# Forest Landscape Restoration (FLR) in Central Africa

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*Photo by Philippe Guizol*

# Introduction

> The aim of this chapter is to take stock of forest landscape restoration in Central Africa. First, we clarify the concept of landscape restoration. Second, we present some cases illustrative of forest landscape restoration in Central Africa. Finally, we cover the question of governance and then offer some conclusions.

# 12.1 Degradation and restoration of forest ecosystems in Central Africa

Views on forest landscape restoration (FLR) often differ. Ecological rehabilitation, which seeks to restore pre-existing ecosystems in terms of specific compositions and community structures, is not always feasible. FLR works differently, to reconstitute certain ecosystem functions in order to improve the well-being of the people who live or will live in those landscapes. In this way, FLR also contributes to climate-change adaptation and mitigation and to biodiversity conservation. These two forms of response to forest ecosystem degradation can be combined in local or regional landscape planning.

## 12.1.1 Clarifying the FLR concept

FLR is a long-term process that seeks to limit continued degradation of existing forest ecosystems and/or to repair them (i.e., forest rehabilitation), so as to sustainably improve the living environment of local people[1]. Reducing forest degradation involves changing the rules of interaction between natural and social dynamics (e.g., patterns of resource appropriation). FLR may, of course, include forest rehabilitation actions, such as plantations, assisted natural regeneration, or water and soil management (e.g., terraces, anti-erosion ditches, mulching, soil conditioning) on areas that are individually owned or common property, but it cannot be reduced to and confused with these actions. FLR is a long-term and changing process that involves adaptations to social, demographic or institutional change, or to change in stakeholder perception or environmental conditions. It requires shared vision at various levels, co-construction with stakeholders, and monitoring systems. FLR should be part of local land use planning via a decision-making process, and this latter must precede the setting out of its objectives and methods of action. This decision-making process determines the framework for the long-term restoration of the ecosystems in question.

Landscape restoration is therefore not limited to planting projects, and – given societal demands – it is very rarely a return to the original ecosystems.

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1   https://www.decadeonrestoration.org/strategy

## 12.1.2   From the Bonn Challenge to the Decade for Ecosystem Restoration

Landscape and forest restoration has become one of the leading activities of climate-change mitigation. The "Bonn Challenge" was initially a global effort to reforest degraded or deforested land. Its original goal to restore 150 million ha between 2011 and 2020 has gradually evolved to 350 million ha by 2030, including 100 million ha in Africa. This initiative should generate a net benefit of USD 170 billion per year stemming from FLR, as well as provide an ecological benefit by helping to stock 1.7 gigatonnes of $CO_2$ equivalent annually. Significant environmental services are also expected.

FLR contributes to the Bonn Challenge and the New York Declaration on Forests, with the goals of protecting biological diversity and ensuring food security and human subsistence conditions. The African version of the initiative (AFR100) was officially launched during COP21 in Paris, in December 2015. AFR100 also acts as a contribution to the African Resilient Landscapes Initiative (ARLI), the Sustainable Development Goals (SDGs) and other programmes such as the Bonn Challenge. Several African countries are involved in the AFR100 process. The target of 100 million ha has been largely exceeded, with commitments having been made to restore 108 million ha by 2030. This landscape restoration effort is being supported in particular by Germany, Norway, the International Union for Conservation of Nature (IUCN) and the World Resources Institute (WRI), in collaboration with the Global Partnership on Forest and Landscape Restoration (GPFLR).

More recently, the UN Decade on Ecosystem Restoration, which seeks to scale up the restoration of all ecosystems globally, started in 2021 and is expected to end in 2030. It has a clear objective of reversing the degradation of ecosystems whatever their nature: forests, croplands, wetlands or savannas. This initiative started with a proposal from El Salvador in March 2019. It has been adopted by more than 70 countries and reinforces the Bonn Challenge. Its implementation will require (i) setting clear and measurable objectives, involving as many people as possible; (ii) listening to the stakeholders on the ground; and above all (iii) mobilizing investments commensurate with the challenges. For example, restoring 350 million ha requires at least USD 1 trillion.[2]

**Table 12.1: Commitments of some COMIFAC countries at AFR100 (note: not all COMIFAC countries have committed to restoring their landscapes)**

|  | Commitments to AFR100 in million ha | Area of the country in million ha | % of landscapes to be restored in relation to area of the country |
|---|---|---|---|
| Burundi | 2.0 | 2.8 | 72% |
| Cameroon | 12.0 | 47.5 | 25% |
| Rep. of Congo | 2.0 | 34.2 | 6% |
| CAR | 3.5 | 62.3 | 6% |
| DRC | 8.0 | 234.5 | 3% |
| Rwanda | 2.0 | 2.6 | 76% |
| Chad | 1.4 | 128.4 | 1% |
| Totals | 30.9 | 512.4 | 6% |

Source: https://afr100.org/content/countries

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2   https://wedocs.unep.org/bitstream/handle/20.500.11822/30919/UNDecade.pdf

At its 9th Ordinary Session in November 2016 in Kigali, Rwanda, the COMIFAC Council of Ministers gave its support to the AFR100 process. This should help COMIFAC countries to meet their commitments to reverse the trend of forest and land degradation, by restoring 15 percent of degraded forests by 2020 and 25 percent by 2025 in Central Africa (COMIFAC 2014).

## 12.1.3 Process to determine landscape restoration objectives

At the national and subnational levels, there are methods to determine the general framework and objectives of FLR (see the case of the CAR below). At the local level, a very different approach is needed to ensure that local populations are fully involved in the decision-making process. Indeed, it is important that they themselves determine how their living environment and habits will be transformed with the purpose of restoring, over the long term, the landscapes that provide them with the renewable resources and ecosystem services on which they depend. Linkage between the top-down decision-making process of the national framework and the bottom-up process from the local populations is critical and probably unique to each country, when it exists.

The FLR process involves a multistakeholder dimension at the local level and requires the establishment of a consultation strategy which seeks to empower each category of stakeholders. This, in turn, should motivate their involvement in the various stages. Women's contribution to knowledge is crucial and must be equal to that of men, as they are most often excluded from decision-making processes.

## 12.1.4 Evolution and causes of degradation in Central Africa

The processes of degradation are often a precursor to deforestation (Vancutsem et al. 2021). In Central Africa, when forest tracks are opened, it enables the local population to clear the forest for growing crops. The multiplication in the number of these fields increases along with population growth, leading to complete deforestation, when logging alone would not have caused it. These processes are not inevitable: they are due to an institutional and governance situation that is unable to control the activities that generate forest degradation. In other words, it is not so much logging, roads and tracks which cause deforestation as the lack of suitable institutions to control and limit the various processes of degradation.

