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## **HOW NATIONAL FOREST FUNDS CAN CATALYSE THE PROVISION OF FORESTS GOODS AND SERVICES?**

Without sponsorship

**PhD Program Coordinator:** Prof. Marco Borga

**Supervisor:** Prof. Davide Matteo Pettenella

**Co-supervisor:** Laura Secco

**PhD candidate:** Ludwig Liagre (1204263)

**Evaluators:**

Dr. Rao Matta, Food and Agriculture Organization (FAO) of the United Nations

Dr. Luca Cesaro, Council for Agricultural Research and Economics (CREA)



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**Dipartimento Territorio e Sistemi Agro-Forestali (TESAF)**

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CORSO DI DOTTORATO DI RICERCA: **Land, Environment, Resources, Health (LERH)**

Ciclo: XXXIV

**IN CHE MODO I FONDI FORESTALI NAZIONALI POSSONO  
CATALIZZARE LA FORNITURA DI BENI E SERVIZI FORESTALI?**

Senza borsa

**Coordinatore:** Prof. Marco Borga

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## List of Abbreviations and Acronyms

AF	Adaptation Fund
BCCRF	Bangladesh Climate Resilient Fund
CBD	Convention on biological diversity
CSR	Corporate Social Responsibility
E&S	Environmental & Social
EbA	Ecosystem-based Adaptation
EC	European Commission
ES	Ecosystem Services
ESMS	Environmental and Social Management System
EU	European Union
FAF	Floresta Atlantica Fund
FCCF	Forest & Climate Change Fund
FES	Forest ecosystem services
FGS	Forests Goods and Services
FLR	Forest and Landscape Restoration
FONAFIFO	National Forest Financing Fund (Costa Rica)
FONERWA	Rwanda Green Fund
FSC	Forest Stewardship Council
GCF	Green Climate Fund
GMF	Green Municipal Fund
LDN	Land Degradation Neutrality
M&E	Monitoring & Evaluation
MGFC	Mongolia Green Finance Corporation
M-NFF	Moroccan national Forest Fund
MS	Member States
NBS	Nature-based Solutions
NCF	National Climate Funds
NCS	Natural Climate Solutions
NDCs	Nationally Determined Contributions
NFF	National Forest Funds
NRRPs	National Recovery and Resilience Plans
NWFP	Non-Wood Forest products
PES	Payments for Ecosystem Services
RBP	Result-based payment
RRF	Recovery and Resilience Facility
SDF	Secondary and degraded forests
SME	Small and Medium Enterprises
TaFF	Tanzania Forest Fund
TEV	Total economic value
TZS	Tanzania Schilling
UCC	Costa Rican Carbon Units

USD	US dollar
VCS	Verified Carbon Standard
VNFF	Vietnamese National Forest Protection and Development Fund
WFP	Wood Forest Products
WTA	Willingness to accept
WTP	Willingness to pay

## Summary

Financing needs for the forest sector are increasing. Resources to be made available have to be multiplied by three by 2030 and by four by 2050 (UNEP, 2021). Besides, increasing pressures threatening forest ecosystems require innovative policy and financing approaches that will enable local forest stakeholders to protect and restore forests so they can further provide goods and services for resilient societies and economies. In this context national forest funds (NFFs) may have a critical role to play. The present research has been conducted to understand how NFFs could catalyze the provision of forests goods and services. Our analysis based on case studies shows that NFFs have a clear potential to articulate payments for ecosystem services schemes, and that they can operate as relevant intermediaries between ecosystem services providers and beneficiaries. Such a role can also be achieved through private sector support provided by NFFs as it is the case through small-scale forest businesses.

Our study also questioned how emerging financing opportunities linked to climate finance and covid-19 recovery programmes could influence the use of national forest funds. It appears that NFFs will have to evolve in an environment where new types of domestic funds emerge such as National Climate Funds, which can represent opportunities for the forest sector, including through the use of existing NFFs as financial intermediaries. Similarly covid-19 recovery programmes and related financing opportunities could be channeled through NFFs adopting a payment for ecosystem services approach (as suggested by the new EU forest strategy for example).

Finally several policy and management orientations are proposed, which would help improve the work of NFFs managers on the four key features of NFFs : capitalization, utilization, governance and monitoring & evaluation. The thesis concludes on future research perspectives and calls for the development of a ‘NFF Global network’ which could operate as a community of practice to facilitate knowledge sharing on good practices and lessons learned on NFFs.



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Ludwig Liagre, 30th November 2021

# 1. Introduction

## 1.1 Research background

### Context

Sustainable forest management (SFM) is a continuous challenge. Increasing pressures threatening forest ecosystems require innovative policy and financing approaches, such as payments for ecosystem services (PES), compensation and offset mechanisms, and REDD+ schemes, among other instruments applied to reverse forest and landscape degradation trends. Mobilizing funds from a variety of sources (public, private, domestic and international) appears critical to this end.

Financing needs for the forest sector globally are increasing. UNEP (2021) highlights that the resources available for the sector need to be multiplied by three by 2030 and by four by 2050 (equivalent to respectively close to USD 175 billion and USD 265 billion per year required in total in 2030 and 2050). With such an immense funding gap and challenges faced by the forest sector, National Forest Funds (NFFs) may offer robust and flexible solutions towards tailor-made and blended financing approaches for SFM, forest conservation and restoration. In developing as well as in developed economies NFFs can be all the more important that they may participate to the sustainable provision of forest goods and services contributing to the well-being of populations and playing an important role for poverty alleviation. IFAD (2020) specifies that less than two percent of all climate finance flows in 2019 have reached small farmers in rural areas. Forest finance articulated by domestic funds may be able to increase inclusion of small farmers and rural population at the benefit of forests.

In this context the research project aimed at analysing in which conditions NFFs can indeed contribute to the provision of forest goods and services. The research conducted sought to observe NFFs as innovative forest policy and financing tools which can support the sustainable provision of ecosystem services. It explored in particular the key NFF features, utilization modalities, and management options which can ensure provision of forest goods and services on the long-term. Different NFF models in different contexts have been analyzed and discussed to identify good practices, lessons learned and gaps to be addressed by decision-makers.

## **What exists in the literature?**

The literature offers a review of existing models of NFFs, in a quite descriptive approach (FAO, 2015; FAO & GIZ, 2013; Rosenbaum & Lindsay, 2001). A categorization of NFFs has been established by FAO & GIZ (2013) and used further by Matta (2015). This categorization follows a list of key features (as defined in FAO & GIZ, 2013; and FAO, 2015):

- Governance – the way NFFs are steered and managed.
- Capitalization – how NFFs are capitalized, potentially from domestic, international, public and private sources.
- Monitoring/oversight – how Monitoring and Evaluation of NFF impacts and key processes is ensured.
- Utilization – the way NFFs resources are spent, e.g. through grants, incentives, PES approaches, loans, etc

## **What is missing? What are the Knowledge gaps?**

Based on the analysis of the literature, following knowledge gaps appear:

- There is a lack of a critical analysis of the existing features framework (four features above). One could ask if the identified NFF features framework is comprehensive and appropriate. Other features like “decentralization” for example could be isolated as an important feature per se.
- Besides it seems there is a lack of studies analyzing the correlations between features and the provision of forest goods and services, indeed between the features and the NFF impacts. It is currently difficult to say which NFF model would be more impactful in a given context.

## **1.2. Problem statement : research questions and objectives**

Given the pending questions on what makes NFFs impactful for the sustainable provision of forests goods and services, main objective of the research is to specify which features enable National Forest Funds (NFFs) to enhance the provision of forests goods and services (FGS).

Specific objectives include:

- To analyze appropriateness and completeness of the existing NFFs features framework (based on these key features : i) capitalization, ii)utilization, iii)monitoring & evaluation/oversight, and iv) governance.
- To develop a conceptual framework for defining effective NFFs utilization and governance for the provision of FGS.
- To identify policy recommendations and orientations for decision-makers and NFFs managers.

The PhD thesis explored in particular following questions:

- How can the current NFFs features framework be revised to include all appropriate features required for the provision of FGS?
- Which conceptual framework can be designed to support selected NFFs features (such as utilization and governance) in the provision of FGS?
- Which policy recommendations and orientations can be formulated towards decision-makers and NFF managers?

### 1.3. Theoretical framework elements

The PhD project builds on concepts related to environmental economics, in particular on ecosystem services (ES) and the notion of externalities. It also includes a strong emphasis on the concept of Payments for Ecosystem Services (PES), and their variations from the pure market-based PES definition by Wunder (2005), to PES-like and quasi-PES as defined by Masiero & Pettenella (2017).

Besides the project builds on the concepts related to public finance and public policies, emphasizing the possible roles that governments can play in the economy, while the research also addresses the interface between public and private finance, with funds examples that may qualify as ‘private funds’. Indeed

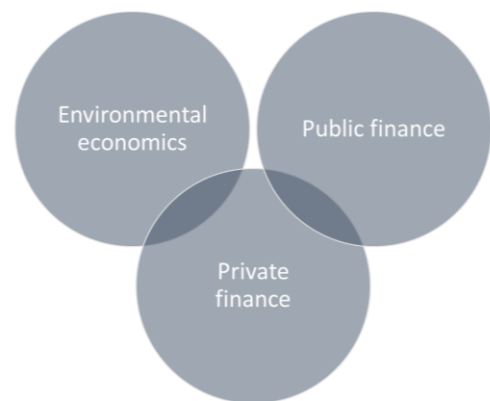


Figure 1: Key theoretical fields

more and more efforts seek to address the importance of private capital mobilization for the provision of ecosystem services (Castren & al, 2014; World Bank, 2020). And Singer (2016) emphasized the need for forest finance approaches that capture the diversity of domestic, international, public and private sources.

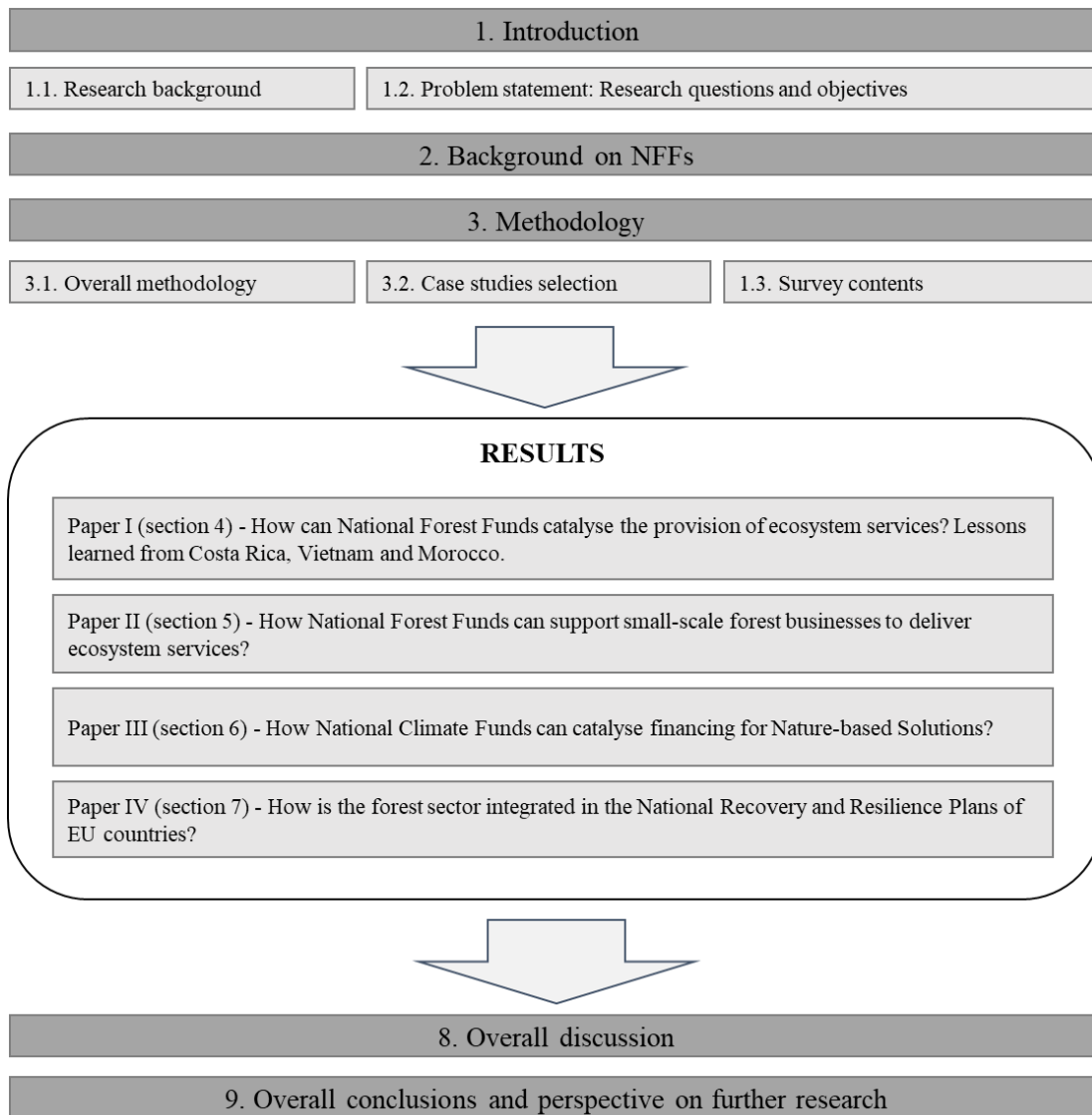
The research project thus navigates between these concepts (fig. 1) to ensure the perspective on NFFs is broad enough and goes beyond the traditional frontiers between public and private financing. Even though the funding rationale may vary from a public to a private fund (in particular in terms of types of returns' expectations), topics like the internalization of externalities is an important consideration for both categories of instruments, including in terms of utilization and capitalization approaches.

## **1.4 Thesis contents and structure**

Section 1 presents the the research background, the problem statement and the research questions and objectives of the thesis. Section 2 highlights some background elements on NFFs and section 3 presents the methodology of the PhD research project, highlighting case studies' examples and the data collection approach (fig. 2).

Results are made of four papers :

- Paper I: How can National Forest Funds catalyse the provision of ecosystem services? Lessons learned from Costa Rica, Vietnam and Morocco.
- Paper II: How National Forest Funds can support small-scale forest businesses to deliver ecosystem services?
- Paper III: How National Climate Funds can catalyse financing for Nature-based Solutions?
- Paper IV: How is the forest sector integrated in the National Recovery and Resilience Plans of EU countries?



*Figure 2: Structure of the PhD thesis (source: own elaboration)*

Table 1 provides the justification and rationale for their incorporation in the thesis.

The two first papers (I and II) directly contribute to shed light on how NFFs can unleash the provision of forests goods and services. And the two additional papers (III and IV) indirectly inform how NFFs can better support provision of forests goods and services. Indeed, the latter explore some of the emerging forest finance trends that NFFs can foster. Those include nature-based solutions to climate change (paper III) and Covid-19 recovery efforts (paper IV).

Table 1: PhD thesis' papers articulation with key objective

<b>Paper</b>	<b>Link to NFFs</b>	<b>Addressing the provision of forests goods and services</b>
<b>I</b>	Key focus of the paper	Key objective of the paper
<b>II</b>	Key focus of the paper	Key objective of the paper
<b>III</b>	The National Climate Funds (NCFs) topic embed the forest perspective. NCFs represent an emerging type of funds from which NFFs can learn from.	The Ecosystem Services perspective is taken into account through the Nature-based Solutions concept. The paper explores how NCFs integrating NBS can play a role for PES approaches.
<b>IV</b>	Among other aspects, the paper questions how NFFs could be part of National Recovery and Resilience Plans (NRRPs).	The paper analyses how Ecosystem Services are supported by NRRPs, including on the possible role of NRRPs for PES approaches.

Table 2 presents the roles played by the different contributors to the papers forming part of the thesis.

