Co-creating Conceptual and Working Forest and Landscape Restoration Frameworks Based on Core Principles

A white paper for the Forest and Landscape Restoration Standards Taskforce (FLoRES)

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Restoration site in Bilaran, Philippines ©Chazdon

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OBJECTIVE

This whitepaper aims to stimulate the development of a high-level conceptual framework and linked tailored working frameworks to guide the initiation, practice and assessment of Forest and Landscape Restoration (FLR). Existing guidelines and best-practices documents do not satisfy, at present, the need for guidance based on core principles of FLR. Given the wide range of FLR practices and varied spectrum of actors involved, a single working framework is unlikely to be effective, but multiple 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 relevant 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 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. Finally, we describe existing FLR guidelines and what we can learn from them.

This whitepaper is a work in progress. The Forest and Landscape Restoration Standards task force (FLoRES) invites interested parties to work together with us to develop general and specialized working frameworks for moving FLR forward. Our goal is to incentivize and lead a process of engagement and co-creation rather than to deliver a fully developed set of FLR frameworks.

THE EMERGENCE OF FOREST AND LANDSCAPE RESTORATION

Forest and Landscape Restoration was proposed nearly 20 years ago (IISD 2002, Laestadius et al. 2015). 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 forest landscapes (Mansourian et al. 2005, Maginnis and Jackson 2007). 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” (Rietbergen-McCracken et al. 2007, p. 3). 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 or afforestation to create productive forests, the practice of FLR embraces a landscape approach (Sayer et al. 2013) to balance environmental and socio-economic needs in landscapes. FLR employs a mosaic of different types of land uses, restoration approaches and reforestation interventions to restore functions and sustainable use of land and forest resources, and to protect and enhance existing forest areas for biodiversity conservation (Appendix 1). How to achieve the “right” balance of land uses in a landscape involves a process of collective decision making, implementation, and adaptive management by stakeholder groups that live and work in the landscape.

As a practice, FLR acknowledges that local conditions and actions are shaped by landscape-level factors and that 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 (IISD 2002). The potential benefits of FLR extend beyond increasing tree cover to include: rural poverty alleviation, sustainably improve agriculture production, stabilization and diversification of local livelihoods and commercial opportunities, improved delivery and quality of ecosystem services, improved social justice and well-being, increased resilience to climate change, improved habitat connectivity, and enhanced biodiversity conservation (Sabogal et al. 2015).

Forest and Landscape Restoration is gaining momentum globally and has become an important international policy topic in the environmental sector (Pistorius and Kiff 2017). The Global Partnership on Forest and Landscape Restoration (GPFLR) was formed in 2003 to support and influence global policy and encourage national action (Van Oosten, 2009, Laestadius et al. 2015). FLR is widely viewed as a means toward reaching the United Nations Sustainable Development Goals, the National Determined Contribution of countries to the Paris Climate Agreement, the Convention on Biological Diversity's Aichi Biodiversity Targets, The New York Declaration on Forests, and the Bonn Challenge to bring 350 million ha of deforested and degraded land into restoration by 2030. Regional FLR-based initiatives are underway in Latin America, Africa, and Asia (Appanah et al. 2016, Reij and Garrity 2016, Meli et al. 2017).

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 update of FLR in many countries. Private investment in conservation and restoration is growing fast (Faruqi et al. 2018, GIIN 2018). From 2004 to 2015 over $8 billion of private capital was committed towards conservation and forest restoration to generate both financial return and environmental impact (Hamrick 2016). And collectively, the corporate sector continues to engage in carbon offsetting strategies linked to reforestation and conservation projects on the ground (Goldstein 2016).

But this promise may be empty if the FLR process fails to take hold on the ground and does not move restoration and reforestation practices beyond past business-as-usual approaches. Available funding for FLR is far below the estimated $350 billion needed (Ding et al. 2017). And, 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 (Mansourian et al. 2017). Some might say that FLR is at risk of becoming a global fad that could easily follow the fate of many past failed initiatives.