The Central Africa region had long seemed spared by forest degradation (Tchatchou et al. 2015), especially compared to other large tropical forest basins in Brazil and Indonesia. But today acceleration of degradation and deforestation in the regions is observed, by both the JRC[3] (Vancutsem et al. 2021) and by Global Forest Change.

Given the increasing degradation of forest ecosystems in Central Africa, it is essential that landscape restoration incorporate measures to slow it down. In line with countries' commitments, the challenge is to find trade-offs that allow the people who live there to produce the goods they need (e.g., food, wood and energy), all the while maintaining the forest ecosystems that ensure the sustainability of agronomic systems and provide other ecosystem services (see Chapter 7).

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3    JRC: the Joint Research Centre, an internal scientific service of the European Commission.

**Table 12.2: Average annual losses in Central Africa of undisturbed tropical rainforests, in million ha, due to degradation (followed or not by deforestation), 1990 to 2020, over 5-year intervals**

| 1990-1994 | 1995-1999 | 2000-2004 | 2005-2009 | 2010-2014 | 2015-2019 |
|-----------|-----------|-----------|-----------|-----------|-----------|
| 0.28 | 0.83 | 0.4 | 0.91 | 0.92 | 1.24 |

Source: Vancutsem et al 2021

Slash-and-burn and subsistence agriculture are the leading cause of forest cover loss in the Central African humid zone (GFW).[4] Around cities, in areas of high population density, or along roads, slash-and-burn practices used by elders are no longer a sustainable system of agriculture, but a major cause of degradation and deforestation. In the past, these practices led to small clearings within large forest areas. The fallow system at the time was long and thus viable, as it allowed return to secondary forests. Today, that system is characterized by a process of degradation, with increasingly short fallow periods and made worse by the excessive use of fires, this latter being the main tool of a precarious peasant population with limited options. Uncertainties about land rights leave these people with no choice but to assert these rights by means of axe and chainsaw.

The main causes of degradation in the driest areas are exploitation of firewood, excessive use of pastoral fires and the roaming of livestock. Other causes that can have a significant local impact include agro-industries, mining (which is often informal) and refugee camps. These can lead to significant local degradation of ecosystems and even to definite deforestation.

There are also indirect causes. For example, land and forest management is linked to the institutional framework specific to each territory and each country. These institutions are based on perceptions of the state of forest resources and land. With the exception of countries such as Rwanda and Burundi, there is a widely shared perception in Central Africa that there are abundant forest resources and land (abundance theory). As a result, forestry policies have focused on *developing*, i.e., exploiting natural resources rather than investing in their long-term management. These policies have thus created conflicts either with local populations due to lack of participation or transparency, or between government agencies due to lack of coordination. Finally, rural populations, within existing institutional frameworks, also often have the same approach: exploiting to develop and appropriate space, by destroying the existing ecosystem, according to the rights of clearance.

Other indirect causes of forest degradation stem from inconsistencies in international public policies. Many efforts were made in the 1970s and 1980s to develop forest plantations. Such efforts could have alleviated the pressure logging causes in natural forests today, but they were abandoned in the 1990s because of structural adjustments. A whole body of technical knowledge was lost this way, even though major forest rehabilitation programmes are being considered today.

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4    https://www.globalforestwatch.org (see dashboard for Cameroon or the DRC, for example)

## 12.2 FLR in several countries of Central Africa

### 12.2.1 Cameroon: FLR a concept still in its start-up phase

Desertification as well as land and landscape degradation are a long-standing concern in Cameroon. In response, Cameroon undertook to deal with these issues and that of drought for the northern part of the country, even prior to the implementation of the main guidelines of the 1992 Rio Summit, which enshrined the major conventions (United Nations Framework Convention on Climate Change - UNFCCC, United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification - UNCCD, Convention on Biological Diversity - CBD, etc.). In 1975, for example, it set up a provincial committee for drought control in the north of the country. This organization started the actions to combat desertification and drought via the initial phase of Operation Green Sahel. This programme promoted mass reforestation to respond to the degradation of the environment.

To comply with its commitments to the UNCCD, Cameroon produced the National Action Plan to Combat Desertification (NAP/LCD) in 2006. This plan relaunched Operation Green Sahel, which incorporates the new guidelines of the Convention. Later, to cope with land degradation on cotton-growing areas in the old cotton basin of North Cameroon, a plot-based land restoration system was set up to develop soil fertility preservation habits among cotton producers. An analysis of the second progress report on the Bonn Challenge states that, from 2004 to 2017, reforestation actions in Cameroon were carried out on an estimated 2 million ha of degraded lands.[5]

Within the framework of the Bonn Challenge and AFR100, Cameroon has undertaken to restore 12 million ha. As part of this approach, and following several consultations with the partners involved in the process, out of 10 projects under development, two major projects co-signed by the MINEPDED and the MINFOF were programmed for implementation in 2021. The first, the Large-scale Forest Landscape Restoration in Africa project, aims at the large-scale restoration of forest landscapes. In Cameroon, it is funded through the IKI initiative by the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU). The second is a programme made up of several projects, each with different forms of implementation depending on the stakeholders involved (public and private stakeholders, Decentralized Territorial Community, NGOs).

Cameroon has also undertaken to implement the Great Green Wall, whose new approach advocated by the African Union is to involve countries that did not directly participate in the launch of the initiative. As early as 2015, Cameroon took action along with the UNCCD to promote the concept of "land degradation neutrality (LDN)," which has been defined as *a state in which the amount and quality of land resources necessary (i) to support ecosystem functions and services and (ii) to enhance food security remains stable or increases within specified temporal and spatial scales and ecosystems."* Cameroon has proposed its programme to determine national land degradation neutrality targets; it aims to improve land productivity by at least 10 percent nationwide and by 90 percent in municipalities located in priority areas for fighting land degradation.

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5    https://portals.iucn.org/library/sites/library/files/documents/2019-018-En.pdf

The National Plantation Forests Development Programme (NPFDP), validated in 2019 by the forest administration and development partners, could be the basis for the rehabilitation of degraded landscapes and forests in Cameroon. The National Forestry Development Agency (ANAFOR) is responsible for directly or indirectly supporting the implementation of the said programme. To do so, it carries out studies, looks for financing, provides seeds and seedlings and develops consulting expertise. Even though financial support is not yet available, this programme offers the opportunity to reconcile restoration actions using a landscape approach, with the involvement of local populations via decentralized local authorities. Under this programme, the main objective of ANAFOR is to facilitate the planning, establishment and development of private and community forest plantations, the development of value chains, and a sustainable forestry economy generating jobs and growth.

Research objectives have been determined in order to capitalize on and improve the contribution of research to the development of FLR actions. The programme has made it possible to identify various fields of research including both the enhancement of local knowledge and the development of procedures for tracking the socioeconomic impacts of FLR. However, research in Cameroon continues to suffer from a lack of resources to meet all these challenges.