Table 2: Roles played by various contributors for the development of key papers

<b>Responsibility/task</b>	<b>Paper I</b>	<b>Paper II</b>	<b>Paper III</b>	<b>Paper IV</b>
<b>Overall responsibility</b>	L.L.	L.L.	L.L.	G.B., L.L.
<b>Conception and design</b>	L.L., D.P., L.S.	L.L., D.P., A.P., L.S.	L.L., D.P.	G.B., L.L., D.P.
<b>Methodology design</b>	L.L., D.P., L.S.	L.L., D.P., A.P., L.S.	L.L.	G.B., L.L., D.P.
<b>Data collection</b>	L.L., F.C., A.G. C.C.	L.L., A.P.	L.L., L.A.	G.B., L.L.
<b>Data analysis</b>	L.L., A.P.	L.L., A.P.	L.L.	G.B., L.L.
<b>Results interpretation</b>	L.L., D.P., A.P.	L.L., A.P.	L.L.	G.B., L.L., D.P.
<b>Manuscript writing</b>	L.L., A.P.	L.L., A.P.	L.L., L.A.	G.B., L.L.
<b>Revision</b>	D.P., L.S.	D.P., L.S.	D.P.	D.P.

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## 2. More background on NFFs

### Key definitions

As pointed out by Rosembaum & Lindsay (2001) national forest funds can have diversified forms depending on objectives, capitalization, beneficiaries and spending approaches and thus the term “national forest funds” rather corresponds to a “constellation of approaches”. Matta (2015) describes them as “dedicated financing mechanisms established with the main objective of supporting the conservation and sustainable use of forest resources”.

One of their common characteristics is to be extra-budgetary funds, so “they exist for more than a single government budget cycle” (Rosembaum & Lindsay, 2001). Indeed this aspect is particularly important to justify the existence of national forest funds, instead of using the general budget. As a matter of fact the forestry sector requires flexibility and speed in the use of funds due to the seasonal conditions of forest activities and the urgency of some forestry actions. For example forest fires and control of pest outbreaks requires urgent and potentially additional actions not easily foreseeable in the context of the general budget. Besides climate change is causing changes in the plantation schedules and is also a root cause for more fires, pests and diseases which require dedicated financing.

Further the forestry sector is often a source of revenues through taxes and fees on forest products and activities. To ensure a significant amount of these resources collected are effectively allocated to forestry activities NFFs play a critical role. Far too often these revenues are collected in the general budget and not significantly reallocated to the forestry sector.

FAO & GIZ (2013) identifies “two basic types of NFFs: i)Transfer funds: essentially a distribution platform for funding streams from donors to beneficiaries (mainly public sources), and ii)Catalytic funds, which provides finance/support to overcome socio-economic obstacles/crises and to prepare future commercial development more and more independently from public sources.” FAO & GIZ (2013) also considers that NFFs are different from commercial forestry funds which main objective is to provide returns to investors. In the present PhD research project the scope of NFFs definition would partly include private sector considerations when NFFs are based on public-private partnerships and can offer an investment window alongside financing searching for environmental and social returns. The two basic



types of NFFs described above will thus be considered, as well as forestry impact funds but not the purely commercially driven funds (such as Timber investment Management Organizations), where state interests are absent.

### Geographical presence and financial flows

NFFs are present on all continents with a majority found in Africa (approximately 47% of them), 17% in Asia-Pacific, 15% in Central and South America, 13% in North America and 8% in Europe (FAO, 2015). Thus more than 75% of the existing NFFs are found in developing and emerging countries.

Between 2001 and 2014 the number of NFFs has steadily increased (by 34%) as described in figure 3 and NFFs in developing countries “hold or manage an estimated US\$12–13 billion” as specified by FAO (2015). Annex 2 provides an overview of NFFs globally.

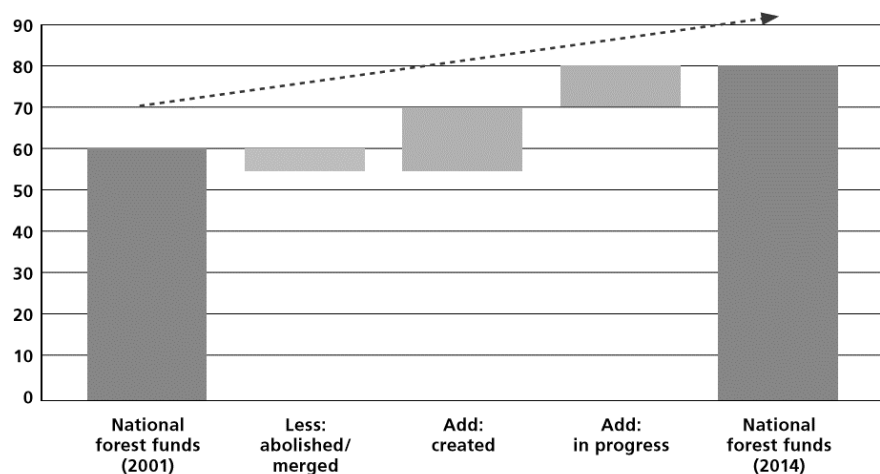


Figure 3: Growth in the number of NFFs between 2001 and 2014 (FAO, 2015)

### Underlying legal/juridic forms and institutional setups

NFFs have very diversified legal status, depending on fund objectives, capitalization and utilization approaches. Table 3 provides indications for a limited number of NFFs.

*Table 3: Legal form of selected NFFs*

<b>Legal options</b>	<b>NFFs indicative examples</b>
Public entity	FONAFIFO (Costa Rica)
Account (as a separate account under an existing government budgetary provision)	Moroccan NFF, Madagascar NFF (current)
Trust fund	FONERWA (Rwanda), VNFF (Vietnam)
Foundation	FAPBM (Madagascar)

NFF juridic forms are very much dependent of national legislations. Indeed when selecting the adequate legal status for a NFF in design a comparison has to be conducted among diverse types of legal status, and only those with a proper legal background (law, decree, etc) can be selected.

### 3. Methodology

#### 3.1 Overall approach

The PhD research built mostly on case studies analysis and direct engagement with key stakeholders through semi-direct interviews and surveys.

Research work had to adapt to the Covid-pandemic, and while travels were planned to allow for on-site data collection, online approaches had to be organized instead. More than forty semi-direct interviews were conducted to collect the information necessary for this research.

In this context, for each article of the PhD research project a similar approach was adopted, with following steps:

- Literature review on case studies
- Identification of relevant case studies
- Survey development
- Data collection and elaboration

#### 3.2 Cases studies selection

For each paper, a selection of case studies took place. Selected case studies are specified in table 4. The selection of the case studies was based on some criteria, among them: i) is the fund operational and has more than three years' experience? ii) does the fund serve objectives of relevance for forest activities? iii) does the fund demonstrate interest and/or potential for the provision of ecosystem services?

*Table 4: Selected case studies*

Research article (title)	Case studies
<b>How can National Forest Funds catalyse the provision of ecosystem services? Lessons learned from Costa Rica, Vietnam and Morocco</b>	<ul style="list-style-type: none"><li>• Vietnamese National Forest Fund (VNFF)</li><li>• Forest Financing Fund (FONAFIFO), Costa Rica</li><li>• Moroccan National Forest Fund (M-NFF)</li></ul>

<p><b>How National Forest Funds can support small-scale forest businesses to deliver ecosystem services?</b></p>	<ul style="list-style-type: none"> <li>• Floresta Atlantica Fund, Portugal</li> <li>• Forest Financing Fund (FONAFIFO)/Forest credit window, Costa Rica</li> <li>• Tanzania Forest Fund (TaFF)</li> <li>• Luxembourg Forest and Climate Change Fund (FCCF)</li> <li>• National Forest Fund, Guatemala (FONABOSQUE)</li> </ul>
<p><b>How National Climate Funds can catalyse financing for Nature-based Solutions?</b></p>	<p>Case studies include</p> <ul style="list-style-type: none"> <li>• Bangladesh Climate Resilience Fund</li> <li>• Rwanda Green Fund (FONERWA)</li> <li>• Mali Climate Change Fund</li> <li>• Climate Resilience Green Economy (CRGE Facility), Ethiopia</li> <li>• Fonds National pour l’Environnement et le Climat (FNEC), Benin</li> <li>• Green Municipal Fund (GMF), Canada</li> <li>• Jordan Environmental Fund (JEF)</li> <li>• Mongolia Green Finance Corporation (MGFC)</li> <li>• Environmental Investment Fund (EIF) – Namibia</li> <li>• Costa Rican Forest Financing Fund (FONAFIFO)</li> </ul>

### 3.3 Survey contents

#### Key surveys’ questions

For each paper, a survey has been developed, enabling data collection. Some of the key questions addressed in the surveys are included in table below.

*Table 5: Research articles & key questions*

Research article	Key questions (a sample)
<p><b>How can National Forest Funds catalyse the provision of ecosystem services? Lessons learned from Costa Rica, Vietnam and Morocco</b></p>	<p>This paper used data collected through the survey presented in Annex 3. The first paper built on answers provided by NFFs managers from the 3 selected case studies.</p>
<p><b>How National Forest Funds can support small-scale forest businesses to deliver ecosystem services?</b></p>	<ul style="list-style-type: none"> <li>• How are NFFs designed and how are their operations structured? What type of funding windows are targeting small-scale enterprises?</li> </ul>

	<ul style="list-style-type: none"> <li>• What is the typology of beneficiaries under the small-scale enterprises funding windows?</li> <li>• What could be a relevant framework for assessing how NFFs support small-scale enterprises in delivering ecosystem services?</li> </ul>
<b>How National Climate Funds can catalyse financing for Nature-based Solutions?</b>	<ul style="list-style-type: none"> <li>• How existing NCFs support Nature-based Solutions? With what financing instruments? Under what conditions?</li> <li>• What added value do NCFs bring in financing Nature-based Solutions? What are good practices of NCFs funding for NBS?</li> <li>• How NCFs can enhance landscape approaches promoting Nature-based Solutions for effective ecosystem restoration?</li> </ul>

Survey example:

Below survey was used for the paper under the title “How National Forest Funds can support small-scale forest businesses to deliver ecosystem services?”. Key questions of the survey include:

<b>General fund information</b>
<ul style="list-style-type: none"> <li>• Contact person, contact details</li> <li>• Website</li> <li>• Headquarters address</li> <li>• Legal form</li> <li>• Funding volume in the last 5 years</li> <li>• Operational scale (e.g. how much is invested per year)</li> <li>• Sectors/areas of interest or type of projects supported</li> </ul>
<b>Inclusion of small-scale forest businesses in the fund strategy and operations</b>
<ul style="list-style-type: none"> <li>• Are small-scale forest businesses included in your funding strategy? If yes, why?</li> <li>• Is the fund mostly supporting wood forest businesses? non wood forest businesses? Or both? Please specify</li> </ul>
<b>Funding windows and instruments for small-scale forest businesses</b>
<ul style="list-style-type: none"> <li>• What type of funding windows are targeting small-scale forest enterprises?</li> <li>• What funding volume does it represent and in proportion of the total funding volume?</li> <li>• What are the financing instruments provided by the funds (grants, loans, equity, etc.) to small-scale enterprises? in what proportions?</li> </ul>
<b>Typology of beneficiaries among small-scale forest businesses</b>

- Could you specify who are the beneficiaries of the funding windows targeting small-scale businesses? What are their legal forms in general?
- How do these businesses generate revenues? On what segment of the value chain are they operating? In short what are their underlying business models? Please specify (if possible)
- How is the project bankability of small-scale forest businesses evaluated by the fund? Does it differ from larger businesses?
- Do they have access to a local and/or national and/or international market for their products and services?
- What size do they have in terms of turn over? (an estimation would suffice)

### **Monitoring on funds' impacts on ecosystem services**

- Is there a Monitoring & Evaluation (M&E) system in place at the fund level? to monitor impacts of the projects supported by the fund?
- Which impacts does the fund monitor in priority? Environmental and/or social and/or financial returns (for example)?
- Are forest ecosystem services part of this M&E system? If yes, please specify
- If not, could you please explain what are the underlying reasons? (lack of data, of technical expertise, etc)
- More specifically how are you monitoring the impact on forest ecosystem services of the support provided to small-scale forest businesses?
- In your point of view, is there a correlation between the beneficiary type and the delivery of forest ecosystem services? Is there an impact of the funding instrument on the delivery of forest ecosystem services?
- What recommendations would you have for a M&E system addressing how small-scale forest businesses actually support the delivery of forest ecosystem services?

## 4. Paper I - How can National Forest Funds catalyse the provision of ecosystem services? Lessons learned from Costa Rica, Vietnam and Morocco

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Authors: Ludwig Liagre<sup>a\*</sup>, Davide Pettenella<sup>a</sup>, Alex Pra<sup>b</sup>, Felipe Carazo Ortiz<sup>c</sup>, Alberto Garcia Arguedas<sup>d</sup>, Cuong Nguyen Chien<sup>e</sup>

<sup>a</sup> TESAF Department, University of Padova, Viale dell'Università, 16, 35020 Legnaro (PD), Italy

<sup>b</sup> ETIFOR, Padova University spin-off, Piazza De Gasperi 41, 351321 Padova (PD), Italy

<sup>c</sup> Tropical Forest Alliance, World Economic Forum, Switzerland.

<sup>d</sup> Fundación Banco Ambiental (FUNBAM), Costa Rica

<sup>e</sup> Vietnamese National Forest Protection and Development Fund (VNFF), Vietnam.

### Highlights

- National Forest Funds (NFFs) have a significant role to play in supporting the provision of Ecosystem Services (ES) and biodiversity conservation.
- Many existing NFFs could be adapted to operate as Payment for Ecosystem Services (PES) or PES-like mechanisms.
- NFFs can play an intermediary role between ES providers and ES buyers.
- NFFs operating as PES-like schemes meet the PES preconditions of additionality, conditionality, and permanence.
- Best practices from existing NFFs operating as PES-like mechanisms enable the definition of policy and management orientations towards the improvement of other NFFs.

### Abstract

National Forest Funds (NFFs) represent a significant funding source for the forest sector globally. Integrating biodiversity in these domestic financing instruments could be an opportunity to increase financing flows for biodiversity conservation and the provision of ecosystem services.

In this paper, we analysed three NFF case studies (Costa Rica, Morocco, and Vietnam) in order to assess, with operational examples, if and to what extent NFFs already operate on Payments for Ecosystem Services (PES) or PES-like mechanisms.

The analysis highlights the fact that all the evaluated NFFs have PES-like mechanism characteristics and that NFFs could play a relevant intermediary role between ecosystem services providers and buyers. While several countries are in the process of establishing or reforming NFFs, there is a window of opportunity to mainstream biodiversity objectives in NFFs, including for PES-like schemes.

We also derived policy and management recommendations from the analysis with the aim of supporting the design or reform of NFFs, considering biodiversity conservation and the provision of ecosystem services objectives. The article finally draws attention to how these orientations could be applied to one of the NFF case studies, *i.e.* Morocco.

Keywords: Biodiversity finance; Ecosystem Services; National Forest Funds; Payments for Ecosystem Services

## **4.1. Introduction**

Given that there are more than 80 existing National Forest Funds (NFFs) worldwide and these hold and/or manage an estimated USD 12–13 billion in developing countries, NFFs can be considered a significant source of finance for forestry projects and initiatives globally (FAO, 2015; Rosenbaum & Lindsay, 2001).

As highlighted by Rosenbaum & Lindsay (2001) NFFs can take diversified forms depending on objectives, capitalization, beneficiaries and spending approaches and, therefore, the term “national forest funds” corresponds to a “constellation of approaches”. In this paper, we refer to the FAO (2015) definition of NFFs, which describes them as “dedicated financing mechanisms established with the main objective of supporting the conservation and sustainable use of forest resources”.

As stated in FAO (2015) “NFFs are dedicated financing mechanisms for supporting sustainable forest management, often also encompassing climate change mitigation, biodiversity conservation and the restoration of degraded lands”. Some NFFs, e.g. the Tanzania Forest Fund (TFF) and the National Forest Financing Fund in Costa Rica (FONAFIFO), are assimilated with conservation funds and/or environmental funds (CFA, 2020; RedLAC, 2010), and are



already part of networks such as the Consortium of African Funds for the Environment (CAFÉ) and the Network of Environmental Funds in Latin America and the Caribbean (RedLAC).