This work, along with other recent initiatives, is motivated to ensure that FLR does not become just another fad. Tools and guidelines to support aspects of FLR planning and implementation are proliferating (Chazdon and Guariguata 2018). Several countries are developing restoration

plans (Méndez-Toribio et al. 2017) and improving governance mechanisms in support of FLR practice (Schweizer et al. 2018). The Restoration Opportunities Assessment Methodology (ROAM) is being used in over 25 countries to develop capacity for implementing FLR at country or sub-country levels (IUCN 2017). 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). The International Union of Forest Research Organizations (IUFRO) published a guidance document for implementing FLR (Stanturf et al. 2017). The Food and Agriculture Organization of the United Nations (FAO) compiled a database of resources related to FLR, including monitoring resources. Global progress on the results and benefits of FLR is being assessed in terms of four indicators: the number of hectares under restoration, carbon sequestered, jobs created, and biodiversity benefits (Dave et al. 2017). And several recent research works have shown how spatial prioritization approaches can maximize FLR benefits and reduce implementation costs (Gourevitch et al. 2016, Molin et al. 2018, Strassburg et al. 2019). Are these actions sufficient to achieve the substance and scale that is needed?

In its latest formalization by the GPFLR, 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*" (Besseau et al. 2018, p. 18). Six *core principles* define the essence of FLR (Table 1) and represent the current shared understanding of members of the GPFLR, who are the global leaders of FLR policy and implementation. These principles provide a reasonable and stable foundation for developing working frameworks for implementation and assessment. The key to ensuring that FLR reaches its full potential to transform lives and landscapes is to create working guidance and implementation frameworks based on these core principles that are co-designed and used by different actors and stakeholders. The time has come to build FLR “structures” from the bottom up on a solid foundation of core principles.

Table 1. The six principles of FLR (based on Besseau et al. 2018)

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. It is at this scale that 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.

CHALLENGES FOR IMPLEMENTING FLR AND ACHIEVING LONG-TERM OUTCOMES

Despite its 20-yr conceptual history and recent wide adoption in the language of global restoration initiatives, the reality is that FLR has so far failed to achieve its transformative goals in practice. One main reason is that FLR is inherently multidimensional, incorporating biophysical, socioeconomic and governance dimensions that are difficult to integrate when assessing outcomes of a given intervention at the landscape scale, a process that is often driven by teams that lack multidisciplinary training or capacity. These challenges must be recognized and addressed before the world can benefit from the full potential of FLR as an approach for large-scale restoration. They fall into four main categories: (1) defining FLR interventions and outcomes; (2) institutional and governance challenges; (3) financing challenges; and (4) technical challenges.

CHALLENGES IN DEFINING 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 and 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" (Sayer et al. 2007, p. 2679). Others prefer to use the term *territory*, which refers to spatial units that are delimited by ownership, responsibility, entitlements, and governance of forest space (McCall 2016). 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.

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 full spectrum of ecosystem services or enhance local biodiversity (Brancalion and Chazdon 2017). 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. This makes 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 would help in identifying the footprint and performance of FLR interventions on the ground. 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. But it can also lead to "cherry-picking" certain actions and neglecting others. FLR implies different things to different people. Mansourian (2018) describes five different constructs for FLR, and Erbaugh and Oldekop (2018) 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 (Mansourian et al. 2017). Vagueness can also become crippling because there are no basic rules or norms to follow (Mansourian 2018).

Existing voluntary guidelines (Table 2) do not focus on how to measure holistic outcomes specific to FLR that reflect the underlying principles that distinguish FLR from its antecedents in policy and practice. 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 (Evans et al. 2018) and could mislead practitioners and stakeholders into thinking 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. Integrated landscape approaches, including FLR, face many institutional and governance barriers, and their effectiveness has not been adequately demonstrated (Reed et al. 2016). Reed et al. (2017) failed to find a single reported case of landscape approaches (see Sayer et al. 2013) 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, particularly from international NGOs. Beyond their value in providing inspiration, case studies 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.

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. 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.

Local leadership, trust, and social cohesion are critically important ingredients of representative and long-lasting FLR. In addition to the role of impassioned and charismatic individuals (including religious leaders), 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 adaptations in local governance and power structures.