The current orientations for financing FLR are identified through two sources, the Cameroon Public Investment Budget and external aid. The Public Investment Budget coming from the government ministries is mainly allocated to the rural sector (MINEPDED, MINFOF, MINADER, MINEPIA, etc.). Depending on their relevance, the actions are included in the operational programmes or made to be part of a project.

External resources via bilateral or multilateral cooperation can focus on FLR actions, or they may approach FLR from related issues (resilience of family farming, decentralization, management of permanent or non-permanent forests, innovations in agriculture, green cocoa farming, biodiversity protection, etc.). However, as indicated in the FLR Strategic Framework, there is a need to diversify the sources of support for FLR funding.

In short, the rehabilitation of landscapes in Cameroon has given rise to quite a number of strategy papers, and many past and current reforestation projects – which can by default be assimilated to landscape restoration actions – have been implemented in various regions of the country. These projects make up a body of experiences that could help facilitate implementation of FLR in the country. Finally, the personnel involved in FLR in Cameroon have participated in conferences and exchanges of experience, which represents still another asset for developing FLR there.

However, structural problems in Cameroon make for serious obstacles. While FLR requires actions that cut across the fields of action of the various government ministries, these latter operate in silos, with each one tending to act in isolation, according to its own policy. This generates approaches locally that are contradictory and that lead to land conflicts. Other structural problems include the weakness of national research on forest ecology, forestry, agronomy and forest plantations. This weakness is linked in particular to the lack of stable financing, which is an obstacle to stimulating the innovations needed for FLR on the ground. Despite all the efforts made in the past to involve local populations in decision-making (Diaw et al. 2016), real implementation of this approach faces difficulty on the ground. Yet, we do know that without involvement by local stakeholders, FLR will not be sustainable. Means and tools are still lacking when it comes to monitoring and evaluating restoration efforts whose goal is to improve knowledge and correct approaches.

## Box 12.1: Refugees and FLR

In areas hosting large numbers of people displaced as a result of sociopolitical conflicts, rehabilitation of degraded spaces is a means of improving their living conditions as well as those of local populations. At the same time, it helps maintain ecosystem functions. The existence of refugees and internal displaced persons in Africa is not a new phenomenon, but unfortunately it is growing. According to the UNHCR, there were 20.36 million refugees worldwide, including 6.33 million in sub-Saharan Africa and 0.38 million in Cameroon. To this should be added an even greater number of internally displaced persons: 41.43 million worldwide, including 17.66 million in sub-Saharan Africa and 0.67 million in Cameroon (UNHCR 2018; Laird et al. 2022). These persons often remain displaced a very long time, and their status becomes permanent. Cohabitation between host populations and refugees can be a source of conflict due to the high demand for land for subsistence needs.

This situation impacts the surrounding landscapes. For this reason, beyond the urgent need to care for displaced people in the short term, planning should also adopt strategies to ensure the sustainability of natural resources for their longer-term livelihood needs through FLR. Faced with this major challenge, the Governing Multifunctional Landscapes in Sub-Saharan Africa (GML) project led by CIFOR-ICRAF seeks to contribute to sustainable management of wood fuel value chains in sub-Saharan Africa. In Cameroon, the focus has been on restoring degraded landscapes in sites in several communes in the East Region that are host to refugees from the CAR. Since more than 70 percent of these refugees live in local communities, outside of the officially designated camps, more than 78,000 seedlings of wood energy and/or fruit tree species were planted along the corridor between the municipalities of Mandjou and Garoua-Boulaï between 2020 and 2021. This is of course only the beginning of the FLR process: financial and technical support also need to be provided over the long term to ensure sustainability. To this end, the strategy has been to involve the stakeholders active in these landscapes, at all stages.

## 12.2.2   FLR strategy: the case of the Central African Republic

AFR100 proposes the Restoration Opportunities Assessment Methodology (ROAM), a guide developed by WRI and IUCN. ROAM helps to identify and organize national and regional priorities, and it proposes models with calculations of the costs and benefits of mitigation of possible carbon emissions according to the options selected by the study (Maginnis et al. 2014). Certain Central African countries now use this guide as a flexible and affordable framework to quickly identify and analyse the potential of FLR and to designate areas where there are opportunities at the national and regional levels.

In the CAR, the Ministry of the Environment, Sustainable Development, Water, Forests, Hunting and Fisheries (MEDDEFCP), in collaboration with WRI, conducted a study between 2016 and 2018 using this ROAM methodology, which led to the development of a strategy paper to guide the country's FLR policy. The paper assessed FLR opportunities for the various regions of the CAR (CAR, WRI and KfW 2017).

The initial results of the geospatial analysis of this study highlighted a great opportunity for rehabilitation, called "secondary forest restoration," on the basis of population density.
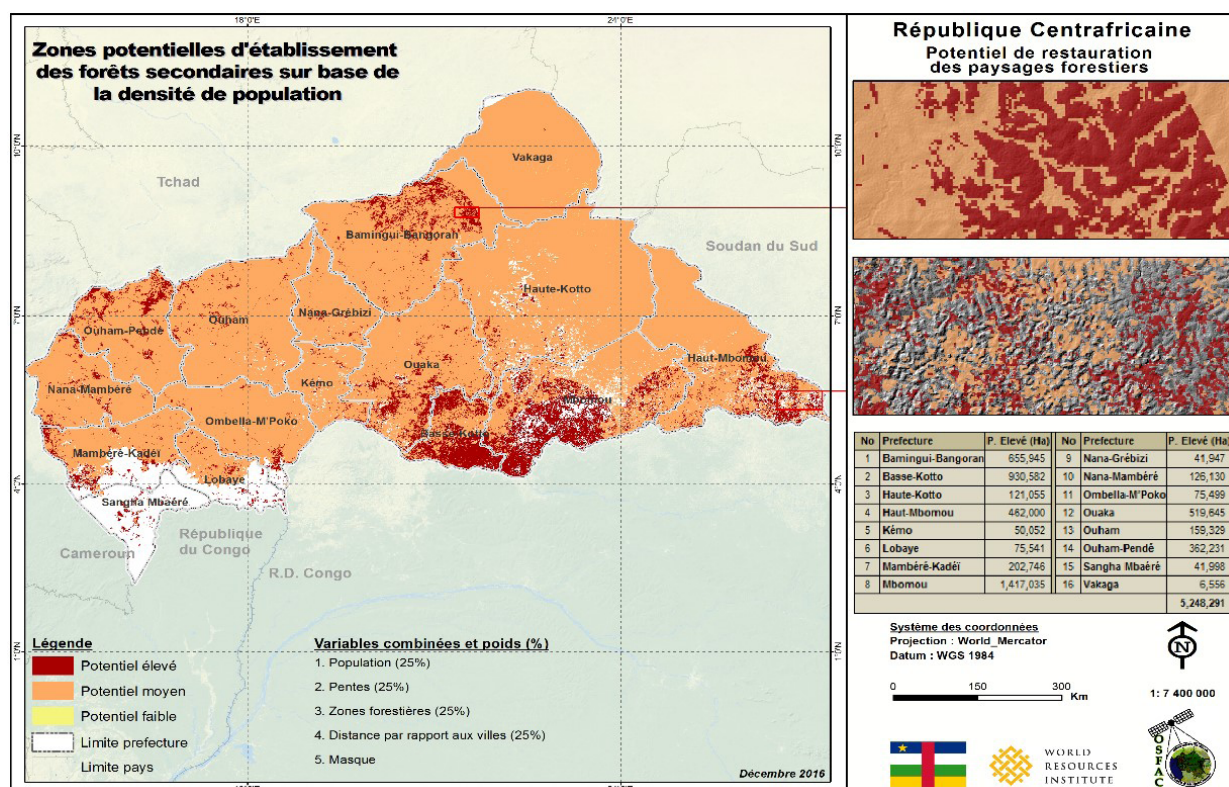
**Figure 12.1: Location of secondary forest areas in the CAR on the basis of human population density.**