Against this background, in the present paper we look into the role of existing NFFs in activating Payments for Ecosystem Services (PES) or PES-like mechanisms. Our hypothesis is that the facilitation and supporting role played by NFFs for activating PES and PES-like mechanisms may have been underestimated thus far, and could represent a relevant opportunity to contribute towards addressing the current global challenges of biodiversity conservation and ecosystem restoration. In addition, NFFs may potentially be considered as strategic financing tools in the framework of the post-2020 global biodiversity framework and the upcoming United Nations Decade on Ecosystem Restoration 2021-2030.

More specifically, the objectives of this paper are: 1) to assess if and how far NFFs already operate on PES or PES-like mechanisms; and 2) to derive lessons learned as well as policy and management orientations for NFFs managers in order to deliver better on biodiversity conservation and the provision of ecosystem services.

Many of the existing NFFs are experiencing structural and operational challenges and are under a reform process for improving their efficacy and impacts; in particular, with a focus on the delivery of Sustainable Development Goals (SDG)-related impacts. In this paper, we carefully derive lessons learned from three NFFs case studies, which can provide useful policy and management recommendations to NFFs' managers and to forest and environmental departments of the public administration, especially in the context of developing countries.

## **4.2. Methodology**

### **4.2.1. Data collection**

The present analysis builds on a literature review on NFFs and their role in activating PES and PES-like mechanisms. While the scientific literature on PES and PES-like mechanisms is relatively rich, there is still a scarcity of literature in scientific databases concerning NFFs. Most of the publications addressing this topic are found in grey literature; in particular, reports and studies by international organizations (e.g. FAO, GIZ, CATIE).

In order to integrate the information collected through the literature review, further data has been collected through direct interviews with NFFs' managers and advisors. The interviews

were based on a survey developed to collect a wide range of data on specific NFFs, including the case studies used in the analysis.

In addition, this paper benefits from the direct experience of the authors working closely with NFFs' teams or operating as advisors for these funds. All information data used in this paper were collected with the support of NFFs' managers and advisors, which also contributed, through their revisions and support, to improve the robustness of the study. Interviews were carried out from June to December 2019.

Finally, the analysis also builds on a previous study on PES opportunities in the Ifrane National Park, Morocco (GIZ, 2015). This study<sup>1</sup> was conducted in the context of a south-south cooperation between Morocco and Costa Rica to exchange good practices on PES and NFFs.

#### **4.2.2. NFFs' key features considered in the analysis**

As proposed by FAO-GIZ (2013) and FAO (2015), the key NFF features which are considered in this analysis include: i) capitalization; ii) governance; iii) utilization; and iv) monitoring & evaluation/oversight.

Capitalization (i) refers to how NFFs are capitalized, e.g. from domestic, international, public and private financial sources. Governance (ii) refers to the way NFFs are steered and managed, which can be based on different approaches: from a governance system centralized in a specific organization to an open governance with inclusion and participation of a diversity of stakeholders such as ministries and public agencies, civil society organizations, and the private sector. Utilization (iii) refers to the way NFFs resources are spent, including the types of financing instruments, e.g. loans, grants, incentives, PES mechanisms, and the types of beneficiaries, e.g. individuals, associations, cooperatives, businesses. Finally, monitoring & evaluation/oversight (iv) refers to approaches and tools for ensuring that the NFFs impacts and key processes are ensured. This involves the application of good financial governance, control and audit mechanisms, the development of monitoring-reporting and verification (MRV) approaches with Geographical Information Systems (GIS) technologies and indicators frameworks. (FAO, 2015; FAO-GIZ, 2013).

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<sup>1</sup> South-south cooperation project between Costa Rica and Morocco with GIZ facilitation. See: <https://www.giz.de/en/worldwide/28717.html>

### 4.2.3. Case studies in Costa Rica, Vietnam, and Morocco: operational NFFs delivering ecosystem services

This paper focuses on three case studies of NFFs that have been active for many years: the National Forest Financing Fund (FONAFIFO) in Costa Rica, the Vietnamese National Forest Protection and Development Fund (VNFF) in Vietnam, and the Moroccan National Forest Fund (M-NFF) in Morocco. Table 6 describes the key elements of the three cases.

Table 6: Cross-comparison of the three case studies

Country	Costa Rica	Vietnam	Morocco
<b>Name</b>	National Forest Financing Fund (FONAFIFO) <sup>2</sup>	Vietnamese National Forest Protection and Development Fund (VNFF)	National Forest Fund (M-NFF)
<b>Legal underlying</b>	Forestry law n°7575	Decree n°5 on VNFF Decree n°147/2016/ND-CP Decree n°99/2010/ND-CP on PFES	Decree n° 1855-01
<b>Legal form</b>	Public entity (agency)	Public entity (agency)	Account
<b>Fund type</b>	Revolving	Revolving	Revolving
<b>Operational since</b>	1996	2008 (VNFF establishment); 2010 (PFES)	2002 (compensation mechanism)
<b>Governance</b>	Open (to multiple sectors)	Open (to multiple sectors)	Restricted (to forest administration and finance ministry only)
<b>Decentralization</b>	Yes, with regional offices	Yes, with provincial funds	No
<b>Utilization</b>	Economic incentives	Economic incentives	Compensation payment
<b>Capitalization</b>	Taxes (oil, water), CSR contributions, bilateral and multilateral funding	PES contributions from economic sectors (hydropower, water distribution, industry, ecotourism, etc)	Taxes on imported wood, other domestic forest related revenues
<b>Capitalization/year<sup>3</sup></b>	~25 M USD	~100 M USD	~7-8 M USD
<b>Oversight/M&amp;E</b>	Independent and external audit	Independent and external audit	Internal audit only

<sup>2</sup> www.fonafifo.go.cr

<sup>3</sup> Average in the last 5 years (2015-2019)

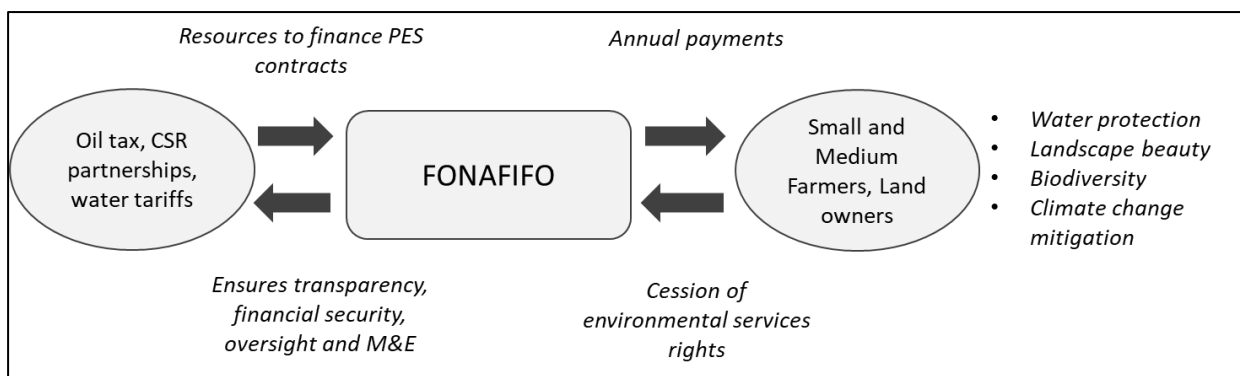


Figure 4 : PES scheme of FONAFIFO in brief (own elaboration adapted from FONAFIFO, 2015)

	<b>Forest protection for water resources</b> \$400 / ha in 5 years \$80 / ha / year 2 ha min - 300 ha max		<b>Natural regeneration</b> \$205 /ha in 5 years 20% per year 2 ha min - 300 ha max Contracts for 5 years
	<b>Forest protection for biodiversity conservation</b> \$375 / ha in en 5 years \$75 / ha / year 2 ha min - 300 ha max		<b>Reforestation</b> \$980 /ha in 5 years 1-50%, 2 -20%, 3 -15%, 4 -10%, 5 -5% 1 ha min - 300 ha max Contracts for 15 years
	<b>Forest protection</b> \$320 / ha in 5 years \$64 / ha / year 2 ha min - 300 ha max		<b>Agroforestry</b> \$1.3 /tree in 3 years 1- 65%, 2- 20%, 3-15% 350 trees min - 10.000 max Contracts for 5 years

Figure 5 : Examples of PES modalities, FONAFIFO – non-exhaustive and illustrative (FONAFIFO, 2015)

While the three models are different, they all have a legal base, operate as revolving funds, and provide economic incentives for the provision of ecosystem services (FONAFIFO and VNFF) or compensation payments (M-NFF).

FONAFIFO<sup>4</sup> presents several remarkable characteristics. Firstly, ecosystem services to be paid for (i.e. biodiversity, water, carbon, landscape beauty) and the PES system are integrated within the forestry law and related regulations. Secondly, direct individual payments are granted to households/farmers, as described in Figure 4, and differentiated financial incentives are provided, depending on ecosystem types or land-use patterns (figure 5). One of the success factors of this approach is the land ownership (land-rights securitization) which covers the totality of the Costa Rican territory. Local associations and groups representing vulnerable people (such as those in indigenous territories) are also eligible to perceive payments, following FONAFIFO conditions. Moreover, FONAFIFO is capitalized through diverse sources

<sup>4</sup> [www.fonafifo.go.cr](http://www.fonafifo.go.cr)

including an oil tax, water tariffs, and partnerships with the private sector (Table 7). Finally, decentralized offices for local management and technical assistance (regional FONAFIFO offices) enable close support for the PES beneficiaries. Coordination at national and decentralized levels is ensured with other state organizations such as the National System for Conservation Areas (SINAC).

*Table 7: PES revenues in Costa Rica in 2019 (source: adapted from FONAFIFO, 2019)*

<b>Revenue/PES spending</b>	<b>USD</b>	<b>%</b>
Oil tax	17,919.144	72.5%
Water tariff	2,294,680	9.3%
CSR partnerships	39.712	0.2%
Remaining from previous year	4,468.068	18.1%
<b>Total</b>	<b>24,721,064</b>	<b>100%</b>

The case of the VNFF<sup>5</sup> in Vietnam is characterized by an important level of decentralization, with the existence of provincial funds connected to the VNFF. Starting from just four provincial funds in 2009, 46 provincial funds were established in 2019. The capitalization is based on diverse sources of financing, including hydropower companies, water suppliers and tourism sector contributions, among others. This ensures a solid revenue stream. Table 8 highlights the different financing sources of the Vietnamese Payment for Forest Ecosystem Services (PFES) mechanism, currently mobilized and in development. For example, PFES contributions from the aquaculture and industrial sectors have been tested in the last years (iPFES, 2017). Capitalization efforts in recent years have enabled a major increase of the VNFF revenues, from close to 60 million USD in 2016 to more than 130 million USD in 2018. It is notable that a REDD+<sup>6</sup> trust fund is operating under the umbrella of the VNFF in order to ensure synergies with other forest financing sources (from carbon and climate finance sources). The optimization of financing flows towards final beneficiaries is ensured, as shown in figure 6. Only 0.5% are mobilized for administrative costs at the national level, and about 15% at the level of provincial funds where the administrative management is more demanding. Thus, between 75% and 85% of initial funds effectively reach local final beneficiaries. Tests are

<sup>5</sup> [www.vnff.vn](http://www.vnff.vn)

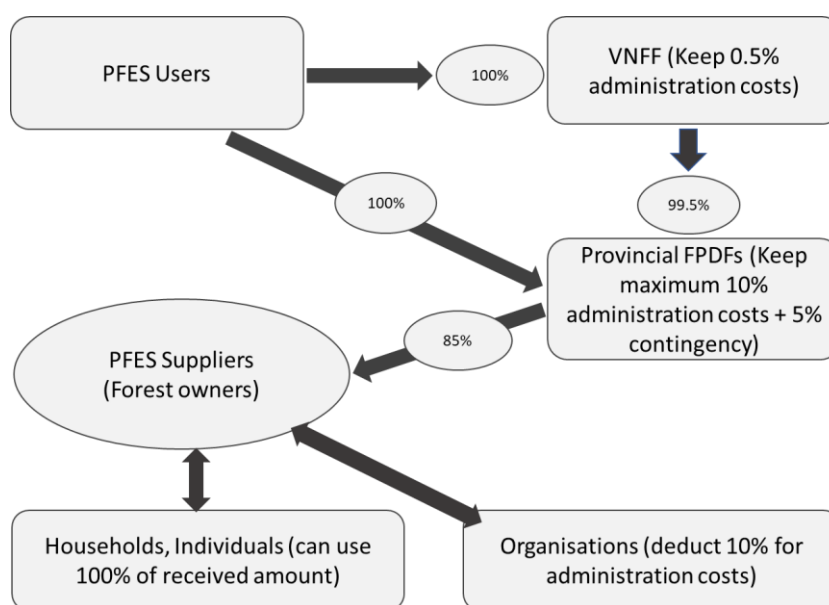
<sup>6</sup> Reducing Emissions from Deforestation and Forest Degradation

ongoing for a wide use of GIS monitoring technologies, as well as e-payment systems to increase efficiency in PES delivery<sup>7</sup>.

Table 8: Revenue sources of the VNFF in Vietnam (source: Nguyen Chien, 2019)

Revenue/PES spending	Amount (USD)	%
Hydropower (indirect)	0,0015 USD/kwh	96.7%
Clean water suppliers (indirect)	0,0022 VDN/m <sup>3</sup>	2.9%
Industry facilities (indirect)	0,0021 VDN/m <sup>3</sup>	0.01%
Eco-tourism operators (direct)	Min. 1% revenue	0.3%
Aquaculture producer (direct)	Min. 1% revenue	0.001%
Large CO2 emitter (piloted)	0,0002 USD/kwh; 0,0912 USD/ton clinker	-

Figure 6 : Financing scheme of the PES under the VNFF (source: Nguyen Chien, 2019)



The Moroccan NFF is mostly capitalized through a tax on imported wood, and other forest-related domestic sources. It is a good example of an NFF fully capitalized with domestic sources (Table 9). 90% of its capitalization is utilized for reforestation and forest ecosystems restoration. In this framework, the Moroccan NFF allocates incentives to sylvo-pastoral associations in exchange of the respect for reforestation/forest restoration perimeters, so-called

<sup>7</sup> More information about the VNFF case and PFES in Vietnam can be found under this link: <http://www.gms-eoc.org/resources/improving-payment-for-forest-ecosystem-services-implementation-ta-8592-vie>

« compensation pour mise en défens ». 10% of the fund capitalization is used to finance forestry research activities in Morocco.

Direct payments are provided to sylvo-pastoral associations. The compensation for forest protection enables direct incentivization of beneficiary groups. Sylvo-pastoral associations engage for a period defined in a contract and receive annually a compensation payment directly in the association account. The incentive amount is 27 USD/ha/year (for the argan ecosystem, the amount is 38 USD/ha/year, because of a higher opportunity cost with argan). Between 2005 and 2011, the number of beneficiaries increased to more than 14,000 from previous levels of less than 2,000; and the compensated surface increased from around 10,000 ha to more than 80,000 ha (HCEFLCD, 2014). Successful NFF operations are bound to social engineering expertise developed by the Moroccan forest administration<sup>8</sup> at all administrative levels. With this approach, foresters are trained to support the sylvo-pastoral associations to define proper sylvo-pastoral practices and to use the compensation payments for alternative income-generating activities – thus, limiting pressure on forest ecosystems.

*Table 9: Revenue sources of the Moroccan NFF, 2019 (source: adapted from Liagre, 2013)*

<b>NFF income/financial resource</b>	<b>%</b>	<b>Amount (million USD)</b>
<b>Tax on imported wood</b>	76%	58
<b>Tax on the sale of forest products</b>	12%	9.1
<b>Income from public land-wood products sales</b>	11%	8.4
<b>Other taxes</b>	1%	0.8

### 4.3. Results

The results of the analysis are presented as follows: First the role of NFFs for PES-like schemes is specified (3.1). Second, the sustainability of the intermediary role played by NFFs in PES-like schemes is analysed (3.2). Further, a more in-depth analysis of PES-like characteristics of NFFs is conducted (3.3); and finally, impacts of NFFs on biodiversity conservation are questioned (3.4).