FLR is a multi-stakeholder-based process (Boedhihartono and Sayer 2012). When local stakeholders are not fully engaged throughout the FLR processes, the likelihood of long-term success greatly diminishes. It is also necessary for stakeholder representation to be meaningful and to minimize power imbalances that can occur regardless of insider or outsider project initiation. Although rapid implementation of 3- to 5-year projects may be necessary for demonstrating progress and reporting to funding agencies, externally initiated, governed, and financed interventions do not fulfill FLR principles if they fail to recognize and act on the need for local empowerment and governance of the FLR process. Local agency and sustained involvement are fundamental to co-create a long-term pathway that develops on the ground and transforms lives for the better.

CHALLENGES IN FINANCING FLR

Few business models exist for holistic FLR implementation (FAO and UNCCD 2015, Ding et al. 2017). Investors increasingly view FLR as options for impact investment based on a bottom line favoring commercial production and profits, which will not provide an adequate balance of benefits for local people (Brancalion et al. 2017). Similarly, companies investing in carbon insetting[1] 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 (Tipper et al. 2010). Whereas NGOs hold different models of funding (Gutierrez and Keijzer 2015), there is a growing need for NGOs to seek out innovative finance. FLR initiatives that rely on both impact investment or insetting will need to educate investors on the need to look beyond commercial activities to fully implement FLR processes. The large donors and funders that support FLR tend to overlook the details and consequences of what happens on the ground or do not require any historical baseline to assess the direct consequences of interventions. This lack of accountability discourages the need to clarify how FLR interventions depart from sectorial or business-as-usual approaches.

The time scale for unfolding of FLR outcomes poorly matches time scales of funding and program/project cycles. FLR is 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 often incompatible with implementation for long-term impacts (Hodge and Adams 2016). Funding and expertise as

[1] "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" (Tipper et al. 2010, p.3).

well as political will are often not available to sustain monitoring efforts for long enough to detect impacts, facilitate learning, and improve frameworks and processes (Sayer et al. 2017).

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 in landscapes (Chazdon and Guariguata 2018). Local stakeholders with expertise in an area may lack the full range of skills and technical knowledge needed for the task. Practitioners have no 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 agencies and organizations have no understanding of how to implement restoration using non-traditional reforestation approaches, which are mostly based on monoculture tree plantations of exotic species (Chazdon et al. 2017).

Unleashing the potential for FLR may also require developing the capacity for different stakeholder groups to work together with different agencies and institutions. The collaborative use of decision-support tools and development of scenarios, maps, and restoration plans can help to engage different groups in this process.

THE NEED FOR WORKING FLR FRAMEWORKS BASED ON A SHARED CONCEPTUAL FRAMEWORK

It is clear from the previous section 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, as the FLR process requires unpacking multiple components and their interrelations. The FLR process unfolds over time and often requires changing or eliminating entrenched prior practices. A path towards achieving FLR is needed. There are 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 (2015) outlined such a strategy in their presentation of six steps to scale up regreening in the West African Sahel (Appendix 2). 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. 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) 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.

Guidelines help to identify and explain quality issues and to provide strategies for dealing with them, such as biodiversity conservation, social safeguards, cost-effectiveness of interventions, and stakeholder engagement. Whereas guidelines emphasize, clarify, or reiterate the core principles of FLR, they often lack working and practical criteria for adoption, enforcement, monitoring and evaluation. Further steps are needed to provide clear norms for acceptability of interventions and outcomes as representing the full scope and intention of FLR.

The key to making FLR happen lies in unfolding a process within landscapes that fulfills the core principles (Table 1). This implies that while all FLR processes are distinct, all share the core defining elements of FLR. A conceptual and overarching FLR framework could lay out the higher-level architecture on which to ground FLR processes and provides a common thread unifying actions on the ground. Such a framework can be adapted and contextualized by FLR implementers, avoiding having to reinvent the wheel.

The understanding and implementation of a multidimensional and interdependent 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 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.

Currently, there is a dearth of tools to guide interventions undertaken in the name of FLR and to assess their outcomes to ensure they are based on a landscape focus; restore multiple environmental, social and economic functions across a landscape that benefit multiple stakeholder groups; have strong stakeholder engagement; are tailored to local social and environmental context; and rely on adaptive management to respond to changing conditions, unpredictable events, or failed outcomes (Table 1). Assessment frameworks that are not firmly ground in the core principles may lead to perverse outcomes that run counter to the objectives of FLR. For example, monitoring frameworks for landscape-scale restoration projects implemented to enhance carbon storage may overlook negative impacts of interventions on local livelihoods, public health, food security, or local biodiversity (Brancalion and Chazdon 2017).