Source: CAR, WRI and KfW 2017.

The map (Figure 12.1) shows the potential for FLR by reforestation around densely populated urban areas. The aim is to restore secondary forests through reforestation activities or through conservation of deforested or degraded areas around urban areas in the CAR.

Four key variables were taken into account to identify these potential areas: populations, cities, forest areas and slopes. These variables cover the CAR's 16 prefectures and have the same weight (25 percent) in the analyses for identifying these areas. The results of these analyses estimate that the surface areas with medium and high restoration potential are about 5 and 48 million ha respectively.

This map was produced with the purpose of directing the CAR's FLR policy towards deforested or degraded areas around urban areas via various conservation concession projects, botanical gardens and green spaces.

## 12.2.3   DRC: International commitments (REDD+ and CBD) and FLR

The DRC is often portrayed as a country of megabiodiversity, but the speeding up of landscape degradation there calls for more restoration efforts. The country is also committed to landscape restoration and is developing a provincial FLR strategy, which will be followed by a national strategy. Both strategies were due to be validated in June 2021.

These efforts have led to participation in international initiatives. In 2016, the DRC embarked on the process of restoring 8 million ha of degraded and deforested land as part of the Bonn Challenge.

It ratified the CBD in December 1994, the UNFCCC in January 1995, and the UNCCD in September 1997. The implementation of these initiatives has helped the country to acquire a legal arsenal on forest and biodiversity conservation. There is a very strong link between FLR and the Nationally Determined Climate Contributions (NDCs) and these other global Reducing Emissions from Deforestation and forest Degradation (REDD+) and CBD processes to which the DRC is committed.

For FLR, the national and provincial strategies under preparation emphasize the restoration of deforested and degraded ecosystems and landscapes. This restoration must be combined with other objectives, such as improvement of economic activities, food security, and people's ability to adapt to climate change and climate-mitigation projects. FLR must therefore be included into various types of development projects in order to benefit from various funding opportunities.

The provincial and national strategies are also aligned with the CAFI (Central African Forest Initiative) objectives. The objectives of the letter of intent between the government and CAFI for the 2016-2020 period were to reduce the loss of forest cover from 300,000 ha/year to 200,000 ha/year by 2020. To achieve this, several programmes were developed that would focus on the key reforms needed in land-use planning, land policy to better secure land rights in the rural sector, and investments that enhance existing actions at provincial and territorial levels in REDD+ regions.

FLR in the DRC benefits from the country's commitment in 2009 to the REDD+ process. The DRC aims to reduce national emissions from deforestation by 56 percent by 2035, in a context of sustained economic development and poverty reduction. The DRC's REDD+ strategy has identified the direct causes of deforestation and forest degradation: slash-and-burn agriculture, artisanal wood harvesting, carbonization, wood fuel, mining and bush fires. The main underlying causes include population growth, institutional aspects such as political decisions, poor governance and civil wars, infrastructure development and urbanization. In 2012, the country adopted its National REDD+ Framework Strategy, which is part of a long-term global vision for development.

This REDD+ strategy includes actions that contribute to the country's FLR. In particular, these actions include (i) the finalization and deployment of a concerted policy for the local management of natural and forest resources supported by payment mechanisms for environmental services; (ii) the rehabilitation of protected areas covering about 13 percent of national territory; (iii) extension of their surface areas to 17 percent; and (iv) the planting of 3 million ha of forests by 2025 (DRC 2012).

In 2015, the Government of the DRC adopted a REDD+ Investment Plan to mobilize the funding needed for the implementation of the National REDD+ Framework Strategy. It also established the FONAREDD+ National Fund, which received USD 200 million in financing from CAFI and other initiatives. Thanks to this financial support, at least seven REDD+ integrated programmes have been launched in the provinces (Équateur, Maï-Ndombe, Kwilou, Mongala, Maniema, and others).

These many international conventions ratified by the DRC, plus the REDD+ strategy, act as a great advantage for FLR. Policy documents are developed to help achieve the objectives set out in these conventions, in particular forest and biodiversity conservation and climate-change mitigation and adaptation. Most of them offer opportunities for financing FLR.

The DRC has developed a series of legal instruments which, if properly implemented, act as an asset for promoting FLR initiatives. These include the Law setting the general property regime and the land ownership regimes (1980); the Forestry Code (2002); the Mining Code (2002); the Law on the Environment; the Decree setting the conditions of access by local communities to forest concessions (2014); Ministerial Decree No. 026/CAB/Min/ECN-T/15/JEB/2008 setting the conditions

of suspension, monitoring and evaluation of forest capital restoration interventions; as well as the Law on the Conservation of Nature (2014).

However, the DRC continues to suffer from structural weaknesses in FLR implementation. Its institutional and technical capacities are insufficient to implement an integrated and effective approach to restoration at the provincial and local levels that would make it possible to fight land degradation and achieve sustainable management. There is no mechanism for intersectoral coordination at the provincial, local or chieftaincy levels, including on the environment, agriculture, forestry, land affairs and mining.

While political commitment to FLR does exist at the highest level in the DRC, it is not currently on the provincial agenda. Despite the constitutional prerogatives and the decentralization laws that bestow power to legislate to the Provincial Assembly and to the provincial government, these latter do not make the decrees and decisions needed for natural resources.