<sup>8</sup> <http://www.eauxetforets.gov.ma/fr/index.aspx>

### 4.3.1. The role of NFFs for PES-like mechanisms

The best-known PES definition (Wunder, 2005) – later in the publication, referred to as the *Wunder PES definition* – defines PES as: “ a voluntary transaction (1) where a well-defined ES (or a land-use likely to secure that service) (2) is being ‘bought’ by a (minimum one) ES buyer (3) from a (minimum one) ES provider (4) if and only if the ES provider secures ES provision (conditionality) (5). Table 10 reports the results on how the three NFF cases studied in this paper are targeting the delivery of Ecosystem Services (ES) and if they can qualify as PES schemes. The main question asked in the survey for each characteristic is: “how far the analysed NFFs match with the *Wunder PES definition*?”.

*Table 10: PES characteristics of the Costa Rican, Moroccan and Vietnamese NFFs vis-à-vis the Wunder PES definition*

<b>PES characteristic</b>	<b>FONAFIFO</b>	<b>VNFF</b>	<b>M-NFF</b>
Voluntary transaction (1)	No (taxes systematically raised as compulsory payments)	Partially (if PES contributions are originally negotiated with economic sector branches, they become mandatory)	No (taxes systematically raised as compulsory payments)
Defined ES (2)	Yes, ES are clearly defined and come with a list of eligible activities	Yes, ES are clearly defined and come with a list of approved forest practices	Indirectly (through opportunity cost)
ES buyer (3)	Yes (citizens, corporates)	Yes (economic sectors and companies impacting forests negatively or benefitting from ES)	No
ES provider (4)	Yes (individual farmers, land owners)	Yes (individual households, local associations and cooperatives)	Yes (sylvo-pastoral associations)
Conditionality (5)	Yes (result-based payment)	Yes (result-based payment)	Yes (result-based payment)

In all cases, there is always at least one PES characteristic that is not met. Thus, it confirms that all case studies are quasi-PES or so-called PES-like schemes.



We can also deduce from these examples that NFFs can play a relevant catalytic role for PES-like mechanisms. They are indeed intermediaries between ES buyers and ES providers even though buyers may not provide payments voluntarily. The intermediary role played by NFFs is schematized in figure 7.

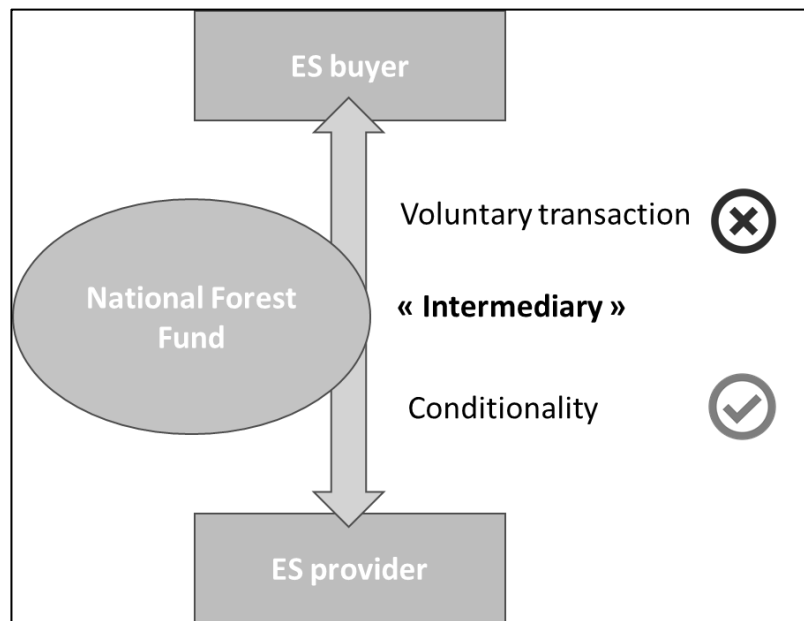


Figure 7 : NFFs as PES-like scheme "intermediaries" (source: own elaboration)

#### 4.3.2. Sustainability of the intermediary role played by NFFs in PES-like schemes

Based on the conceptual view of the intermediary role played by NFFs for PES-like schemes, presented in Figure 4, we further analysed key PES preconditions (Pettenella & al., 2018; Masiero & Pettenella, 2017) in order to provide additional understanding of the relevance and sustainability of the proposed schemes. Indeed, one could consider that if the PES preconditions are fulfilled, the NFFs are more likely to deliver on sustainable PES schemes.

The results are presented in Table 11 highlighting how each case study addresses PES preconditions, in terms of conditionality, additionality, permanence and leakage.

Table 11: Analysing PES preconditions for the 3 case studies

Pre-conditions	Definition	FONAFIFO	VNFF	M-NFF
Conditionality	Service providers are to receive payments only when their efforts to produce detectable changes reflect in the quality/quantity of the service	Yes, Result-based Payments (RBP)	Yes, RBP	Yes, RBP
Additionality	Payment should yield environmental benefits that would not have occurred without it	Changes in land use management would not take place without the payment, at least in the transition phase	Changes in land use management would not take place without the payment, at least in the transition phase	Without the payment, reforestation/ forest regeneration plots are not respected
Permanence	The scheme should be self-sustained. Uncertainties on the future provision of the ES after termination of the payment should be avoided.	Sustainable/ Permanent financing (through predictable taxes)	Sustainable/ permanent financing (through systematic annual contributions)	Sustainable/ permanent financing (through predictable taxes)
Leakage	Avoidance/ management of indirect negative effects and trade-offs occurring on the same ecosystem service or on the same ecosystem providing the service	Low risk	Low risk	Medium risk

#### 4.3.3. Specifying PES-like characteristics of NFFs

We also look in more depth into the PES-like characteristics of the three analysed NFFs case studies. Table 12 reports the results of the key features of the PES-like approaches in the FONAFIFO, the M-NFF and VNFF.

Key questions from the survey included: “(i) Is there a PES rationale in the capitalization side of the fund? (ii) Who are the funds’ beneficiaries? (iii) Are the ES well-defined in the funds’ utilization? (iv) How are the PES amounts determined? (v) Are ES generated by the funds already valorised on markets? (vi) More specifically, is REDD+ already playing a role to valorise the carbon generated through the funds?”

Table 12: PES-like approaches in the FONAFIFO, VNFF and M-NFF more in detail

	<b>FONAFIFO</b>	<b>VNFF</b>	<b>M-NFF</b>
PES rationale in the capitalization (“Demand-side PES”) (i)	Indirectly (Non-forest related taxes)	PES contributions from economic sectors and companies “polluter-pay principle” (towards ecological compensation) +” beneficiary-pay principle”	Indirectly (Forest taxes)
Beneficiaries (ii)	Payments to smallholders/individual farmers	Payments to cooperatives/associations, and to individual land owners	Payments to sylvo-pastoral associations
Clearly defined ES, with ES prioritization (“Supply-side PES”) (iii)	Yes (prioritization of ES and differentiated payment)	Indirectly through targeted ES with contributing economic sectors and operators	No
Definition of PES amounts (iv)	Total Economic Value (TEV) and/or a negotiation with beneficiaries on the Willingness to Accept (WTA)	A mix of cost of degradation, TEV, and a negotiation on the Willingness to Pay (WTP)/WTA	Opportunity cost
Valorisation of ecosystem services on markets (v)	Yes, with UCC (ecosystem services rights on carbon are retroceded to the FONAFIFO)	Indirectly through REDD+ financing	No
REDD+ valorisation (vi)	FONAFIFO plays a key role in the REDD+ implementation	A REDD+ trust fund has been created under the VNFF umbrella	No

Another interesting observation is the capacity of some of these funds to valorise ES on already established markets. For the time being only carbon has this potential. The FONAFIFO for example generates Costa Rican Carbon Units (UCC) which can be traded on a domestic voluntary market. And both the FONAFIFO and the VNFF are playing a role for REDD+ implementation. The VNFF has even created a REDD+ window through a dedicated trust fund (Nguyen Chien, 2019; Trung, 2014).

#### 4.3.4. NFFs impacts on biodiversity conservation

We also analysed the impact of the three NFFs case studies on biodiversity conservation. A quick review of how biodiversity is considered in the three case studies is presented in table 13.

*Table 13: Quick overview of biodiversity mainstreaming in the FONAFIFO, the M-NFF and the VNFF*

<b>Biodiversity mainstreaming elements</b>	<b>FONAFIFO</b>	<b>VNFF</b>	<b>M-NFF</b>
Fund addressing biodiversity relevant forest ecosystems	Yes	Yes	Yes
Fund addressing/supporting measures in protected areas	Yes	Yes	Yes
Alignment between NFF goals and NBSAP goals	Yes	Partially	Partially
Biodiversity indicators in the M&E system of the fund	Yes	No	No
Types of biodiversity-relevant indicators	-Reforestation with species threatened with extinction -Agroforestry systems with species threatened with extinction -Agroforestry systems with native species -PES contracts within biological corridors -PES contracts in protected forest areas -Reforestation in protected areas -Protection within protected forest areas	-	-

#### 4.4. Discussion

This paper aimed at identifying opportunities for NFFs to deliver better on biodiversity conservation and the provision of ecosystem services, and more specifically, to uncover the role that NFFs could play for PES approaches. This work, based on interviews with NFFs’

managers and advisors, will inform the design and/or reform process of NFFs for a better integration of ecosystem services in their operation and modalities.

If we consider the Wunder PES definition (2005), we found that all of the NFFs case studies' schemes selected for this paper comply only partially with it. Therefore, we could consider the three NFFs case studies' schemes as PES-like mechanisms, meaning that one of more key-PES criteria is missing, as specified by Masiero & Pettenella (2017). For example, in the M-NFF case, the buyer of the ES is not well-defined as taxes are raised mainly on wood importers who would not directly benefit from a domestic PES scheme. In all case studies, the transaction is not voluntary, as payments are mandatory – either through taxes (FONAFIFO and M-NFF) or through mandatory contributions from companies and operators in specific economic sectors (VNFF). In the case of the VNFF, the payments were originally defined through a negotiated process, searching for the 'willingness to accept' (WTA).

Given these characteristics, the Vietnamese case seems to be the most advanced NFF out of the three analysed in activating a PES-like scheme on the ES buyer side. In general, we can deduce from these examples that NFFs can play a relevant catalytic role for activating PES-like mechanisms. They are, indeed, intermediaries between ES buyers and ES providers even though buyers may not provide payments voluntarily. In all cases, the result-based payment ensures the conditionality of the PES-like approach.

Furthermore, analysing key PES preconditions as proposed by Masiero & Pettenella (2017) provides additional understanding on the relevance and sustainability of the proposed schemes. Among the strengths of all three models, we can point out: the permanence of the mechanisms with a self-sustaining capitalization approach, while additionality is also ensured as result-based payments are a key success factor of the delivery of ecosystem services. A grey area remains nonetheless on the leakage issue, which may not be addressed appropriately in all cases. The PES rationale in the capitalization of the fund is well defined for the VNFF, while the PES rationale on the utilization side of the fund is well defined in the FONAFIFO case only. The VNFF directly connects the economic sectors' contributions to the benefit they gain from forest resources or to the impacts they may have on forest ecosystems. Differently, the FONAFIFO and M-NFF capitalization heavily rely on taxes more indirectly connected to forest ecosystems. On the utilization side, only the FONAFIFO made efforts to prioritize ES depending on their relative importance and defined a payment grid with differentiated rates.

So, we may qualify the VNFF model as a “demand-side” PES-like scheme and the FONAFIFO as a “supply-side” PES-like mechanism, as suggested by Pagiola (2005).

Looking at these different models and recognizing the role of NFFs in catalysing the provision of ecosystem services, one can ask how impactful NFFs can be in contributing to biodiversity conservation specifically. More data would be useful to characterize this contribution, but only very limited information is available. A quick review of how biodiversity is considered in the three NFF case studies highlighted the fact that there are relevant gaps in the way NFFs integrate biodiversity in their M&E framework, limiting opportunities to unleash the potential of NFFs for biodiversity conservation. At the time this paper was written, only FONAFIFO explicitly integrated biodiversity in its M&E framework. VNFF and M-NFF address work in biodiversity-relevant forest ecosystems, including in protected areas. For example, the compensation mechanism of the M-NFF operates to protect and help the regeneration of natural cedar forests and of argan forest ecosystems. The cedar forests of the Middle Atlas region is home to the endangered barbary macaque and the Argan ecosystem is part of the Argan Biosphere Reserve.

With the ability to activate PES-like mechanisms, it is clear that NFFs have a role to play in biodiversity conservation. Nonetheless, the current lack of data on biodiversity in the M&E and reporting systems of these funds make it difficult to precisely track NFFs-related biodiversity benefits, and to fully tap into the NFFs opportunities for biodiversity conservation financing. Future research steps should also address this issue and further analyse how NFFs’ M&E systems could better embed biodiversity and ecosystem services-related indicators.

## **4.5. Policy and management orientations**

### **4.5.1. Policy and management orientations following the NFFs features**

With the previous comparative analysis on the three NFF case studies and how they can activate PES-like mechanisms, we can identify a series of policy and management orientations targeting in particular the countries willing to establish and/or reform an NFF. Table 14 compiles these orientations.

Table 14: Policy and management orientations to seize the NFF potential for biodiversity conservation and the provision of ES (non-exhaustive)

<b>Capitalization</b>	<b>Utilization</b>
<ul style="list-style-type: none"> <li>- Consider the PES approach on the demand-side.</li> <li>- Apply the polluter-pay and beneficiary-pay “principles” to mobilize economic sectors and operators with a PES rationale.</li> <li>- When relevant, mobilize taxes affected to the fund.</li> <li>- When meaningful, use the NFF for ES valorisation, including on established markets (e.g. with REDD+).</li> <li>- Develop a mixed capitalization approach to ensure self-financing and thus a permanence of the scheme.</li> </ul>	<ul style="list-style-type: none"> <li>- Consider the PES approach on the supply-side.</li> <li>- Prioritize ES and differentiate payments for an efficient use of resources.</li> <li>- Decentralize operations of the fund for a close support to local beneficiaries, and better control of ES provision.</li> <li>- Apply result-based payments approaches (RBP) to ensure conditionality of the PES approach.</li> <li>- Include biodiversity conservation activities.</li> </ul>
<b>Monitoring &amp; evaluation/Oversight</b>	<b>Governance</b>
<ul style="list-style-type: none"> <li>- Define biodiversity indicators as part of the NFF M&amp;E system.</li> <li>- Develop safeguards systems to avoid leakages.</li> <li>- Report the fund achievements as part of the reporting to the Convention on Biological Diversity (CBD).</li> </ul>	<ul style="list-style-type: none"> <li>- Take stock of positive examples of NFFs operating with PES-like approaches to mainstream the PES approach in existing NFFs.</li> <li>- Need for a good alignment between NFF goals and biodiversity conservation goals; including the goals included in the National Biodiversity Strategy and Action Plan (NBSAP), and the Forest and Landscape Restoration (FLR) strategy, etc.</li> <li>- Reinforce the dialogue between the CBD focal point and the forest administration when they are not based in the same institution.</li> <li>- Open governance processes to a variety of stakeholders (including those relevant to biodiversity): diverse sectors, the private sector, and civil society representatives.</li> </ul>

#### 4.5.2. Policy and management orientations applied to the Moroccan case

In order to capture the full potential of NFFs for biodiversity conservation and the provision of ecosystem services, it seems relevant to apply above recommendations. We have tried to identify in the Moroccan case what orientations could be appropriate to unleash the M-NFF in

delivering more PES<sup>9</sup>. Recommendations to improve the use of the M-NFF as a PES-like scheme were proposed in a study conducted in the Middle Atlas region; in particular, in the area of the Ifrane National Park and its periphery where can be found a remarkable natural cedar forest ecosystem (GIZ, 2015). Below orientations may apply to the M-NFF in general, while highlighting elements relevant for the Ifrane area (Table 15).