Guidance frameworks for the implementation and assessment of restoration work exist (Table 2), but these have not been useful in the context of FLR. For example, McDonald et al. (2016) published the Society for Ecological Restoration's international standards, which were heavily based on national standards developed for Australia (McDonald et al. 2016). This performance-based standard assesses progress based on six key attributes that indicate the status of ecosystem recovery. Such a standard is not applicable to FLR because it is rooted in ecological restoration approaches, and does not incorporate landscape principles or social dimensions. 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 assessing adherence to the core principles.

PRINCIPLE, CRITERIA, AND INDICATOR FRAMEWORKS

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. Integrating the FLR principles improves the understanding of the systems that we aim to change. We advocate taking account of the driving forces underpinning landscape dynamics in the development of practical frameworks that will be widely used to improve the long-term chances of FLR success from the perspective of different stakeholders.

A widely accepted and adopted manner for operationalize a set of principles is through a Criteria and Indicators (C&I) Framework (Prabhu et al. 1996; 1997). Typical principles, criteria, and indicator (PCI) frameworks are hierarchical and linear, such that individual principles directly correspond to a set of related criteria and indicators. But 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 could adopt a network-based architecture since it more closely represents the complexity of the FLR process; it manifests the interconnections across principles and criteria; and highlights the non-linear relationships among landscape elements.

Working Frameworks

A guidance and assessment framework for FLR could be used to assess progress using indicators that measure adherence to principles rather than solely focusing on performance metrics. These working frameworks (also called operational or practical frameworks) must 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 (Brancalion et al. 2016). There is no system of norms or standards for assessing FLR progress, and it is unlikely that a single system would be appropriate 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 PCI framework for FLR could also take the form of a network diagram rather than a table (Figure 1). In this example, derived from on a table by Salazar et al. (2005), three principles are used to develop a criteria and indicator framework for assessing FLR in Hojancha County, Costa Rica. The Indicators shaded in purple describe the status of ecosystem services that are linked to both criterion 1.1 and criterion 2.1, which emerge from two different principles. The indicator shaded in blue-green, *economic compensation of landowners*, links to both criterion 2.2 (fair distribution of benefits) and criterion 3.1 (national policies).

