Assessment Methodology (ROAM); specific guidelines are not described in a working format
Scaling up Regreening: Six Steps to Success. A Practical Approach to Forest and Landscape Restoration. 2015. (Reij, C. and R. Winterbottom, World Resources Institute, Washington, D.C.) [73]	Offers a scaling strategy for regreening that is informed by experience of practitioners, communities, governments, and other key stakeholders	Six steps are based on practical experience and application of FLR principles, focused on regreening as a form of FLR practiced in drylands in Africa.
The Restoration Diagnostic: A Method for Developing Forest Landscape Restoration Strategies by Rapidly Assessing the Status of Key Success Factors. 2015. (Hansen, C., K. Buckingham, S. DeWitt, and L. Laestadius, World Resources Institute, Washington, D.C.) [87]	Designed to provide guidance to governments, civil society, and companies regarding how to implement FLR well on a large scale	A tool, based on case studies, to assess the status of three categories of key success factors: (1) motivation to catalyze FLR processes, (2) enabling conditions in place, and (3) capacity and resources for sustained implementation. Case studies are also presented.
Gender Responsive Restoration Guidelines (IUCN 2017) [88]	Designed for countries using ROAM to assess restoration opportunities	Present guidelines for the ROAM process for specific actions for identifying gender considerations and developing a gender-responsive approach and outcomes for FLR initiatives; FLR principles are not mentioned.
The Forest Landscape Restoration Handbook 2012 [89]	An edited book written by a team of experts to help forest restoration practitioners to understand FLR, appreciate its benefits and start implementation	Provides practical guidance on implementing FLR; two case studies presented. Emphasizes the “double filter” criterion of FLR: the joint objectives of enhanced ecological integrity and human well-being cannot be traded off against each other at a landscape level
4 Returns from Landscape Restoration (2015) Commonland Foundation) [90]	Design strategies to build bridges between farmers and local landowners, investors, companies and governments to promote long-lasting partnerships between stakeholders investing in large-scale landscape	A business approach to FLR based on four outcomes: return of inspiration, return of social capital, return of natural capital, and return of financial capital.
Mapping social landscapes: A guide to restoration opportunities mapping. 2018. (Buckingham, K., S. Ray, B. Arakwiye, A. G. Morales, R. Singh, D. Maneerattana, S. Wicaksono, and H. Chrysolite, World Resources Institute, Washington, DC.) [91]	The guide is designed to support policymakers, researchers, and those involved in restoration decision-making and implementation by offering a social landscapes assessment methodology for use in restoration efforts	Offers a guide to actionable, environmental-related strategies to build a social movement around restoration; supplements (ROAM) through its focus on social aspects.
International standards and principles for the practice of ecological restoration. Second Edition. 2019. https://doi.org/10.1111/rec.13035 [92]	A robust framework based on eight principles for ecological restoration projects to achieve intended goals, while addressing challenges including effective design and implementation, accounting for complex ecosystem dynamics (especially in the context of climate change), and navigating trade-offs associated with land management priorities and decisions	Does not focus on landscape approaches involving multiple types of interventions. Guidance focuses on achieving ecological restoration within a context of reference ecosystems.

Table 2. Cont.

Guidelines and Best Practices	Purpose and Intended Users	Relevance to FLR
Measuring progress in status of land under forest landscape restoration using abiotic and biotic indicators. 2018. Dudley, N., S. A. Bhagwat, J. Harris, S. Maginnis, J. G. Moreno, G. M. Mueller, S. Oldfield, and G. Walters. <i>Restoration Ecology</i> 26:5-12. [93]	The authors suggest a minimum set of abiotic and biotic threshold indicators and progress indicators if FLR, then also briefly discusses progress indicators of pressures and project outputs	Present a set of abiotic, biotic, and progress indicators for measuring changing conditions and the status of forest restoration and ecosystem services across a wider landscape. No indicators focus on social dimensions; no mention of FLR core principles.
Cohen-Shacham, E., Andrade, A., Dalton, J., Dudley, N., Jones, M., Kumar, C., Maginnis, S., Maynard, S., Nelson, C.R., Renaud, F.G., 2019. Core principles for successfully implementing and upscaling Nature-based Solutions. <i>Environmental Science & Policy</i> 98, 20-29. [7]	Presents definition and principles underpinning the Nature-based Solutions framework recently adopted by the International Union for Conservation of Nature	Compares eight NbS core principles to six FLR core principles.
FAO and WRI. 2019 The road to restoration: A guide to identifying priorities and indicators for monitoring forest and landscape restoration, FAO & World Resources Institute, Rome, Washington, D.C. p. 70. [94]	A practical guide to help governments, businesses, communities and anyone actively restoring land identify priorities and set up goals grounded in reality. The guide helps practitioners develop an indicator framework by identifying appropriate metrics and measures.	This guide is intended to be used at the landscape level but can be adapted to suit local needs and different scales. It is focused on project objectives, and is not based on FLR principles
Guidelines for Forest Landscape Restoration in the Tropics. 2020. International Tropical Timber Organization. https://www.itto.int/direct/topics/topics_pdf_download/topics_id=6423&no=1&disp=inline [23]	Developed using the FLR principles (Table 1) to provide guidance on the development and implementation of forest landscape restoration processes. The guidelines are linked fundamentally to the principles using a conceptual framework of guiding elements and recommended actions.	Well-developed guiding elements that provide an excellent basis for working frameworks discussed here. Introduces the idea of FLR scenarios and provides illustrative case studies for implementing FLR under certain broadly representative restoration scenarios.
Guariguata, M. R., Evans, K. 2019. A diagnostic for collaborative monitoring in forest landscape restoration. <i>Restoration Ecology</i> doi:10.1111/rec.13076 [95]	A checklist of core factors that contribute to successful collaborative monitoring in FLR at various scales.	The diagnostic explicitly addresses issues of scale, including multiple sites, governance levels, and changes over time and at different stages in the planning, implementation and evaluation of FLR interventions.