Table 15: Reform orientations for the M-NFF

Feature	Possible NFF reform orientations	Potential application to the M-NFF
	<b>Apply the polluter-pay and beneficiary-pay “principles” to mobilize economic sectors and operators with a PES rationale / Consider the PES approach on the demand-side</b>	Ecotourism/tourism operators may be ready to contribute to a PES scheme, as well as the water distribution operator through a water tariff. Besides local and national companies may be able to contribute, including through the Partnership for Moroccan Forests initiative (GIZ, 2015; HCEFLCD, 2014).
Capitalization	<b>When meaningful, use the NFF for ES valorisation, including on established markets (e.g. with REDD+)</b>	A cost-benefit analysis of REDD+ in Morocco showed the relevance of this mechanism, even if no REDD+ policy has been developed in Morocco so far (GIZ, 2013). The M-NFF may be a good intermediary in delivering REDD+ financing at local level as with the VNFF case.
	<b>Develop a mixed capitalization approach to ensure self-financing and thus a permanence of the scheme</b>	For the time being, the M-NFF depends mainly on a few forest-related taxes. Opening the capitalisation to corporates, non-forest taxes and international donors (like FONAFIFO for example) may be a way to secure a self-sustaining scheme.
Governance	<b>Reinforce the dialogue between the CBD focal point and the forest administration when they are not based in the same institution</b>	The Ministry of Environment in Morocco (hosting the CBD focal point) and the Forest administration (under the Ministry of Agriculture) would gain in reinforcing dialogue on how to use the M-NFF to serve biodiversity objectives (including the NBSAP objectives).
	<b>Open the governance process to a variety of stakeholders, including</b>	The M-NFF governance is closed for the time being, ensured mostly by the forest administration itself. It is critical

<sup>9</sup> It has been one of the objectives of a south-south cooperation project between Costa Rica and Morocco with GIZ facilitation. See: <https://www.giz.de/en/worldwide/28717.html>. Ludwig Liagre was in charge of the PES component as GIZ advisor.



	<b>diverse sectors, the private sector, and civil society representatives</b>	to open the governance of such a mechanism to engage more actively with the private sector and international donors, and other biodiversity-relevant stakeholders.
Utilization	<b>Consider the PES approach on the supply-side / Prioritize ES and differentiate payments for an efficient use of resources</b>	For the time being, the M-NFF and its compensation mechanism do not recognize ES per se, and they consider only two forest ecosystem types (argan ecosystems where opportunity costs are the highest and other forest ecosystems). The diversity of forest ecosystems types in Morocco (cork oak, cedar, pines, etc) to name a few could be differentiated, as well as land use types. And differentiated incentives (as in the FONAFIFO) could be applied.
	<b>Decentralize operation of the fund for a close support to local beneficiaries, and better control of ES provision</b>	Even if local foresters in Morocco provide technical assistance to the M-NFF beneficiaries groups (sylvo-pastoral associations), it could be meaningful to decentralize the M-NFF further, for example taking stock of the VNFF experience.
M&E/oversight	<b>Define biodiversity indicators as part of the NFF M&amp;E system</b>	Biodiversity indicators are lacking in the case of the M-NFF, while many biodiversity items could be monitored (aromatic and medicinal plants, animal species like the Barbary macaque in the Middle Atlas, etc).
	<b>Develop safeguards systems to avoid leakages</b>	Avoiding leakages is a common challenge of many PES schemes. Application of an integrated landscape approach may help to decrease the leakage risk. There also an open governance at local level can help this purpose.

*N.B. Orientations reported in the table are not meant to be exhaustive but illustrate how the analysis developed in this publication can serve an existing NFF in delivering more ambitious PES-like approaches.*

#### 4.6. Concluding remarks

The overall results of the paper indicate that NFFs are clearly part of the solution to channel additional financial resources to biodiversity conservation and the provision of ecosystem services. However, in order to unleash their potential for biodiversity conservation, NFFs need specific characteristics of PES-like schemes and the adoption of relevant policy and

management orientations. The present publication provides insights into how to capture this potential. For instance, alignment of the funds' objectives with national biodiversity targets is critical. Besides, it is key to consider the PES rationale – both on the ES demand and supply sides, and to ensure that PES preconditions are met, including for example through the use of result-based payments.

Further research will look with more depth into the diversity of existing NFFs in order to better assess the opportunities for these instruments to play a role in ecosystem conservation and restoration. Additional research will also question how to improve the NFF features' framework.

While the United Nations Decade on Ecosystem Restoration (2021-2030) is about to start and the post-2020 global biodiversity framework is being shaped, it seems critical to consider already established NFFs and NFFs in design as possible intermediaries of PES-like mechanisms.

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## 5. Paper II - How National Forest Funds can support small-scale forest businesses to deliver ecosystem services?

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Authors: Ludwig Liagre<sup>a</sup>, Davide Pettenella<sup>a</sup>, Alex Pra<sup>b</sup>

<sup>a</sup>TESAF Department, University of Padova, Viale dell’Università, 16, 35020 Legnaro (PD), Italy

<sup>b</sup>ETIFOR, Padova University spin-off, Piazza De Gasperi 41, 351321 Padova (PD), Italy

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### **Abstract**

National Forest Funds (NFFs) represent an increasingly relevant funding source for the forest sector at the global level. With the increasing role of these funds, their structures and operational procedures are becoming more complex and diversified. While many of these funds are State-driven and often support projects that include public goods with a focus on social and environmental benefits, some also support privately managed small-scale “for profit” businesses related to wood and non-wood forest-based value chains.

This paper describes some the recent developments of NFFs and presents the results of a research effort that analyzed how NFFs’ funding targeting small-scale forest enterprises can contribute to the provision of forest ecosystem services. For this analysis, five case studies from Costa Rica, Guatemala, Luxembourg, Portugal, and Tanzania have been selected. In specific, the Forest Financing Fund (FONAFIFO), the FONABOSQUE, the Forest and Climate Change Fund (FCCF) of Luxembourg, the Floresta Atlantica Fund, and the Tanzania Forest Fund (TaFF) are reviewed. The research addressed several key research questions, including: How are NFFs operations conceived to support small-scale forest businesses? What type of funding windows are targeting small-scale enterprises? What are the current practices of NFFs supporting ES provision through small-scale forest businesses? How could NFFs further support small-scale enterprises while unleashing contributions to the provision of ES?

## 5.1. Introduction

National Forest Funds (NFF) are defined by Matta in FAO (2015) as “dedicated financing mechanisms established with the main objective of supporting the conservation and sustainable use of forest resources”. Previous to this definition, Rosembaum & Lindsay (2001) refer to the term “national forest funds” as a “constellation of approaches”, given the very diversified forms that these financing mechanisms address depending on objectives, capitalization, beneficiaries and spending strategies. From a global perspective, NFFs hold or manage more than USD 12–13 billion worldwide (FAO, 2015) making NFFs a non-negligible source of financing for the forest sector.

While many of the NFFs are State-driven and support public goods types of projects with a focus on social and environmental benefits, some are also supporting privately managed small-scale “for profit” forestry businesses related to wood and non-wood forest-based value chains. According to FAO & GIZ (2013), NFFs differ from commercial forestry investment funds, which main objective is to provide a financial return to investors. Indeed, a majority of NFFs do not directly support commercially-viable forest activities. Nevertheless, we believe that the difference is not black-and-white and there are many shades of grey among investment funds in the forestry sector. Therefore, we also consider relevant forest investment funds which may provide important lessons learned for the future development of NFFs.

NFFs can be key instruments to mobilize financial resources from a variety of sources (e.g. domestic, international, private and public) as needed to achieve the Bonn Challenge and other national, regional and global Forest & Landscape Restoration (FLR) commitments (i.e. “at least +40 USD Billion/year needed” according to FAO-GM, 2015). By supporting small-scale forestry businesses and related value chains, NFFs could unleash the creation of green jobs and incomes for rural territories which could make FLR implementation more sustainable. Nevertheless, more private capital is needed to achieve FLR implementation at scale. In recent years, this has materialized by a multiplication of impact funds instruments. Similarly, NFFs may have a role to play if they can catalyze private financing for sustainable value chains, including through small-scale forest businesses. Such funds supporting small scale forest businesses may also be able to catalyse the provision of ecosystem services beyond generating profits and financial returns.

Consequently, a key research question that we aimed to address with this paper is: how can NFFs contribute to the provision of Ecosystem Services through the financing of small-scale forest businesses?

The research further seeks to address emerging needs regarding the role NFFs could play for the sustainable provision of Ecosystem Services (ES), in particular on: i) building more effective domestic forest financing mechanisms delivering ES (such as Payments for Ecosystem Services); ii) understanding how the utilization feature of NFFs can be more effective in delivering ES; iii) identifying relevant policy and management recommendations for NFFs supporting small-scale businesses on how to unleash ES provision; and, finally, iv) developing a revised framework for monitoring the role of forest funds on ES. More broadly, as part of this exploratory research effort, the paper aims to describe recent developments of selected NFFs and assess how NFFs' funding targeting small-scale forest enterprises can actually contribute to the effective provision of ES.

Specific key questions addressed in the present research include:

- How are NFFs operations conceived to support small-scale forest businesses? What type of funding windows are targeting small-scale enterprises?
- What is the typology of beneficiaries under the small-scale enterprises funding windows (incl. in terms of financing instruments used and underlying business models)?
- What are the current practices of NFFs supporting ES provision through small-scale forest businesses?
- How could NFFs further support small-scale enterprises while unleashing contributions to the provision of ES?

## **5.2. Material and Methods**

### **5.2.1. Methodology**

The methodological steps used in this research were composed in particular of: i) a broad literature review on NFFs; ii) identification of relevant case studies; iii) data collection through a survey submitted to NFFs case studies representatives and direct semi-structured interviews to integrate the information (full survey is presented in Appendix 1); and iv) a comparative analysis of the survey's responses helped to cross-compare selected funds, to identify lessons

learned and to produce results for the research. Covid-19 situation did not always allow for field visits but authors built on previous field work experience in target countries to add in specific knowledge on funds operations. Surveys were conducted on distance with fund managers, enabling data collection directly from stakeholders involved in the daily management of the funds.

### **5.2.2. Case studies**

The selection of the case studies was based on three main criteria: i) is the fund operational and has more than three years' experience? ii) does the fund provide financing support to small-scale forestry businesses? iii) does the fund demonstrates interest for the provision of ecosystem services?

Based on these three criteria and the review of NFFs globally, a limited number of relevant NFFs were selected: the Forest Financing Fund (FONAFIFO) in Costa Rica, the FONABOSQUE fund in Guatemala, the Floresta Atlantica Fund in Portugal, and the Tanzania Forest Fund (TaFF). In addition, we decided to include also the Luxembourg Forest and Climate Change Fund (FCCF) because it can be considered as a relevant case study highlighting how a private fund can provide lessons learned to the more traditional public-driven NFFs.

The Forest Financing Fund (FONAFIFO) in Costa Rica is supporting forest conservation, forest restoration, and agroforestry, providing direct incentives to local landowners and community groups. It is a well recognized form of a successful Payment for Ecosystem Services based on a national forest fund (Liagre & al., 2020). FONAFIFO has developed a financing window with return on investments, so called “credito forestal”.

The FONABOSQUE fund in Guatemala is a recent financing instrument aiming to increase the financial resources available to implement the national forest incentive program. FONABOSQUE official launch has been announced in 2019. It received support from the Green Development Fund of the Central American Integration System (SICA) countries. The National Forestry Institute of Guatemala (INAB) is managing FONABOSQUE.

The Forest and Climate Change Fund (FCCF) operates as a public-private partnership which provides financing for companies, communities and small farmers to manage secondary and degraded forests in the tropics. By creating the enabling environment for business models that

allow the generation of revenues, deforestation is stopped and forest growth leads to a substantial positive climate impact.

Floresta Atlântica Fund (€ 20 Million) was launched in October 2007 being its main purpose to promote sustainable forestry development through the combination of public and private initiative relying on an innovative business model (Wadewitz, 2017). The major shareholders are the Portuguese government (through the *Instituto de Financiamento da Agricultura e Pescas* with 40,5%) and five private shareholders (59,5%). The Floresta Atlantica Fund (FAF) in Portugal is a real estate investment funds, investing only in its own land properties, with potential for valorization of wood and non-wood forest products and other environmental services.

Tanzania Forest Fund (TaFF) is “a Conservation Trust Fund established by the Forest Act as a mechanism to provide long term, reliable and sustainable financial support to Forest Conservation and Sustainable Forest Management (SFM) in the Country” (TaFF website). The Tanzania Forest Fund is a Public Fund which was made operational in July 2010 as a Not-for-Profit organization governed by a Board of Trustees. The main intent of establishing the Tanzania Forest Fund is to mobilize and provide stable and long-term sources of funding for conservation and sustainable management of natural resources in Tanzania.

### **5.3. Results**

The results of the research are presented in two sections: 1) Fund models and types of support to small-scale businesses; and 2) Integration of Ecosystem Services in funds support to small businesses.

#### **5.3.1. Fund models and types of support to small-scale businesses**

Table 16 synthetically reports the answers to the survey questions: “(i) What are the types of funds used (public, private, others)? (ii) What are capitalization sources? (iii) How much funds have been spent in the last years (iv) What types of forestry small-scale businesses are supported? (v) What are the main financing instruments used?”

Table 16: Diversity of funds models and types

<b>Fund characteristics</b>	<b>FONAFIFO (Costa Rica)</b>	<b>PROBOSQUE (Guatemala)</b>	<b>FCCF (Luxembourg based)</b>	<b>Floresta Atlantica (Portugal)</b>	<b>TaFF (Tanzania)</b>
<b>Fund type (i)</b>	Public fund	Public fund	Impact investment fund (SICAV)	Public-private investment fund (real estate fund)	Public fund (Conservation trust fund)
<b>Capitalization sources (ii)</b>	Oil tax, water tariff, CSR sponsoring & offsets, International donors, loan portfolio recoveries	State contribution, international sources	State, CSR sponsoring, Banks	Public and private shareholders	Fees, levies, International & bilateral donors
<b>Funding size (spending) (iii)</b>	~ 25 M USD/year (1.6 M USD/year – Forest credit)	~ 15 M USD/year (through the forest incentive programme)	7.3 M USD (in the last 5 years). Target size: 15 M USD	20 M EUR (initial capitalization)	Not mentioned
<b>Types of small-scale forest businesses supported (iv)</b>	Wood forest businesses, incl. Plantations (upstream support)	Wood and non-wood forest businesses, incl. Plantations (upstream support)	Wood forest businesses, involved in different value chains steps of forest management wood processing (downstream support mainly)	Wood and non-wood forest businesses, e.g. nut, beekeeping, etc	Wood and Non wood forest businesses, e.g. beekeeping
<b>Financing instruments (v)</b>	Small and medium loans (Credito forestal), Micro credit	Forest incentive programme (grants and PES incentives)	Loans and equity financing	Concessions (fund remuneration with royalties) / land leasing	Grants (small, medium, large)

There is clearly a diversity of forest funds models, and types of financing support used for small-scale forest businesses.

#### **FONAFIFO (Costa Rica):**

FONAFIFO is capitalized through a mix of an oil tax, water tariffs, Corporate Social Responsibility (CSR) partnerships and international support. With a total average funding size of 25 Million USD per year it is a major source of forest finance at national level. Individual



farmers and land owners can be eligible for the Payments of Ecosystem Services (PES) incentives schemes if they meet certain conditions. A very relevant window for small scale forestry, despite a minority of the FONAFIFO funding engagement, is the so-called “credito forestal” window. Credito forestal, the Forestry Credit Program of FONAFIFO “provides a financing alternative for projects of small and medium producers of forest goods and services, under conditions of interest rates and terms appropriate to the country's forestry reality” (FONAFIFO website). Credito Forestal provides loans to forest businesses, with a diversity of sub-programs described in the table 17. Interestingly the gender approach is fostered through the sub-program “FONAFIFO at your side”.