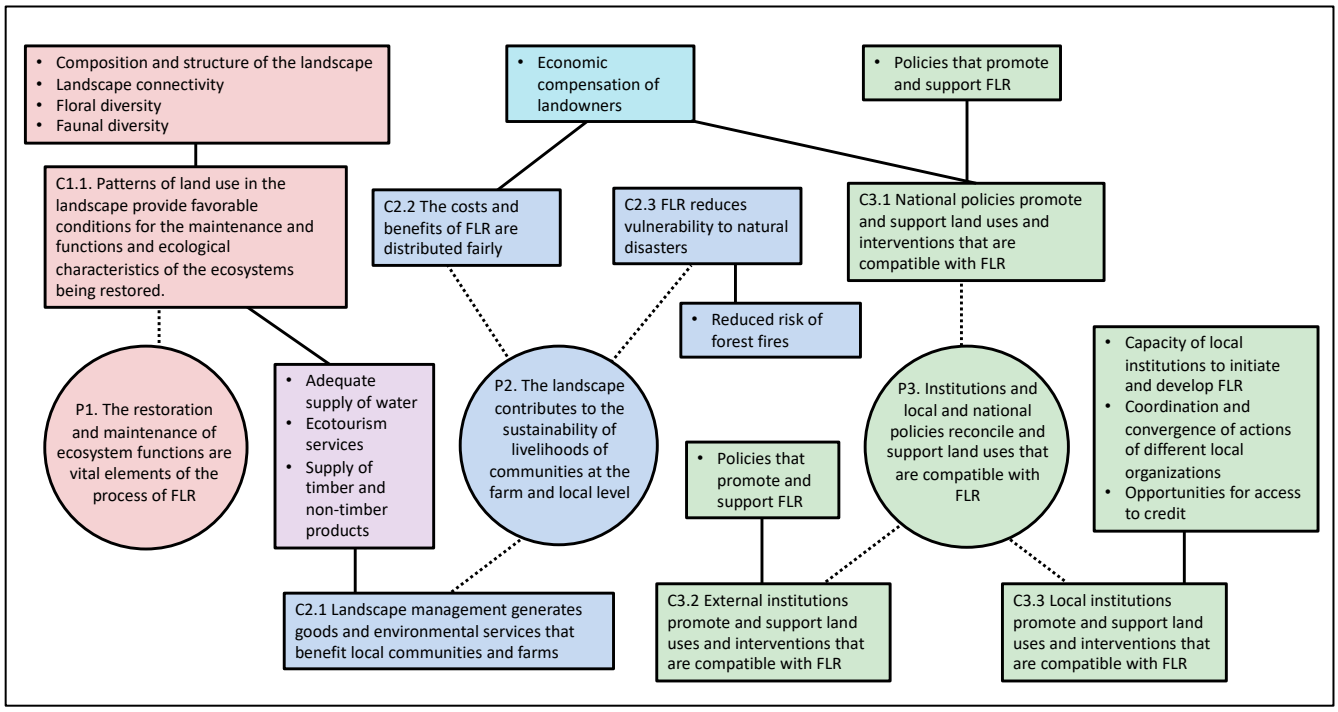

Figure 1. A working PCI framework for the evaluation of forest and landscape restoration in Hojancha, Costa Rica based on Salazar et al. (2005). Three color-coded principles are shown in circles and associated criteria are in boxes. Indicators are in bullets. Some indicators are enabling factors, some are outcomes, and some are processes.

At the landscape level, a network diagram approach highlights how particular criteria 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. In the example in Figure 1, the three principles do not capture the complete essence of the six core FLR principles. But had a conceptual framework existed, developing a working framework for the Hojancha FLR process would have been easier to accomplish.

Active involvement or co-creation of FLR frameworks achieves many goals. Actors become empowered to understand how FLR 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 actors become owners, designers, and stakeholders of the FLR process as it unfolds in their own landscape.

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 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.

HOW DIFFERENT ACTORS CAN ENGAGE WITH THE FRAMEWORK

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. These different actors may benefit from developing and applying specialized types of working frameworks and guidelines that are derived from the a higher-level conceptual FLR framework.

- From the perspective of local landowners, land managers, and communities that seek to practice FLR or enhance existing community-based restoration and reforestation, how can they co-create a strategy to unfold FLR over time within their landscape, and how can they assess and guide their progress? Here, a toolkit can provide help to these groups to define the boundaries of their landscape, to map the baseline features, to guide the selection and locations of initial interventions, to form appropriate institutional arrangements, and to chart a FLR pathway or strategy that add components and criteria over time using adaptive management approaches.
- For local, regional, and national governments, how can they best reach their country-level restoration commitments and targets while fulfilling FLR core principles? These actors can use the conceptual framework to develop their FLR frameworks, to optimize

spatial locations for different interventions within landscapes, to assess the level of stakeholder engagement, and to assess a set of social and environmental indicators to track outcomes and apply adaptive management.

- For non-governmental organizations that work to improve livelihoods or enhance biodiversity conservation through implementing and supporting FLR interventions on a project basis, how can they be assured that the work they do follows FLR's guiding principles and serves to generate a long-term FLR process in landscapes? These organizations may wish to promote interventions that are directly linked to livelihood improvement, more effective governance, or to biodiversity conservation and would initially emphasize these aspects.
- For funding agencies, impact investors and donors, financial viability, impact, accountability and transparency are essential, and project selection criteria must ensure that core principles and values are upheld to reduce the risk of investments. How can these funders be assured that the actions and outcomes proposed or undertaken in the name of FLR actually conform to the core principles? These entities may wish to advocate for criteria and indicators that emphasize stakeholder engagement, landscape-level scope and approach, economic and financial viability and profits, transparency of interventions and costs, and effective monitoring of social and environmental outcomes.

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 conform with the core principles of FLR? Implementing FLR interventions needs to be truly effective, 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. But in practice, deliberate steps need to be taken to ensure that these broad aims are achieved.

Working FLR frameworks could be used by implementers 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 will gain many social, environmental, economic, finance, and management benefits by co-creating and applying working FLR frameworks (Figure 2). 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 will be generated from restoration implementation and sustainable management of natural resources. These frameworks will consider criteria and indicators for the fair distribution of economic benefits, for resolution of conflicts, and guide stakeholders as they take part in FLR implementation. 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.