## The importance of looking for support for FLR

There has been little research in the South Kivu region in recent decades. But there are plans to develop research at the institutional level in South Kivu Province as part of the development of provincial and national FLR strategies, particularly on the following: (i) highlighting the value of indigenous species for restoration; (ii) scale-up of anti-erosion, agroforestry, and sustainable agriculture activities; (iii) more resilient and sustainable agricultural practices; (iv) the production and sustainable exploitation of wood fuel and timber; (v) the impact of artisanal and industrial mining; and (vi) sustainable pasture management.

### Box 12.2: FLR and land conflicts in the DRC, the case of South Kivu Province

Land concessionaires and sharecroppers are often in land conflict. However, the majority of concessions in South Kivu Province are not developed, thereby facilitating concession-grabbing by customary chiefs.

There are a number of bodies that can take action on land management and on procedures for proving land rights. Draft edicts on land-tenure security, worked out by development partners and civil society organizations, have never been promulgated.

The environment in South Kivu is threatened by exacerbated deforestation due to logging of construction timber, firewood and charcoal. Slash-and-burn agriculture and bush fires lead to the destruction of ecosystems and landscapes there.

The resurgence of jurisdictional disputes between customary powers and the land administration is exacerbating land conflicts between municipalities. There are many such conflicts on limits, inheritances, forms of ownership, and double sales, leading to endless legal proceedings.


Photo by CIFOR-ICRAF

In South Kivu Province, the ROAM approach (see above) has made it possible to identify restoration priorities. Combined with the research results, these data provide useful information for FLR. Basic information, including maps on degradation in this province, already exists.

Within the framework of the national REDD+ strategy, plans are under consideration for relaunching research applied to deforestation and degradation linked to agriculture and other factors outside the forest sector. This is why research should be a real lever for land use and development planning, by encouraging decision makers to anticipate the impacts of their choices beyond the sector they are responsible for. This research should take into account social and environmental impact assessments of development projects. To this end, it is essential to develop partnerships between Congolese universities and international research centres, such as the programme for Reviving Agricultural and Forestry Research (REAFOR, 2006-2011) financed by the European Commission and implemented by FAO.

In its 2016 updated policy paper and national biodiversity action plan, the DRC incorporated a research strategy focused in particular on the green economy and on understanding the links between poverty, environmental degradation and climate change.

### The main sources of financing FLR in the DRC

The main source of financing for REDD+ was the National REDD+ Fund (FONAREDD), with USD 200 million between 2016 and 2020. A new letter of intent between CAFI and the Government is currently under negotiation.

The Land Degradation Neutrality Target Setting Programme (LDN TSP) aims to (i) achieve 100 percent restoration of degraded land by 2030; (ii) ensure that people use all land sustainably; (iii) contribute, in doing so, to improving the livelihoods of those people; and (iv) increase forest cover by 8 million ha through the restoration of degraded forest landscapes.

There is much international support for FLR in the DRC. The National Adaptation Programme of Action for Climate Change (PANARDC) is financed by the Global Mechanism to Combat Desertification. The GEF supports the South Kivu Mountain Landscape Restoration Project and the Miombo Forest Community Management Project in Southeastern Katanga (GCP/RDC/046/FEM), and GIZ provides financial support for landscape restoration programmes in South Kivu Province.

## 12.2.4   FLR in densely populated countries: the case of Burundi

As early as the 1940s, the Belgian colonial administration adopted binding measures to slow down the degradation of natural forests and to develop forest heritage through State-owned, municipal and private afforestation at a rate of 1 ha per 300 households.

Following independence, Burundi decided to provide itself with a forestry policy and regulations. The country drew up its first policy paper, "Development of Burundi's Forest Sector," in 1969. Through it, the Government of Burundi set the national exploitation quota for natural forests at 650 ha per year and reforestation at 100,000 ha for 30 years (Département des Forêts 2012).

In 1973, the Department of Water and Forests, in collaboration with the Institute of Agricultural Sciences of Burundi (ISABU), organized the first forest symposium to work out priority orientations

and actions for the development of the forest sector. Differently from the 1969 policy paper, the conclusions of this symposium deplored the damage caused by the exploitation of natural forests. Instead, they encouraged the protection of these formations and insisted – already at that time – on land use planning and the need for forest legislation.

In addition, in order to meet the ever-growing population's needs for timber for various purposes while at the same time preserving the environment, the Burundian Government initiated a huge reforestation programme in 1978. The quantitative target was to have 20 percent of national territory reforested by the year 2000 (Besse et al. 1991).

As a result of these efforts, the national forest cover rate rose from 3 percent in 1978 to 8 percent in 1992. Approximately 75,000 ha were planted during this period. However, the war that was waged in the country from 1993 to 2003 led to the degradation of forest resources; more than 30 percent of man-made formations and 14 percent of natural formations were reportedly destroyed during this period (Ndikumagenge 1997; UNDP 1996). In this way, the rate of forest cover was estimated at 5 percent in 2005.

In 2015, Burundi, with the support of the International Union for Conservation of Nature (IUCN), organized a workshop that identified the main strengths and weaknesses of the forest sector. This country has a great wealth of natural ecosystems and of plant and animal biological diversity. These ecosystems offer varied ecosystem services that contribute to the socioeconomic and ecological development of the country. They also help reduce global warming. However, these forest ecosystems – despite the advantages they generate – are under anthropogenic pressure from expansion of agricultural land, heavy reliance on wood as an energy source, bush fires and urbanization.

More broadly, as part of its FLR policy, Burundi ratified the three Rio conventions in the 1990s: the UNCCD, the UNFCCC and the CBD. The strategies and action plan developed by the country as part of the implementation of these three conventions converge on the development of the forest sector to fight land degradation, preserve biological diversity and its habitat, and promote climate-change mitigation and adaptation.

In addition, a national forest policy, in line with other national, international, regional and subregional policies, was developed in 2012. The aim of this policy is to develop and manage forest resources rationally, by increasing the proportion of forest cover to 20 percent by 2025.

A National Convergence Plan, in accordance with the COMIFAC Convergence Plan, has also been developed and implemented. It provides for regular assessment of progress made within the framework of FLR. Meanwhile, as part of the Bonn Challenge, Burundi undertook to restore landscapes covering 2 million ha in 2020.

In the past, Burundi has conducted research on erosion and restoration opportunities; these should be updated. Indeed, quantitative studies on water erosion of cultivated soils have proven that rainfall characteristics (the volume of precipitation and its intensity) are the predominant factors. Added to this is the frequency and duration of precipitation. Studies on runoff and soil losses have shown that the increase of these losses is commensurate with the intensity of climatic events, and they have revealed a certain uniformity of behaviour according to the soil. As Burundi is a highly agricultural country, the influence of cultivation practices and anti-erosion systems has also been pointed out.