Table 17: Description of the FONAFIFO ‘Credito Forestal’ sub-programs (derived from FONAFIFO website)

Loan sub-programs	Description	Terms & Conditions
“FONAFIFO at your side”	Financing aimed at economic development and improvement of the quality of life of rural women. Credits of up to <i>¢5,000,000.00 (in Costa Rican colón)</i> for productive development, working capital, infrastructure, purchase of equipment and innovative forest-related projects.	-Up to 10 years. -Interest: 4% per year -Warranty: Fiduciary
“Forestry Productive Development”	Financing of the following activities: forest nurseries, forest plantations, establishment, management and use of plantations, wood processing of own forest plantations, establishment and management of agroforestry systems, activities for the protection of forests, forest management (management studies of forests and their execution), recovery of denuded areas, innovative projects that optimize the use of natural resources and other activities that promote the development of the forestry sector, investment in machinery, equipment, infrastructure, purchase of inputs, labor, in activities related to the above or others that by their condition can be assessed under this objective.	-Conventional up to 20 years. -Revolving Line of Credit from 1 to 5 years -Interest: 5 to 7% per year -Warranty: Fiduciary (up to <i>¢5 million</i> ) or mortgage (more than <i>¢5 million</i> )
“Forest industry”	Financing of the following activities: Activities related to the use, transportation, primary and secondary processing of wood and non-timber goods from forest ecosystems and their commercialization. Investment in machinery, equipment, infrastructure, purchase of inputs, raw materials and labor, among others referring to the Forest Industry.	-Conventional up to 10 years. -Revolving Line of Credit from 1 to 5 years -5 to 7% interest rate
“Promoting Development”	Financing of the following activities: Infrastructure, equipment and working capital for small ecotourism ventures and other activities linked to the forest, but not necessarily related to wood.	Conventional up to 15 years. -5 to 7% interest rate
“Organizations”	Financing to those organizations that have a cooperation agreement with FONAFIFO, to act as a second-tier bank. The resources lent to the organizations will be used only to finance projects that fit into the Subprograms of Productive Development and Forest Industry, described in the present regulation.	Conventional up to 10 years. -3 % interest rate

“Micro-Forest Credit”	Microcredits up to a maximum amount of € 1,500,000.00 for the different subprograms.	-Conventional up to 3 years. -5% interest rate
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### **FONABOSQUE (Guatemala):**

In the recent years, resources allocated from the forest incentive program amounted approximately 15 Million USD annually. FONABOSQUE is made for a capitalization from a mix of domestic and international sources. No less than one percent of the state budget should support the forest incentive program (PROBOSQUE, 2015). The list of potential beneficiaries types is very broad and small-scale forest businesses only represent a limited proportion of them, such as cooperatives and SMEs.

Several of the national forest incentive program’s modalities can be meaningful for small-scale forest businesses. They include (PROBOSQUE, 2015):

- a. Projects for forest plantation establishment and maintenance projects will receive incentives for a defined time period depending on the purpose of the project. Industrial or energy projects will comprise an establishment phase of one year and up to five years of maintenance.*
- b. Projects for the establishment and maintenance of agroforestry systems, receive incentives during one year of establishment and up to five years of maintenance.*
- c. Natural forest management projects for production purposes, up to ten years support.*
- d. Natural forest management projects for protection purposes, up to ten years years support.*
- e. Projects for the restoration of degraded forests receive incentives defined according to the specific purpose of the project, with up to ten years support.*

### **FCCF (Luxembourg based):**

The FCCF is capitalized through a mix of public and private resources. The Luxembourg government as well as Luxembourgish banks such as BIL and Spuerkess have provided seed capital in the framework of their Corporate Social Responsibility (CSR) strategy. Currently the average ticket per investment is USD 1,275,000. FCCF has a target size of USD 15 Million while 7.3 Million USD have already been invested in the last 5 years. FCCF has different ways to do its investments: i) Equity: direct investments in new entities but without being the owner of the majority of the shares, ii) Loans: for working capital and industrial equipment and

machineries. The Fund has businesses operating at various stages of the value chain with differing underlying business models. Those at the earlier stages of the value chain generate revenue through timber, and the Fund hopes to improve revenue streams through the implementation of sustainable and efficient forestry management practices. Other businesses focus on wood transformation and treatment, either into higher end or lower end products. Given that the Fund works with businesses across the value chain, the Fund sees symbiotic relationships being built between the various businesses working at different ends of the value chain.

### FAF (Portugal):

The Floresta Atlantica Fund has a legal form of a real estate fund. It was built through a public private partnership approach, major shareholders being the government (Instituto de Financiamento da Agricultura e Pescas with 40,5% of shares) and five private shareholders (59,5%). More than 50% of the Fund's asset value is invested in the acquisition of property rights. FAF generates revenues through a diversity of activities (fig. 8), leasing lands for multiple purposes. Through concessions contracts, FAF gets returns with royalty payments, while it enables small-forestry businesses to operate and make profits from sustainable use of the land and/or wood and non-wood products and services.



Figure 8: Floresta Atlantica Fund investment policy: diversifying revenues from forest lands (Wadewitz, 2017)

### TaFF (Tanzania):

Concerning the Tanzania Forest Fund “[it] was made operational in July 2010 through Treasury Circular No. 4 of 2009. Section 79 (1) of the Forest Act identifies sources of funds to the Tanzania Forest Fund as a levy of two per cent of every prescribed fee payable under the Forest Act; a levy of three per cent of any royalty payable under the Act; grants, donations, bequests or such sums contributed by any private individuals, corporate bodies, foundations, or international organizations or funds within or outside the country; any sums realized by the sale of any forest produce confiscated under any of the provisions of the act; any income generated by any project financed by the Fund, due allowance being made for any necessary expenses which must be met by any such project; and any such funds acquired from various sources” (TFF, 2012). As illustrated in table 18, TaFF provides three sorts of grants, depending on the project ambition and the type of applicant, as well as an assistance offer (monetary, material and technical assistance).

Support provided to small forestry enterprises falls under the TaFF priority on “Improvement of community livelihood projects”, with the following eligible activities: Marketing of forest products; Promotion of non-wood forest products; Sustainable utilization of forest resources; Forestry related interventions; Beekeeping related activities; Education on management of forest resources”. In the TaFF call for proposals in 2020 (TaFF, 2020) beekeeping and honey processing was one of the priority themes of eligible support, highlighting how valorization of non-wood forest products is key for the TaFF.

Table 18: TaFF utilization through grants and a diversified assistance offer (TaFF, 2012)

Types of grants			Assistance types		
(i) Small Grants	(ii) Medium Grants	(iii) Large Grants	(i) Monetary assistance	(ii) Material assistance	(iii) Technical assistance
Amounts not exceeding TZS 5 million ( <i>in Tanzanian shilling</i> )	Amounts exceeding TZS 5 million up to TZS 20 million	Amounts exceeding TZS 20 million up to TZS 50 million per year	Grantees will be assisted with funds to support implementation of approved intervention	The Fund could provide required materials, tools, technology, facilities and equipment. TaFF will request the grantees to submit quotations from at least three service providers. Using the procurement procedures, service provider will be selected and hence	Tanzania Forest Fund could provide technical assistance to grantees by hiring professionals to offer the requested services

				provide the requested materials to the Grantee.	
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### 5.3.2. Integration of Ecosystem Services in funds support to small businesses

The answers to the following survey questions are reported in Table 19: “(i) What are the types of small-scale business supported by the fund (e.g., individuals, SMEs, cooperatives)? (ii) what Ecosystem Services are monitored? (iii) What social benefits are taken into account? (iv) How ES are being valorized? (v) what are ES monitoring approaches used by the Fund?”

Table 19: Funds' support to small businesses and ES

<b>Fund characteristics</b>	<b>FONAFIFO (Costa Rica)</b>	<b>FONABOSQUE (Guatemala)</b>	<b>FCCF (Luxembourg based)</b>	<b>Floresta Atlantica (Portugal)</b>	<b>TaFF (Tanzania)</b>
<b>Small scale business types (i)</b>	Private landowners, Individuals, SMEs	Cooperatives, Companies, SMEs, Individuals, Associations, NGOs	Companies, SMEs	SMEs	Individuals, SMEs, Cooperatives
<b>Types of ES monitored (environmental) (ii)</b>	Carbon, Water, Biodiversity	Carbon, Water, Biodiversity	Carbon	Carbon, Biodiversity	Biodiversity
<b>Social impacts (iii)</b>	Indigenous groups support, Community benefits	Indigenous groups support, community benefits, jobs	Employment	Employment	Community benefits
<b>ES valorization (iv)</b>	Carbon, Water, Biodiversity (incl. local carbon market); PES scheme	Carbon, Water, Biodiversity; PES scheme; Compensation for ES	Carbon (in development); FSC certification	Carbon (in development); FSC certification	Not mentioned
<b>ES monitoring approaches (v)</b>	FSC framework	FSC framework	Environmental & Social Management System (ESMS); IFC PS, FSC	FSC framework	Not mentioned

**FONAFIFO (Costa Rica):**

FONAFIFO has developed a well elaborated Payment for Ecosystem Services (PES) approach, anchored in the forestry law, through the recognition of four ecosystem services (carbon, biodiversity, water, landscape beauty). The Credito Forestal loans programmes directly contribute to sustain effectiveness of the PES scheme by providing additional support to productive activities, including for sustainable forestry and for ecotouristic activities. With the credito forestal window, FONAFIFO does not only provide incentives in the form of grants to smallholders, cooperatives and community groups, but it also secures long-term market-based solutions to forest protection and restoration.

**FONABOSQUE (Guatemala):**

FONABOSQUE through the national forest incentive programme provides support to a diversity of stakeholders and for diverse land use management options, including sustainable forest management and forest landscape restoration (FLR). Indeed, the integration of key elements from the National Forest Landscape Restoration Strategy (ENRPF) in the PROBOSQUE law makes FONABOSQUE a strong instrument to support FLR efforts at national level (IUCN, 2017). Besides the national forest incentive programme form part of the national REDD+ strategy, hence enabling valorisation of forest-related climate mitigation efforts.

**FCCF (Luxembourg):**

FCCF provides support to different types of forest businesses as described in Table 20. In the FCCF there is an Environmental and Social Management System ('ESMS'), a set of processes and practices that allows the FCCF to incorporate environmental and social considerations into its decision-making and operations. The ESMS is underpinned by an overarching environmental and social policy that describes how the FCCF will implement the ESMS and achieve its objective to identify, develop and scale business models which create economic value for secondary and degraded forests while addressing the potential adverse impacts in FCCF-financed activities.

Table 20: Typology of FCCF beneficiaries (source: interview with FCCF)

Profile	Profile 1	Profile 2	Profile 3	Profile 4
Investment approach	Investments in small and medium landowners through a company or pre-commercial entity	Investments in cooperatives and/or associations through a company or pre-commercial entity.	Direct investments in cooperatives and/or associations.	Direct investments in large companies
More in details	An organization with the capacity to organize forest management and/or value chain activities among a number of forest owners.	An organization with the capacity to organize forest management and/or value chain activities among a number of cooperatives and associations, representing communities and/or small forest owners	Direct investments into cooperatives and/or associations representing communities and/or small forest owners. These associations should have the level of professionalization required to administer the resources, organize the work and share the benefits among its associates.	Larger companies with the capacity to professionally conduct forest management and/or processing according to FCCF's requirements.

The ESMS also includes supporting tools such as environmental and social risk categorization, checklists, templates and guidance notes to assist the Fund to assess and manage environmental and social risks and enhance related positive impacts.

FCCF monitors environmental, social and financial returns. The Fund recognizes its responsibility to preserve the environment and acts in accordance with internationally recognized social standards. The ESMS is established and managed in alignment with the processes defined by the IFC Performance Standards, specifically IFC Performance Standard 1. The Fund also focuses on consistently reporting on certain impact metrics for its investors, notably: hectares of secondary and degraded forests (SDF) under management, carbon sequestered, employment generated, timber produced from SDF, value of timber produced from SDF.

### **FAF (Portugal):**

FAF is committed to apply sustainability standards, including FSC for wood forest products, and organic certifications for non-wood forest products. Selection of FAF partners and outsourcers also integrates sustainability standards and criteria. Trainings can be offered to facilitate capacity-building of FAF partners and outsourcers on sustainability standards. FAF business partners capacities to certify products is key as well as the ability to work on carbon

standards. Climate change mitigation opportunities with certification possibilities through carbon standards like VCS or Gold Standard, indeed represent an important potential future capitalization opportunity for FAF.

#### **TaFF (Tanzania):**

TaFF recognizes two categories of private sector stakeholders' beneficiaries, as mentioned in TaFF guidelines (TaFF, 2020):

i) Individuals: Individuals undertaking interventions that can lead to sustainable management of forest resources as well as environmental conservation are eligible beneficiaries. However, availability of two respected grantors shall be a prerequisite for individuals to access the funds from Tanzania Forest Fund.

ii) Local community groups, registered Civil Society Organizations and private sectors: Local community groups recognized by the grassroots government such as village/mtaa government were suggested as eligible beneficiaries. Other eligible organizations under this category include Non-Governmental Organizations, Community Based Organizations, Faith Based Organizations and private sectors which are working with local community in the target areas and have legal registration.

Biodiversity and community benefits are key focus of the TaFF even though it is not clearly defined how such benefits will be measured and monitored.

## **5.4. Discussion**

As highlighted in table 16, there is a diversity of forest funds models, and types of financing support used for small-scale forest businesses. For example, the FONAFIFO is a public fund hosted under the ministry of environment and its staff are recognized as civil servants. Similarly, the TaFF is a public organization, but registered as a conservation trust fund. This form is quite common for biodiversity funds and more than sixty conservation trust funds are currently operational (CFA, 2020). Differently the FCCF and the FAF have more private funds characteristics. The FCCF is an investment fund registered under Luxembourgish law as a SICAV, and the Floresta Atlantica Fund is a Real Estate Fund. This diversity is also reflected in the capitalization structures of the funds, some already following a blended approach. While the FCCF and FAF, as public-private structures, are well advanced to blend public and private sources, other public funds like FONAFIFO also mobilize the private sector through CSR



partnerships. TaFF mostly depends on public sources (fees, levies) and international funding. FONABOSQUE is mainly capitalized through a secured state contribution of at least one percent of the annual Guatemala's state budget.

Funding amounts vary by fund and depend partly on the funding instruments used. For example, loan financing (FCCF and Crédito Forestal) requires strict due diligence and bankability assessments which make it sometimes more difficult to spend resources than with grant financing mostly. Crédito Forestal though allows access to financing for small producers who do not have access to commercial banks, under favorable conditions, simple requirements and without administrative expenses.

Types of supported small-scale forest businesses also vary significantly from a fund to another. While the FONAFIFO and FONABOSQUE can finance the upstream part of forestry activities (plantations, natural regeneration, conservation), the FCCF can work on both ends, with significant positive impacts on the downstream part of forest activities (e.g. wood processing and transformation). From the analyzed case studies, only the TaFF and the FAF explicitly support both wood and non-wood forest products. The FAF models enables a diversity of local companies to manage and valorize local resources including NWFPs such as mushrooms and aromatic plants. TaFF also support NWFPs business activities, for example with beekeeping.

Financing instruments used are also very different. While the FAF mostly operates with a concession approach (enabling concessions holders to conduct certain wood and non-wood related business activities), other funds mostly provide loans and equity (FCCF) or grants (TaFF). Funding instruments used by the funds have a very important role on the types of projects and beneficiaries that can be mobilized and supported. Funding instruments used also have a direct impact on the delivery of ecosystem services. For example, equity financing is very much needed to match with the long termism of sustainable forestry projects. As stated by a FCCF representative: *“Ecosystem services are most pertinent at the forest management end of the value chain – even though a good understanding is required at each step of the process. Although working capital loans may be a necessity, equity investments allow for a longer-term development of forestry ecosystems” (FCCF quote).*

These cases highlight that none of the funds has a strategy and the ability to finance all aspects of the forestry activities for SFM and forest restoration. Comprehensive financing approaches for the forest sector thus may require more agile and flexible financing instruments, potentially structured as a combination of several financing vehicles. For example, one fund could host

under one umbrella several funding windows such as a conservation trust fund, an investment fund, a technical assistance facility, a small-medium loan facility, a PES window, etc, as illustrated in figure 9. This could allow financing and investment in several parts of the value chains, thus building in the necessary flexibility required to support SMEs with diverse realities (Boscolo & al. 2010). Such a “all-in-one” fund structuration approach, despite interesting as a concept, is not necessarily easy to operate and a relevant approach may also rely on more coordination and cooperation between existing funds at landscape level. For example, in Latin American and Caribbean countries, one could imagine cooperation between the FCCF and national public forest funds, such as FONAFIFO, FONABOSQUE and other existing funds.