These documents further reveal the lack of clarity in the language of FLR guidance. Who is using the documents? Do guidelines motivate practical steps toward achieving FLR? Often, the holistic nature of FLR is overlooked in favor of achieving specific objectives and project goals that comfortably fit within existing organizational and government agendas. The latest GPFLR report recognizes that “Countries that have made ambitious commitments must receive more support in applying the principles of restoration to their own deforested and degraded lands. Stronger guidance, tools, and other support will help them to do that” [17]. We could not agree more.

5. Conclusions: The Manila Declaration and Next Steps

The Forest Restoration Standards Group (FLoRES) formed in September 2017 with the goal of engaging the FLR community in the development of quality standards for FLR. During an initial workshop organized by WeForest hosted by the University of São Paulo (USP) in Piracicaba, Brazil we discussed the need to operationalize the principles of FLR for practitioners, donors, and for all stakeholders and actors. We published a blog [96] and a brief [97], which was distributed and presented to the GPFLR and to other audiences at the Global Landscape Forum in Bonn in December 2017 in an effort to incorporate input from a wide group of landscape and restoration professionals, researchers, and practitioners. FLoRES held a second workshop in Nairobi, Kenya, hosted by the International Center for Agroforestry (ICRAF) following the Global Landscape Forum in August 2018. Many ideas from this workshop are presented in a second blog [98]. The idea of developing a set of FLR standards was put aside at the Nairobi workshop in favor of the development of an FLR framework with clearly defined working criteria for unfolding FLR processes and for identifying how and where FLR is taking place. Workshop participants strongly recognized the need to develop effective tools to be used at the landscape scale by different actors who seek to initiate an FLR process. We also strongly advocate co-creation of FLR strategies by local actors.

We have since taken the ideas of FLR frameworks a step further in this paper and discussed the architecture and construction of conceptual and working frameworks in a workshop in Tacloban, Leyte, Philippines on 22–23 February, 2019 [83] and during an international workshop on FLR held in Manila where the case studies in this special issue were presented [99]. An earlier version of this document was provided to all participants in advance as a whitepaper. Several key issues emerged from discussions at the workshop that led to the drafting of the Manila Declaration on Forest and Landscape Restoration, which was presented at the international conference [100]. The FLoRES taskforce hopes to continue working with entities around the world to fulfill the Manila Declaration and foster the development of conceptual and working frameworks that drive long-term and effective restoration systems around the world [49]. This paper provides a justification for developing comprehensive conceptual frameworks and stimulating co-development of tailored working frameworks. We hope that these efforts will be integrated with the development of international and national restoration agendas that are coalescing around the UN Decade of Ecosystem Restoration [101] and the platform for the Trillion Tree Community [102]. Ambitious aspirations need to guide practical steps and holistic activities to reverse the drivers of deforestation and environmental degradation and to improve the lives and livelihoods of all people. Given the current confluence of global health, climate, economic and environmental crises, now, more than ever, we need to ensure that our aspirations are guided by clarity and effective holistic responses that stand a chance to succeed.

Supplementary Materials: The following are available online at <http://www.mdpi.com/1999-4907/11/6/706/s1>, Table S1. Six steps to regreening (from [73]).

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