The quantitative experimental study of water erosion in Burundi helped to better identify the respective shares of the various factors of erosion and those likely to reduce it significantly. For

example, on bare ground, soil losses due to sheet erosion and rill erosion are very high. Many traditional crops grown in the direction of the slope cause significant soil losses, making them unsuitable for maintaining soil productivity and fertility. Vegetation cover of any kind is the main factor that considerably reduces water erosion of soils. Furthermore, improvement in anti-erosive cultivation practices (e.g., level line mounds, contour strip cropping, crop associations of different plant cycles, and live fencing on contour strips) reduce erosion and runoff by a factor of 2 to 50. Mulching completely reduces soil losses regardless of the slope. The only problem remains its availability in densely populated rural areas. Closed ditches on level lines, low walls and benches have limited effectiveness and require much work. Burundian peasants should therefore be discouraged from using them. Meanwhile, agroforestry is turning out to be useful both for biomass production and for ensuring a sustainable balance between fertility conservation and agricultural production.

Like other Parties to the UNFCCC, Burundi has committed to reducing its GHG emissions, by 3 percent from 2016 to 2030 unconditionally (by increasing its forest cover by 60,000 ha at a rate of 4,000 ha/year) or by 20 percent under condition of international aid, through (i) the reforestation of 120,000 ha at a rate of 8,000 ha/year from 2016 to 2030 and (ii) replacement, by the 2030 deadline, of 100 percent of all traditional charcoal ovens, with a view to limiting losses resulting from the production of charcoal and all traditional household cooking stoves. If the targets set by the country are met, 180,000 ha will have been gained by 2030, and the rate of forest cover will be 14.88 percent not including natural forests (Republic of Burundi 2019).

As Burundi is heavily involved in the various initiatives, national and regional policies are benefiting from regional subprojects on landscape restoration. These are the international commitments showing the interactions and synergies between the various conventions and initiatives (CBD, REDD, CCC, NAP/LCD, SDGs, Montreal Convention, Aichi Targets) and national policies (FLEGT, NEPAD, NRP, REDD+, PRSP, NBSAP, COMIFAC CP).

# 12.3   What kind of governance can remove barriers to FLR in Central Africa?

## 12.3.1   Commitments and barriers for FLR in Central Africa

As noted above, mobilization for the restoration of degraded land is gaining ground in Central Africa, and national initiatives are growing in number through the African Forest Landscape Restoration Initiative (AFR100[6]) sponsored by the African Union. Some Central African countries (see table 12.1) have made national commitments to promote integrated landscape and forest management, all through a large-scale reforestation programme (CAR, Cameroon, Burundi), but also through substantive work on soil and water resources management (Cameroon, Burundi) or by building on previous initiatives, such as REDD+ (DRC). These efforts are linked to other international commitments in the field of sustainable development, such as the SDGs, those related to forest exploitation, and the reduction of greenhouse gas emissions.

Landscape restoration is supported by many international donors, such as the AfDB, the EU, BMZ, BMU, the GEF and AFD, through various initiatives (e.g., CAFI, AFR100). Countries also contribute

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6   https://afr100.org/fr

directly to this effort through their budgets, via national initiatives such as "Ewe Burundi Urambaye" and the national budget in Cameroon.

At the national level, many efforts have already been made to establish the framework of the restoration process at the scale of a large region or a country (CAR, Cameroon, Burundi, DRC). Proposals also exist to define FLR at the local level of land use planning (DRC). We can thus see a twofold movement taking shape in Central Africa: a framework for restoration at the country level in connection with land use planning in a top-down movement and, on the contrary, processes that are more bottom-up, for setting the FLR objectives at the local level (as in Cameroon). The ROAM approach proposed by WRI and IUCN helps the countries that wish to do so to achieve this national framework.

But these countries still face great difficulties in implementing their very ambitious FLR objectives. The list of barriers to this implementation is long. They are more generally linked to sustainable management of natural resources and include problems of limited capacity at various levels, particularly at the local level and lack of possibilities for individuals to change their behaviour. But the causes are above all institutional and related to non-compliance with rules and the law, the sectoral approach to rural development, conflicts of interest or land, as well as security (as in the CAR, Cameroon, Burundi and the DRC). This last cause – security – is a prerequisite for FLR, because it is difficult to think about the long term when one does not know what will happen from one day to the next. Governance has also been identified as one of the main barriers to renewable resource management and FLR.

## Box 12.3: Food security and rehabilitation of Mumirwa watersheds in a rural, urban and peri-urban context: the case of the IFAD Project

The International Fund for Agricultural Development (IFAD) is making great efforts to restore forest landscapes. IFAD's main objective is to promote food security and the fight against poverty in rural areas. Since 1980, IFAD has run 13 projects and programmes, of which 8 are completed and 5 still ongoing. The average annual disbursements of IFAD's portfolio in Burundi range from USD 14 million to USD 16 million per year.

As IFAD sees it, *environmental restoration is one of the key elements in achieving good food production that can ensure food security*. This is reflected in programmes including protection of watershed soils (to preserve their fertility and to safeguard hydroagricultural infrastructure in marshes), restoration of plant cover (to preserve the water table that feeds marshes and drinking-water sources), and land cover of soil by cultivated fodder (to feed livestock).

The IFAD Transitional Programme of Post-Conflict Reconstruction contribution to FLR targets local governance issues including community development (legal and gender support, income-generating activities) and food security (seeds, fertilizers, rice, marshland development, cattle and pig farming, environmental restoration, infrastructure and health promotion).

The programme distributed 12 million agroforestry seedlings (*Eucalyptus, Cedrela, Grevillea*), 1.7 million cultivated fodder seedlings (*Calliandra, Leucaena*, Bana grass, *Tripsacum*) and 0.3 million fruit seedlings (avocado, guava and mandarin trees). More than 100,000 families have received these seedlings, and the area of protected watersheds exceeds 7,000 ha (IUCN 2015).

## 12.3.2 Governance to reconcile different interests

Governance is a set of elements that lie at the intersection of institutions, networks, directives, regulations, norms, policies, social practices, public and private stakeholders, and local and indigenous communities (Borrini-Feyerabend et al. 2014). All these stakeholders involved may initially have divergent interests.

Governance is central to FLR insofar as it allows for "good practices" that are crucial for local, national and regional initiatives to generate convincing results. Examples are inclusive decision-making and public participation, which enable the stakeholders concerned to take part in decision-making alongside the State (McLain et al. 2019). While there are many definitions of "governance," it could be summed up as follows in this context:

*The purpose of the governance of forest landscape rehabilitation is to reconcile, within the framework of the law and the rules in use, the interests of the various stakeholders who will influence the economic development and environmental quality of the territories considered, in particular by including the local populations into the decision-making process.*

This good governance includes the implementation, monitoring and evaluation of restoration methods, and it requires converting FLR into policies, programmes, and projects (van Oosten et al. 2018) and producing rules and standards that structure and coordinate it.