A diversity of Ecosystem Services (ES) is monitored in the analyzed fund cases. But only FONAFIFO and FONABOSQUE monitor and incentivize more than two ES, namely carbon, biodiversity, and water. In total, FONAFIFO recognizes four ecosystem services as included in the Costa Rican forestry law: carbon, biodiversity, water, landscape beauty. TaFF explicitly integrates biodiversity benefits as an important impact, while FAF recognizes both carbon and biodiversity.

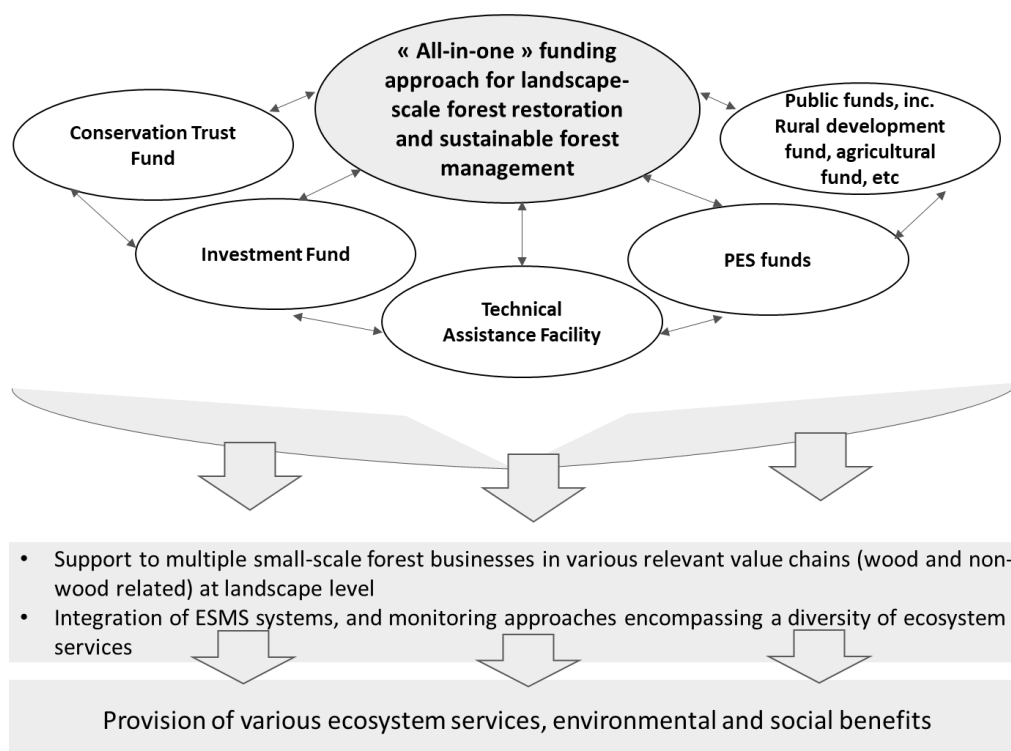


Figure 9: Importance of landscape-scale coordination between funds

As an investment fund, FCCF mostly has a risk-based approach vis-à-vis ES provision, and it applies the IFC performance standards. In this context only FCCF and FAF have an

Environmental and Social Management System (ESMS) in place, which is a good practice that could be replicated by more forest funds, in particular public forest funds.

In the present situation though only FONAFIFO and FONABOSQUE have a Payment for Ecosystem Services (PES) approach in place (among the analyzed case studies). As pointed out by Liagre & al. (2020), national forest funds can operate as PES-like schemes, sometimes requiring adaptations in their ways to utilize resources. Private forestry funds may thus benefit from developing more proactive PES-like approaches which may in turn help in developing alternative revenue streams for example through water payments, CSR partnerships, carbon revenues, REDD+ financing, etc (fig. 10).

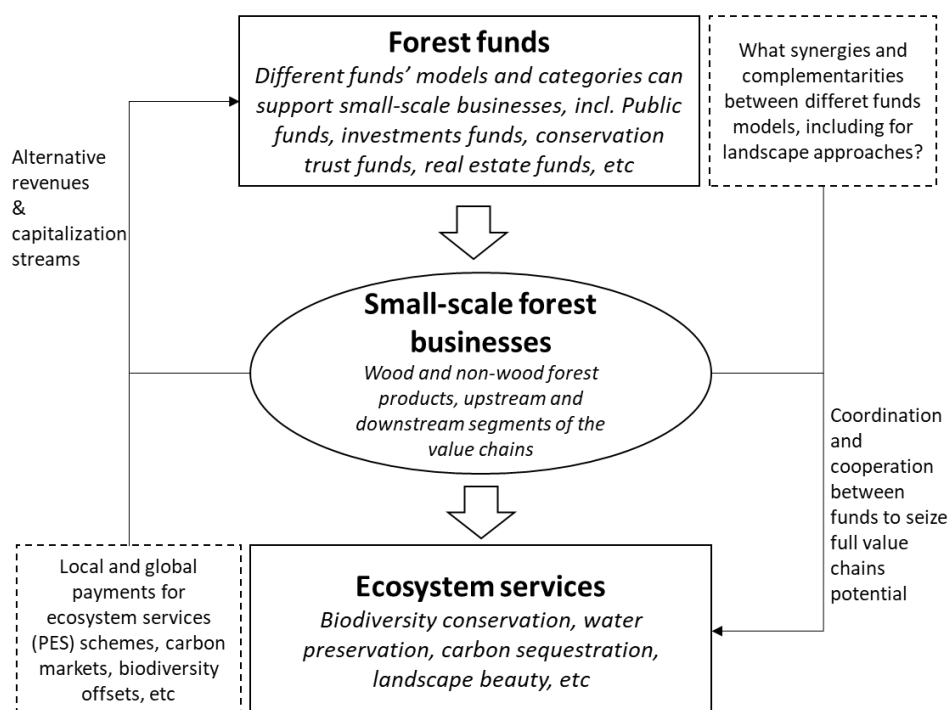


Figure 10: Forest funds & small-scale businesses: the ecosystem services rationale

Based on this analysis, a number of policy recommendations could be developed to support forest funds managers in working more effectively with small-scale forest businesses, while supporting the provision of ecosystem services. These may include, among others:

- Integrating systematically ESMS systems, thus building better E&S risks management approaches;
- Proactively supporting the provision of ES through the development of PES or PES-like mechanisms;

- Designing support to the upstream and downstream segments of value chains, including for wood and non-wood forest products;
- Advancing on the valorization of ES, including with carbon markets, payments for water services, sustainability certification such as FSC and organic certifications;
- Fostering adoption of a diversity of financing instruments such as grants, loans, equity and guarantees, in order to adapt to the diversity of small business types;
- Innovating to foster landscape-scale funding solutions, thus increasing the level of coordination with landscape stakeholders, and seeking for synergies with the diverse funding sources available.

## **5.5. Concluding remarks**

This exploratory research uncovers some of the key linkages between forest funds, small-scale forest businesses and the provision of ecosystem services. While the rationale for forest funds to operate through their windows for forestry SMEs to deliver ecosystem services is demonstrated, there are still a number of remaining knowledge gaps and pending questions. Further research could seek for example to analyze additional NFFs and to develop a comprehensive framework for assessing how NFFs support small-scale enterprises in delivering ecosystem services. Also risk mitigation approaches could be further assessed as important drivers for increased financing in forest SMEs and the provision of ecosystem services (IIED, 2018; FAO, 2016).

As pointed out in this paper, landscape-scale funding solutions are critical, notably to achieve some of the ambitious ecosystem restoration targets, including in the context of the United Nations Decade on Ecosystem Restoration. Further research will thus also investigate governance models within funds and between funds, in particular at landscape levels, enabling increased outcomes in terms of ecosystem services. Additional external drivers will also have to be considered carefully so that NFFs can unleash their potential to multiple global challenges such as climate change, post Covid-19 recovery and the necessary development of a bioeconomy.

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## 6. Paper III - How National Climate Funds can catalyse financing for Nature-based Solutions?

Being submitted to the Nature-based Solutions Journal<sup>10</sup>.

Authors: Ludwig Liagre<sup>1</sup>, Prof. Davide Pettenella<sup>2</sup>, Laura Atondeh<sup>3</sup>

<sup>1</sup> PhD candidate at the Department of Land, Environment, Agriculture and Forestry of the University of Padova, Italy

<sup>2</sup> Professor of Forest Policy and Economics - Department of Land, Environment, Agriculture and Forestry of the University of Padova, Italy

<sup>3</sup> MSc programme "Public policies and environmental strategies", AgroParisTech, Paris-Saclay University, France

### Abstract

National Climate Funds (NCFs) are defined as "*important tools that countries can develop to manage funding for climate change adaptation and mitigation*" (UNDP, 2012). NCFs are domestic funds supervised by national governments, with the aim to enable countries to mobilize funds from a variety of sources, coordinate them, pool them together and report on their use as appropriate and in accordance with national capacities. "*In this way, countries keep control over resources mobilization and can make informed choices to direct funding to activities that produce results on the ground.*" (UNDP, 2012). Thus, NCFs are relevant funding instruments to reinforce country ownership for successful climate action financing.

NCFs are generally multisectoral and thus serve multiple sectoral objectives which can be very appropriate to support financing for Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) implementation. Many of these funds already finance Nature-based Solutions (NBS) including through targeted support to the sustainable land use sector, encompassing biodiversity conservation, climate-smart agriculture, agroforestry, land degradation neutrality, ecosystem-based adaptation, wood and non-wood forest-based value chains, to name a few. After years of NCFs experiences, the paper seeks to understand what are the development of these tools, the relevant practices and the opportunities they represent for NBS.

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<sup>10</sup> <https://www.journals.elsevier.com/nature-based-solutions>

The proposed paper is composed of three main sections and will build on NCFs case studies including, but not limited to : the Bangladesh Climate Resilience Fund, the Benin National Fund for the Environment and Climate Change (FNEC), the Mali Climate Fund, and the Rwanda’s Green Fund (FONERWA), among others.

First the analysis uncovers the diversity NCFs ways to operate and secondly it draws attention on how financing support can be provided to NBS through NCFs, with particular focus given to forest-related NBS In the discussion the paper highlights good practices of NBS financing which could be mainstreamed in NCFs. Finally, it elaborates on how NCFs are essential tools for sound landscape approaches, which is of high importance for NBS as we enter the UN Decade on Ecosystem Restoration. Indeed, many NCFs could serve in implementing the ambitious pledges made in several forest and landscape restoration initiatives such as the Bonn Challenge, AFR100, 20x20, ECCA30 and the Agadir Commitment.

Some of the key questions addressed will include: How existing NCFs support Nature-based Solutions? What added value do NCFs bring in financing Nature-based Solutions? What are good practices of NCFs funding for NBS? How NCFs can enhance landscape approaches promoting Nature-based Solutions for effective ecosystem restoration?

## **6.1. Introduction**

The concept of Nature-based Solutions (NBS) emerged at the 2009 United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties (COP) in Copenhagen and at the initiative of the International Union for Conservation of Nature (IUCN, 2016). The latter defines NBS as “*actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits.*” According to IUCN (2016) again the main objective of Nature-based Solutions is “*to support the achievement of society’s development goals and safeguard human well-being in ways that reflect cultural and societal values and enhance the resilience of ecosystems, their capacity for renewal and the provision of services*”. More specifically Nature-based Solutions “*are designed to address [...] challenges, such as*

*food security, climate change, water security, human health, disaster risk, social and economic development”.*

In the field of climate action, NBS have often been referred to as “*Nature-based Solutions to climate change*”, playing a key role for both adaptation and mitigation, with tightly connected concepts such as Natural Climate Solutions (NCS), Ecosystem-based Adaptation (EbA), Ecosystem-based Disaster Risk Reduction (Eco-DRR), Climate-Smart Agriculture (CSA), Land Degradation Neutrality (LDN). Indeed, NBS can build resilience to multiple climate hazards (WRI, 2019), and they also represent important drivers of mitigation benefits. For example, New Forests and Ceres (2021) assess that NCS could remove globally approximately 25 to 30% of annual greenhouse gas emissions by 2030. But finds for NBS are still insufficient. UNEP and al. (2019) have estimated the funding gaps for NBS. According to their analysis investments needed for NBS would have to be multiplied by three by 2030 and by four by 2050 to reach close to USD 536 Billion per year.

National Climate Funds (NCFs) are defined as “*important tools that countries can develop to manage funding for climate change adaptation and mitigation*” (UNDP, 2012). NCFs are domestic funds supervised by national governments, with the aim to enable countries to mobilize funds from a variety of sources, coordinate them, pool them together and report on their use as appropriate and in accordance with national capacities. “*In this way, countries keep control over resources mobilization and can make informed choices to direct funding to activities that produce results on the ground*” (UNDP, 2012). Thus, NCFs are relevant funding instruments to reinforce country ownership for successful climate action financing. Moreover NCFs are generally multisectoral and serve multiple sectoral objectives which can be appropriate to support financing for Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) implementation.

The present article seeks to uncover the possible role that National Climate Funds (NCFs) could play in mobilizing financing for NBS. The paper questions how NCFs are currently equipped to finance NBS and identifies potential options for improvement in the future. Key questions addressed include: How existing NCFs support Nature-based Solutions? What added value do NCFs bring in financing Nature-based Solutions? What are good practices of NCFs funding for NBS? How NCFs can enhance landscape approaches promoting Nature-based Solutions and possibly build on other domestic mechanisms such as National Forest Funds?



## 6.2. Material and methods

### 6.2.1. Methodology

The methodological steps used in this research were composed in particular of: i) a broad literature review on NCFs; ii) identification of relevant case studies; iii) data collection through a desk review, complemented by direct engagement with some fund managers; and iv) a comparative analysis that helped to cross-compare selected funds, to identify lessons learned and to produce results for the research. Covid-19 situation did not allow for field visits but authors built on previous field work experience in some of the target countries to add in specific knowledge on funds operations.

### 6.2.2. Case studies

The selection of the case studies was based on three main criteria: i) is or was the fund operational and has or had more than three years' experience? ii) does the fund already finance nature-based solutions and/or demonstrate interest for the provision of ecosystem services? iii) if not, would the fund have the potential to integrate NBS in the future?

Based on these criteria and the review of NCFs globally, NCFs case studies presented in the following were selected.

The **Bangladesh Climate Resilient Fund (BCCRF)** was established in 2010 with the signing of a Memorandum of Understanding (MoU) between the Government of Bangladesh, development partners and the World Bank. The BCCRF aimed to support the implementation of the Bangladesh Climate Change Strategy and Action Plan (BCCRF, 2016), focusing on six main pillars: food security, social security and health; disaster risk management; climate-resilient infrastructure development; research and knowledge management; mitigation and low-carbon development; and capacity building. The BCCRF was owned and managed by the Ministry of Environment and Forests on behalf of the Government of Bangladesh, and the World Bank provided fiduciary management. The fund's capitalisation relied mainly on international funding partners such as European Union and the United States Agency for International Development. The fund closed in 2017.

The **National Environment and Climate Fund (FNEC) in Benin** was created in 2000 as the National Fund to Combat Desertification that further became the National Environment and Climate Fund (FNEC) in 2017<sup>11</sup>. The objectives of the FNEC are to increase funding for the environment and climate sectors, to optimise the financing of environmental and climate initiatives, and to strengthen the capacities of the various national stakeholders in the environment and climate sectors. The FNEC is a public institution under the authority of the Ministry for the Living Environment and Sustainable Development. The fund's capitalisation relies on national and international sources.