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 frameworks are tools to promote economic development and stability in landscapes and reduce economic inequalities among different stakeholder groups. From a management perspective, a FLR framework will encourage more effective monitoring and assessment, promote the legitimacy of interventions, and provide a mechanism for scaling up of successful landscape models.

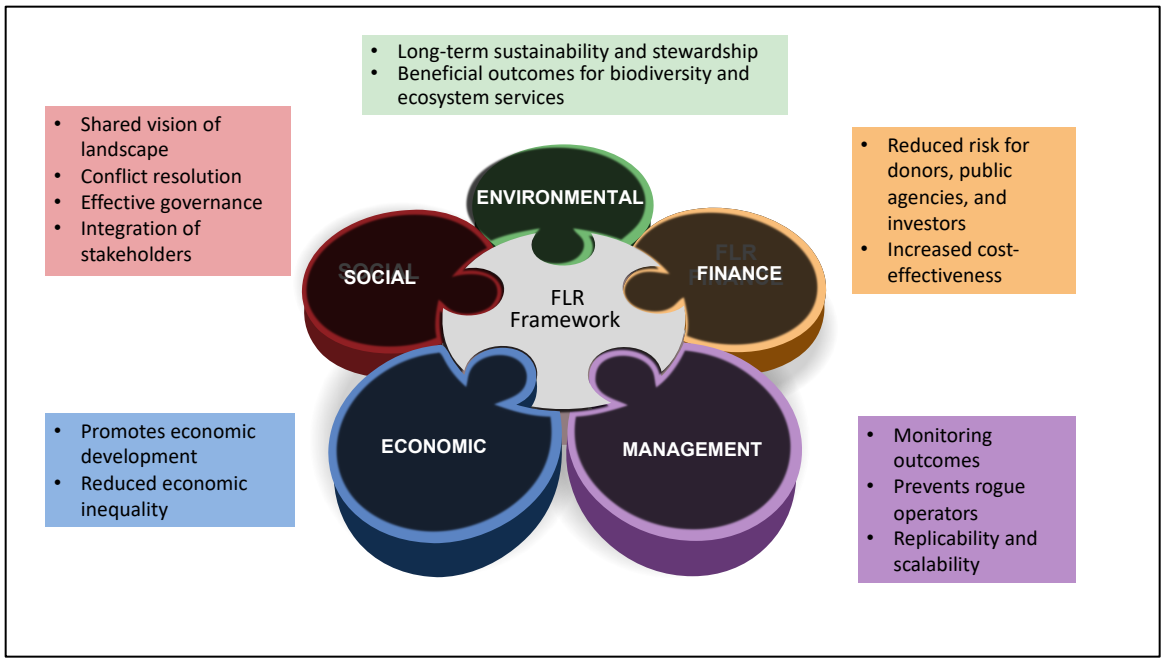

Figure 2. The many benefits of developing and applying FLR working frameworks based on core principles.

In summary, across the spectrum of FLR actors, there is much to gain from developing and applying working FLR frameworks that provide roadmaps for how to operationalize the FLR principles and ensure their long-lasting outcomes.

WHAT CAN WE LEARN FROM EXISTING FLR GUIDELINES

As FLR is a voluntary activity, enforcement and mandates of specific actions are not needed. Rather, 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. Guidelines 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 (Figure 1).

Table 2 is a compilation of existing guidelines and documents focused on restoration practices and FLR practices. This compilation reveals an urgent need for tools and frameworks for developing practical steps or roadmaps to bring actors closer to implementation and assessment. 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.

These documents further reveal the lack of clarity in the language of FLR guidance. Who is using the documents and 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. A recent 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" (Besseau et al. 2018). We couldn't agree more.