To generate relevant ecological, social, and economic results at various scales, FLR must be based on the determinants of its governance (Mansourian 2016; Bigombe Logo et al. 2021). These determinants include (i) relevant and adequate policies; (ii) effective regulation and coordination of implementation actions; (iii) inclusive decision-making; (iv) respect for the rights of women, local communities and indigenous peoples; (v) devolution of responsibilities; (vi) equitable access and sharing of benefits; and (vii) sufficient funding. Overall, evaluations conducted in the subregion in the past decade have called for improved governance (Yanggen et al. 2010; Hagen et al. 2011; Oyono 2015).

In terms of the governance of renewable resources, we are not starting from scratch, as concepts have evolved for at least three decades (Buttoud et al. 2016). The idea of co-management was intended to involve users – often local stakeholders – directly in the management of renewable resources, in consultation with the various levels of the State and its agencies. Co-management is a sharing of decision-making and responsibilities between the State and users. It is a strong idea that has rarely been applied in the region. Adaptive co-management enriches the idea of co-management by recognizing that the stakeholders act in complex socio-ecosystems. Also, the relationships between them must be dynamic and be able to adapt to any kind of event, such as climate change or the outbreak of a virus. Finally, the concept of multistakeholder governance (i.e., adaptive multilevel governance) further increases complexity, by integrating stakeholders at multiple levels.

FLR supposes several aspects at work: (i) bodies that work on climate change; (ii) the SDGs at international and national levels; (iii) the development goals of central or decentralized governments; (iv) stakeholders throughout value chains; (v) and local stakeholders. FLR falls indeed within the scope of multistakeholder governance.

## Inclusive decision-making and its challenges

One of the challenges facing governance and landscape restoration remains the involvement of local and indigenous communities in decision-making processes. The forest landscapes to be governed and restored are located on lands whose rights have been contested between central governments and local and indigenous communities since the colonial period (Oyono 2014). In order not to exacerbate conflicts between States and their partners on the one hand and local and indigenous communities on the other, governance and FLR must be organized using inclusive decision-making processes. Participation and involvement of local and indigenous communities are widely paid lip service in speeches and documents, but rarely observed in practice. To keep up appearances, forms of involvement and participation are very often presented by decision makers and professionals as an end in themselves. However, such approaches create more problems at the local level than they solve.

Inclusive decision-making requires a consultation process in which views are shared, objectives reconciled and options for action discussed before any consensus is reached. In the reality of Central Africa, this type of process has rarely been put into practice, as it must be distinguished from mere information or consultation. In a public information meeting, information is one-way, but local administrative authorities and land investors of course mistakenly confuse such meetings with stakeholder participation. In a consultation, on the other hand, local and indigenous communities are asked to express their views freely: these latter may be taken into account or (more commonly) not. Decision makers, investors, administrative authorities and professionals often make decisions improperly, prior to meeting with local and indigenous communities. This is typically the case for projects that are discussed above all between development agencies and donors. Ultimately, consultation consists in a confrontation of points of view before decisions are taken. The resulting synthesis effort is likely to "give a voice" to local and indigenous communities. If their voices were to be heard in an FLR programme, concerted management of forest landscapes would be possible.

There is strong demand for recognition of customary land and forest rights throughout the subregion (Oyono 2014). In many parts of Central Africa, peasant farmers' most effective way of asserting their right to land is to "break the forest." This situation is a source of conflicts on land and a hindrance to FLR activities. Inclusive decision-making is a means of reducing this risk. It also empowers local and indigenous communities on their lands and makes them less vulnerable in legal matters (Oyono 2014). This is the meaning of "free, prior and informed consent" (FPIC) developed as part of the REDD+ process (Borreill and Lewis 2009). This mechanism is based on the fact, for example, that in a landscape restoration programme, local and indigenous communities, after receiving extensive information, may be free to say "yes" or "no" – without pressure or retaliation – to the request for their adherence to the process (FAO 2017). However, this crucial mechanism is slow to be institutionalized and put into practice.

## 12.3.3   The difficulty of coordinating stakeholders for the preservation of biodiversity

The management of a country's natural heritage cannot be limited to protected areas such as national parks and wildlife reserves, as most of the natural areas designated for biodiversity preservation, with the exception of the largest and most spectacular national parks, are not large enough to ensure the long-term conservation of all species and biological processes. Most species of mammals and birds have strong needs for home ranges and distribution areas. For their survival, it is thus essential to create and develop forest networks with zoning that includes both conservation

and production areas within the extensive forest landscapes. This way, all ecological and genetic variations can be covered without neglecting marginal areas.

Sectoral management – in which everyone exploits a common good without coordination and consultation – can only lead to competition or even conflicts between users (e.g., sector against sector, upstream against downstream, protected areas against production areas, etc.) and ultimately to an unsustainable use of limited and vulnerable resources.

On the other hand, an integrated approach to forest landscapes that includes forest, ecological and socioeconomic components is seen as a prerequisite for the sustainable and multifunctional management of tropical forests at the landscape level. Indeed, the integrated approach provides the opportunity to control the impact of human activities on the connectivity between natural habitats and ecological processes throughout the landscape and thus prevent protected areas strictly speaking from becoming isolated pockets of biodiversity. The end goal is to avoid the depletion of each renewable resource and then to ensure that all management measures are integrated into the regional plan for the territory's sustainable development.

This supra-sectoral integrated management approach seeks to ensure the sustainability of natural environments by integrating them into a broader logic of land use planning and sustainable development on a landscape scale. One of its major challenges is ongoing collaboration between the various forest and hunting concessionaires, the managers of protected areas and the local populations.

However, the transformation from sectoral management of landscape mosaic components to integrated management of forest landscapes is a long process requiring a rigorous approach, a change in mindsets and a constant effort to improve strategic and operational decision-making processes. This difficulty can be seen at several levels.

At the level of institutional decision makers and government administration, there are conflicts of competences between administrations; for example, in Cameroon, the ministries of the Environment (MINEPDED), of Agriculture (MINADER), of Forests and Fauna (MINFOF), of Water and Energy (MINEE) and of Mines (MINMIDT) all work on the same aspects of the environment: soil, water and ecosystems. The actions of some constitute obstacles to the actions of others because of the lack of concerted vision. This results in contradictory authorizations being issued. Some agricultural projects, for example, do not take into account environmental requirements, let alone current forestry regulations.