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.	Used by protected area managers that implement ecological restoration	Ecological restoration enhances landscape connectivity, supports biodiversity conservation, and enhances resilience (Principles 1, 3, 4, 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.	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)	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).	This publication is oriented toward public policy makers and shares the experiences of some initiatives	The document provides background information on FLR and recommendations to help policy

	on financing FLR from around the world	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)	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)	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 (no date or authors provided)	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 (no date or authors provided)	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.	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.
Biodiversity Guidelines for FLR opportunities. 2018 (Beatty, C., N. Cox, and M. E. Kuzee, IUCN, Gland, Switzerland)	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. 2016. (Reij, C. and R. Winterbottom, World Resources Institute, Washington, D.C.).	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. Buckinghman, S. DeWitt, and L. Laestadius, World Resources Institute, Washington, D.C.)	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)	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 (Rietberg en et al. 2012)	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 (2017 Commonland Foundation)	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	An investment approach to FLR based on four principles: 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.)	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.
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. Restoration Ecology 26:5-12.	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

		indictors focus on social dimensions; no mention of FLR core principles.
Measuring Progress for Forest and Landscape Restoration Working Paper Version 1.0 (FAO/WRI monitoring framework (Kathleen Buckingham, Sabin Ray, Fred Stolle, and Faustine Zoveda)	Intended to inform national-level restoration and landscape-level restoration practitioners who are working to implement restoration on the ground	A tool (Restoration Goal Wheel and Relevant Indicators to facilitate monitoring) to select core indicators (biophysical, social, financial, and governance indicators) based on project objectives; not based on FLR principles

THE FLORES TASKFORCE AND NEXT STEPS

The Forest Restoration Standards Group (FLoRES) formed in September 2017 to engage the FLR community in the development of quality standards for FLR. During an initial workshop organized by WeForest at the University of Sao Paolo (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 and composed a brief that 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, researches, 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 came out of this workshop that are presented in a second blog. The idea of developing FLR standards was put aside at the Nairobi workshop in favour 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 participates 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 FLR framework a step further in this white paper and will be discussing the architecture and construction of conceptual and working frameworks in an upcoming workshop in Tacloban, Leyte, Philippines on 22-23 February, 2019. This white paper serves as a background document for workshop participants and other interested parties who are not able to attend the workshop.

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Appendix 1. The FLR Options framework. Different types and sub-types of land use can be implemented to achieve Forest and Landscape Restoration. From: IUCN & WRI (2014, p. 39)

Land use	Land sub-type	General category of FLR option		Description
Forest land Land where forest is, or is planned to become the dominant land use > Suitable for wide-scale restoration	If the land is without trees, there are two options:	1. Planted forests and woodlots		Planting of trees on formerly forested land. Native species or exotics and for various purposes, fuelwood, timber, building, poles, fruit production, etc.
		2. Natural regeneration		Natural regeneration of formerly forested land. Often the site is highly degraded and no longer able to fulfil its past function – e.g. agriculture. If the site is heavily degraded and no longer has seed sources, some planting will probably be required.
	If the land is degraded forests:	3. Silviculture		Enhancement of existing forests and woodlands of diminished quality and stocking, e.g., by reducing fire and grazing and by liberation thinning, enrichment planting etc.
Agricultural land Land which is being managed to produce food > Suitable for mosaic restoration	If the land is under permanent management:	4. Agroforestry		Establishment and management of trees on active agricultural land (under shifting agriculture), either through planting or regeneration, to improve crop productivity, provide dry season fodder, increase soil fertility, enhance water retention, etc.
	If it is under intermittent management:	5. Improved fallow		Establishment and management of trees on fallow agricultural land to improve productivity, e.g. through fire control, extending the fallow period, etc., with the knowledge and intention that eventually this land will revert back to active agriculture.
Protective land and buffers Land that is vulnerable to, or critical in safeguarding against, catastrophic events > Suitable for mangrove restoration, watershed protection and erosion control	If degraded mangrove:	6. Mangrove restoration		Establishment or enhancement of mangroves along coastal areas and in estuaries.
	If other protective land or buffer:	7. Watershed protection and erosion control		Establishment and enhancement of forests on very steep sloping land, along water courses, in areas that naturally flood and around critical water bodies.

Appendix 2. Six steps to regreening (from Reij and Winterbottom 2015)

1. Identify and analyze existing regreening successes
2. Build a grassroots movement for regreening and mobilize partner organizations
3. Address policy and legal issues and improve the enabling conditions for regreening
4. Develop and implement a communication strategy to systematically expand the use of all types of media
5. Develop or strengthen agroforestry value chains to enable farmers to capitalize on the role of the market in scaling up
6. Expand research activities to fill gaps in knowledge