Stakeholders on the ground, such as some loggers or mine operators, are taking advantage of the legal loopholes created by sectoral conflicts, which are furthering a constant and disorderly rush towards these resources. The difficulties in coordinating stakeholders for the preservation of biodiversity can only be overcome by the good governance described above. This implies that all stakeholders respect the rules that take into account the supporting capacity of habitats and the rate of natural regeneration of biological resources. Only with a critical look at the past, a clear vision of the future, and a well-defined way forward can FLR become operational and contribute to the preservation of ecosystems. There is a need for a new vision as well as for a new approach to forest landscapes linked with land use and sustainable development planning.

It is in the interest of civil society to engage in this participatory process bringing together all the representatives of the main users and managers with their partners, so as to ensure full and unreserved ownership and participation by all stakeholders. Civil society should play the role of a coordinator that further integrates local interrelationships in order to create synergies between all types of programmes that are taking place within the forest landscape in question.

Two main challenges for stakeholder coordination emerge: (a) The implementation of measures to compensate for damage to ecosystems and biodiversity. Such compensation could be demanded for pollution of water, land and air, for example, resulting from the use of pesticides, herbicides, fertilizers and other chemicals. (b) A more equitable distribution of profits, i.e., a greater share of the taxes and revenues generated on-site, should be reinvested directly into the conservation and sustainable development of production areas. This can free up financial resources that can mitigate the effects of agricultural fronts that are developing to the detriment of wooded areas.

## 12.3.4   The need to monitor results

The restoration of a forest landscape is a complex operation and requires constant monitoring of the ecological and socioeconomic effects. This must be done based on the initial objectives, which, depending on the circumstances, reconcile these two aspects by giving a greater or lesser weight to one or the other.

In the monitoring and evaluation of ecological effects, the actions carried out must be recorded, whether they are successes or failures. We could consider that the main criterion for an ecological assessment is how well the process of rehabilitating a degraded landscape progresses so that it reaches a stage with structures and properties similar to those of a local spontaneous forest. In this case, the indicators may be the degree to which animal populations originally home there are restocked in the rehabilitated forest. These "bio-indicator" animals serve as a "barometer" for the "health" of the forest.

At the scale of a managed landscape or a managed forest range, the restoration of ecosystem integrity and the quality of forest biotopes cannot be assessed by just the number of species or by an index of biodiversity; rather, they should be assessed by the long-term viability of forest fauna. Indications of changes in the abundance and distribution of forest animals are what are most useful for wildlife habitat restoration and natural habitat management. The purpose of monitoring the restoration results is to reveal the changes over space and time. The expanse of the distribution area, its continuous or discontinuous form, and whether or not its functional dynamics are undergoing progression or regression are relevant criteria for assessing the viability of a population and the integrity of its home range.

For example, during the restoration of a degraded forest, the planner expects a change in the composition and structure of the forest ecosystem: on the one hand an increase in the areas of "mature forest" with an almost closed canopy, and on the other a change in the structure of the undergrowth and the reduction of open land to small clearings.

A concept based on the management and monitoring of forest fauna will enable a rapid and periodic analysis of the dynamics of animal populations that act as indicators. The identification of evolving trends will make it possible to assess the impact of the developments undertaken and, even better, establish a prognosis on the probable development of the future restoration. Using such a scenario, rehabilitation measures can be continually adapted to the new knowledge acquired, in order to pilot FLR.

The minimum size of specific habitats and their connectivity are essential factors for the survival of forest vertebrate species and for the maintenance of associated plant associations. These factors are useful for monitoring the relevance of the zoning established within a forest range undergoing restoration. For this reason, the effectiveness of the mosaic of managed areas in restoring biodiversity can be assessed only on the basis of a few selected individual species, the so-called target species.

Monitoring should be accompanied by further research, the subjects and themes of which should be oriented according to the request of the managers and users of the areas benefiting from ecological restoration. Research should be seen as an ancillary aspect of monitoring and evaluation systems, through which certain trending phenomena will be analysed more in-depth than in standardized monitoring.

The monitoring and evaluation of economic and societal effects are equally important to ensure the sustainability of the FLR process. These indicators may relate to the contribution of the local populations over time to the FLR processes and, conversely, to the improvement by the FLR of those people's living environment and incomes. The support of indigenous peoples and local communities is a crucial factor for the success of restoration actions. However, it is conditional on a change in behaviour based on an effective awareness of the challenges of restoring natural environments and the benefits they can derive from enhancing the value of biodiversity. This adhesion can be achieved only through a sustained programme focused on dialogue, information, education and communication (IEC) in the various restoration zones. The main challenge of the IEC programme is to mobilize all stakeholders, including users and managers as well as the authorities, to take up environmental opportunities and problems, with a long-term vision, for the restoration and sustainability of forest landscapes.

# Conclusions

FLR is rightly seen as a priority for the countries of Central Africa (Besseau et al. 2018; Begeladze 2020). Given the critical mass of threats to the health of forest ecosystems in the subregion, national responses appear robust (Begeladze 2020; Tunk et al. 2016). FLR in Central Africa, while not a completely new idea, is triggering new types of processes that build on recent climate-change mitigation efforts such as REDD+. We are at the very beginning of these processes.

In many countries, these processes are still in an initial phase, at which evaluation is not yet possible. Many country commitments and strategies have been initiated within the framework of FLR, significant funding is being put in place, and some smaller projects are already underway. There is an urgent need to establish multicriteria monitoring and evaluation systems in order to steer this rehabilitation process.

In Central Africa, implementation of the FLR process reveals a lack of accompanying research in the areas of (i) genetic resource conservation; (ii) species selection; (iii) germplasm improvement; (iv) planting techniques; (v) assisted natural regeneration; (vi) research on governance, including land-tenure issues and inclusive decision-making processes; (vii) socioeconomic research, including value chains; and (viii) innovation and evaluation processes, particularly the assessment of ecological and socioeconomic impacts. Some of this research requires long-term arrangements that are difficult to maintain in Central Africa and are very rarely funded.

Forest landscape rehabilitation relies heavily on local populations, as in many cases it involves changes in agricultural and forest resource-management practices. FLR involves investing in developmental aspects that are too costly to be borne by these local populations alone. Meanwhile, governments in the region have great difficulty in providing basic services to their people, such as infrastructure and health care, education, access to electricity and drinking water, and accessible roads.

The financing of FLR therefore relies mainly on donors and the private sector. However, most donors carry out development projects over four to five years, with performance indicators associated with these durations. As rehabilitation is a long-term process, donors must also adapt their practices. Often, they want the local population to be involved, but they are not prepared to allow for the time needed on the ground to consult them beforehand. The financing of FLR may also be based on the principle of compensation or on corporate social responsibility.

Land restoration has long been seen as a way to revitalize ecosystems and build resilience to climate change, but it can also have great economic and entrepreneurial potential. The monitoring of FLR programmes currently being implemented in Central Africa should include indicators that can inform us about these different dimensions of FLR.