The **Green Municipal Fund (GMF)** in Canada was created in 2010 by the Federation of Canadian Municipalities. The GMF aims to support municipalities in their sustainable development projects and helps them take action to improve water quality, reduce air and water pollution, expand recycling systems, minimize waste, create energy-efficient transit, restore contaminated land<sup>12</sup>. The fund is hosted by the Federation of Canadian Municipalities and is capitalised through national public funding. It has a local and multi-sectoral approach and finances both the public and private sectors.

The **Climate Resilience Green Economy (CRGE) Facility in Ethiopia** was established in 2012 by the Ministry of Finance, in collaboration with the Environment, Forestry and Climate Change Commission. The CRGE Facility aims to attract climate finance to support the institutional strengthening and implementation of Ethiopia's Climate Resilience and Green Economy Strategy (CRGE). The facility helps to mobilise finance and to channel it towards actions that promote low-carbon green growth. The fund's capitalisation is based on national and international sources. The facility has two accounts: the Facility Account and the International Account, the latter being managed by the United Nations Development Programme Multi-Partner Trust Fund (UNDP MPTF).

The **Mali Climate Fund (MCF)** was created in 2012, when a Memorandum of Understanding was signed between the Government of the Republic of Mali and the UNDP MPTF office. The Mali Climate Fund aims to enable the implementation of the country's strategic climate framework. It is *"an essential tool for mobilising, accessing, sequencing and combining domestic and international, public and private sources of finance for priority actions aimed at achieving Mali's ambitious goal of a Green and Climate Resilient Economy"*. The MCF is hosted by the Agency for Environment and Sustainable Development, a national public

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<sup>11</sup> <https://www.fnec-benin.org/>

<sup>12</sup> <https://greenmunicipalfund.ca/>

institution under the Ministry of Environment and Sanitation. Fiduciary management is ensured by UNDP-MPTF. The fund's capitalisation relies on international sources (Norway and Sweden mostly).

The **Non-Conventional Energy and Efficient Energy Management Fund (FENOGE)** in Colombia was established in 2014. It was set up to finance Non-Conventional Energy Sources and Energy Efficiency programmes<sup>13</sup>. The objective is to reduce greenhouse gas emissions by 2022 through the program activities and the development of non-conventional renewable energy, which will also ensure the diversification of energy supply sources and the competitiveness of the Colombian economy. The fund is owned by the Ministry of Mines and Energy and its sources of funding are based on energy taxes and other national resources, but the fund can also benefit from resources from private entities, international organisations, investment funds, and donations. The fiduciary management is operated by an independent company.

The **Jordan Environmental Fund (JEF)** “*was established in 2009 under the provisions of the Ministry of Environment's Environmental Protection Law, with a mandate to help Jordan achieve its national environmental protection and sustainable development goals*” (GGGI, 2019). The Ministry of Environment plans to use the JEF as a catalytic tool (especially for the private sector) to extend funding to environmental and sustainable natural resource management projects. The three priority areas identified are: air and water pollution, hazardous waste management, and biodiversity protection and combating desertification. The sources of funding are mainly national resources (taxes, fees, fines related to the environment, and government contributions etc.) but also international resources (e.g., United States Agency for International Development, GIZ, UNDP among others).

The **Mongolia Green Finance Corporation (MGFC)** is an initiative of a public-private partnership between the Mongolian Bankers Association and the Ministries of Finance and Environment and Tourism. The fund aims to provide local commercial banks with access to climate finance, including international finance, to reach the retail market. The fund aims to finance projects that reduce carbon emissions and air pollution in Mongolia. Specifically, the MGFC's financial products will directly support NDC's objective of implementing advanced technologies in energy production through the provision of affordable financing for: (i)

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<sup>13</sup> <https://fenoge.com/>

thermoretrofitting solutions of existing houses; (ii) energy efficiency measures of energy intensive users; and (iii) green mortgages.

The **Environmental Investment Fund (EIF) in Namibia** was established by the Environmental Investment Fund of Namibia Act 2001 and was officially launched in 2012. The objective of the Fund is to raise financial resources for direct investment in environmental protection and natural resource management activities and projects that support sustainable economic development in Namibia. Four priority funding areas have been identified: i) Natural resource management and use, ii) Green technologies, low carbon development and climate change adaptation and mitigation, iii) Tourism development, iv) Research, training and capacity development. The capitalisation model relies on both domestic resources (environmental taxes) and international sources (GCF, development partners). Projects and programmes are financed mainly through concessional loans, but also through grants.

The **Rwanda Green Fund (FONERWA)** was established by the Rwandan government in 2012 as an environment and climate change fund that aims to finance green growth in Rwanda<sup>14</sup>. The fund provides technical and financial support to public and private projects that are aligned with Rwanda's green economy objectives, using a cross-sectoral approach. The priority areas of intervention of the fund are: i) Conservation and sustainable management of natural resources, ii) Research and development and technology transfer and deployment, iii) Environment and climate change mainstreaming, iv) Monitoring and implementation of environmental impact assessments.

The **National Forestry Financing Fund (FONAFIFO)** in Costa Rica was created in 1996. FONAFIFO's objective is to finance forest conservation and restoration through small and medium forest producers. In particular, the fund promotes: *“forest management, intervened or not, the process of afforestation, reforestation, forest nurseries, agroforestry systems, recovery of denuded areas and technological changes in the use and industrialization of forest resources”*<sup>15</sup> (Forest Law N°7575, article 46). FONAFIFO is a semi-autonomous agency governed by public and private representatives, which finances producers according to payments for ecosystem services (PES) approach (Jaramillo, 2014). Landowners can access the PES system if they respect specific criteria in sustainable forest management.

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<sup>14</sup> <http://www.fonerwa.org/about>

<sup>15</sup> <https://www.fonafifo.go.cr/en/>

### **6.3. Results**

Results will be presented in relation to two aspects: the main elements of differentiation of the National Climate Funds models and the specific financial tools to support to Nature-Based Solutions activated by the Funds.

#### **6.3.1. Diversity of National Climate Funds models**

Table 1 highlights some of the key characteristics of the NCFs analyzed in this study. The main elements that are differentiating the Funds are the following and these elements are presented in a summary through table 21:

i) the main host institution of the fund ii) the priority sectors financed by the fund iii) focus of the fund contributions to adaptation to climate change and/or mitigation of climate change, iv) the governance approach of the fund (an open governance is generally characterized by broad participation of diverse stakeholders, including from diverse ministries, the civil society and the private sector), v) application of an external audit, vi) the financing instruments used (which may be composed of several instruments such as grants, loans, equity and others), vii) role to mobilize private sector investments and/or finance private sector stakeholders viii) accreditation or direct access to a global climate fund, such as the Green Climate Fund (GCF) or/and the Adaptation Fund ix) international resources mobilized by the fund x) domestic resources mobilized by the fund, in particular from national fiscality xi) carbon valorization as a way to mobilize resources for the fun.

Table 21: Key funds' main elements of differentiation

<b>Fund</b>	<b>BCCRF (Bangladesh)</b>	<b>FNEC (Benin)</b>	<b>GMF (Canada)</b>	<b>FENOGE (Colombia)</b>	<b>CRGE (Ethiopia)</b>	<b>MCF (Mali)</b>	<b>JEF (Jordan)</b>	<b>MGFC (Mongolia)</b>	<b>EIF (Namibia)</b>	<b>FONERWA (Rwanda)</b>	<b>FONAFIFO (Costa Rica)</b>
<b>i.Fiduciary / Trustee Management</b>	World Bank	Ministry of Sustainable Development	GMF	Ministry of Mines and Energy	Ministry of Environment and UNDP	UNDP	Ministry of Environment	Xac Bank	Ministry of Finance + Ministry of Environment and Tourism	Ministry of Environment and Natural Resources	Ministry
<b>ii.Priority sector(s)</b>	Low-carbon development; Food security	Waste management ; Pollution control	Renewable energy, energy efficiency; Water management; Waste management Waste Management ; Sustainable Transport	Renewable energy and energy efficiency	Agriculture and Forestry ; Renewable Energy ; Sustainable Transport	Agriculture and forestry; Renewable energy and energy efficiency; Water management Water Management ;	Pollution Control; Waste Management; Biodiversity Conservation	Renewable energy and energy efficiency; low-carbon housing; waste management	Biodiversity Conservation; Sustainable Land Management	Sustainable land management; Ecosystem conservation; Renewable energy and energy efficiency; Sustainable transport	Forest, Biodiversity, Water
<b>iii.Contributions to adaptation and/or mitigation</b>	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation	Adaptation and Mitigation
<b>iv.Governance</b>	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open	Open
<b>v.External audit</b>	N.A..	Yes	Yes	Internal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>vi.Financing instruments</b>	Donations	Donations	Grants, Loans (mainly)	Loans	Grants, Loans, Equity	Donations	Donations	Loans, Equity	Loans mainly + Donations	Grants + repayable grants	PES incentives, Grants, small loans
<b>vii.Catalytic function for the private sector</b>	N.M.	N.M.	N.M.	Yes	Yes	N.M.	Yes	Yes	N.M.	N.M.	Yes
<b>viii.Accreditation to GCF and/or other climate funds</b>	No	Accreditation to GCF and Adaptation Fund	No	No	GCF accreditation	No	No	GCF accreditation (via XacBank)	Accreditation to GCF and Adaptation Fund	Accreditation to GCF (via MINIRENA)	No (but mobilized GCF funding)
<b>ix..International sources</b>	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<b>x.Domestic tax sources</b>	No	Yes	Yes	Yes	No	No	Yes	No	Yes	Not at present, but under consideration	Yes
<b>xi.Carbon valorization</b>	N.M.	N.M.	N.M.	N.M.	Yes	Yes (via forest carbon)	N.M.	N.M.	N.M.	N.M.	Yes

### 6.3.2. Diversity of support to Nature-Based Solutions

In order to dispose of a more precise view of how the analyzed funds support NBS, key questions were addressed for each analyzed fund, in particular: i) does the fund support any NBS? ii) what are the main NBS that the fund finance? ii) what types of financing instruments the funds use for NBS? iii) are the funds engaged in a Payment for Ecosystem Services (PES) approach?

Table 22: Funds' contributions to NBS

<b>Funds</b>	<b>NBS integration (yes/no)</b>	<b>More details on NBS supported</b>	<b>Types of financing instruments used for NBS</b>	<b>PES approach</b>
<b>Bangladesh Climate Resilient Fund (BCCRF)</b>	Yes	The Climate Resilient Participatory Afforestation and Reforestation Project (CRPARP) was one of the fund's projects. The objective of the CRPARP was to reduce forest degradation and increase forest coverage in Bangladesh.	Grants (not specific to NBS projects)	No
<b>National Environment and Climate Fund (FNEC) - Benin</b>	Yes	<ul style="list-style-type: none"> <li>• Environment /Ecotourism<sup>16</sup>: Creation of wildlife reserves; Restoration of endangered species (flora); Restoration of forests</li> <li>• Climate change adaptation/coastal zone: Protection of the coastal zone from sea level rise/coastal erosion</li> <li>• Land Use Change and Forestry: Promotion of sustainable management of natural forests to increase the carbon sequestration capacity of forest ecosystems.</li> </ul>	Grants (not specific to NbS projects)	No
<b>Green Municipal Fund (GMF) – Canada</b>	No	N.R.	N.R.	N.R.

<sup>16</sup> <https://www.fnec-benin.org/docs/recueil-guide-eligibility-fnec.pdf>

<b>Climate Resilience Green Economy (CRGE) Facility, Ethiopia</b>	Yes	One of the four CRGE pillars is relevant to NBS: “ <i>Forestry: Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks</i> ”	N.M.	No
<b>Mali Climate Fund (MCF)</b>	Yes	Projects financed by the fund include projects to restore and conserve forest ecosystems, improve ecosystem resilience, conserve and restore agricultural land, etc.	Grants (Not Specific to NBS projects)	.No
<b>Non-Conventional Energy and Efficient Energy Management Fund (FENOGE), Colombia</b>	No	N.R.	N.R.	N.R.
<b>Jordan Environmental Fund (JEF)</b>	Yes	Projects include tree planting and sustainable forest rehabilitation. <sup>17</sup>	Not specified	No
<b>Mongolia Green Finance Corporation (MGFC)</b>	No	N.R.	N.R.	N.R.
<b>Environmental Investment Fund (Namibia)</b>	Yes	EIF finances NBS relevant projects, such as: Namibian Community-based Natural Resource Management Enhanced Direct Access Pilot project <sup>18</sup> : supporting communal conservancies and community forests in the rural communal areas of Namibia; Community Based Gardening and Agricultural Skills Training Project; Ecosystem-based Adaptation projects; Support to biodiversity-relevant businesses	Grants + Loans (Not specific to NBS)	No
<b>Rwanda’s green fund (FONERWA)</b>	Yes	Conservation and Sustainable Management of Natural Resources <sup>19</sup> : Ecosystem Rehabilitation; Sustainable Land Management; Sustainable Forest Management; Promotion and Protection of Biodiversity.	Grants (Not specific to NBS)	No
<b>Forest Financing Fund (FONAFIFO), Costa Rica</b>	Yes	Forest ecosystem conservation and restoration, biodiversity conservation, agroforestry.	Incentives, grants, loans ( <i>credito forestal</i> )	Yes

N.R. Not relevant, N. M. Not mentioned

<sup>17</sup> [http://moenv.gov.jo/EN/Pages/Protect\\_the\\_Environment](http://moenv.gov.jo/EN/Pages/Protect_the_Environment)

<sup>18</sup> <https://www.eif.org/na/>

<sup>19</sup> <http://www.fonerwa.org/about>



## 6.4. Discussion

It appears from the analysis that NBS are already included in several NCFs. Nonetheless some do not include at all any NBS as part of their priority sectors and activities. Among the analysed funds FENOGE (Colombia), GMF (Canada) and MGFC (Mongolia) do not integrate NBS while they surely could do so. For example, FENOGE may integrate biomass energy as an alternative energy source, GMF could support nature-based solutions in cities as promoted by the G20 (2021) and the MGFC may also finance sustainable land use sectors such as climate-smart agriculture and sustainable forestry.

Among the funds that incorporated NBS, one can observe very different thematic entry points and priorities. This is clearly linked to the main climate focus of the funds. Those concentrating on adaptation like the BCCRF tend to promote NBS as a key for resilience. Those promoting also mitigation benefits will seek to maximize GHG emissions reductions through afforestation and reforestation projects for example the CRGE (Ethiopia), FNEC (Benin), FONFAFIFO (Costa Rica) and MCF (Mali).

Some funds already strongly connect social issues with climate goals, for example thanks to activities related to community projects like in Namibia promoting Community-based Natural Resource Management. Similarly, FONAFIFO already supports projects from autochthonous groups with direct incentives provided to local communities and individual landowners.

The topic of synergies between the three Rio Conventions, namely the Convention on Biological Diversity, the United Nations Convention on Climate Change, and the United Nations Convention on Combating Desertification, also seems to emerge in several funds, for example in the FONERWA (Rwanda) and FNEC (Benin), supporting activities related to biodiversity, climate and land. Indeed, finding ways to avoid the siloed processes of the Rio conventions is often referred to as an important work area for all stakeholders supporting their implementation<sup>20</sup>, as pointed out in the statements made by the Joint Liaison Group of these conventions. NCFs surely have a role to play in catalyzing more synergies between them.

In terms of capitalization approach, there is a diversity in the ways funds mobilize resources. While most of the funds are attracting international contributions (from development partners),

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<sup>20</sup> <https://www.cbd.int/2011-2020/actors/jlg>

few are already mobilizing domestic sources of funds such as (eco)taxes. Several funds have achieved to get direct access to international climate funds such as the Green Climate Fund (GCF) and the Adaptation Fund (AF). Both international climate funds (GCF and AF) offer the possibility for financial institutions like NCFs meeting eligibility criteria and standards to access directly their resources (without depending on an international or regional accredited entity). A NCF can then potentially become a national accredited entity to the GCF and/or a national implementing entity to the AF. Such direct access opportunities offer a significant resource mobilization potential for NCFs and could be considered as a good practice for any NCF in developing countries context. GCF and AF ability to finance NBS-related sectors is important. For example, “Forests and land use” and “Ecosystems and ecosystem services” are part of the key result areas of the GCF. Similarly, the AF puts a lot of emphasis on impacts related to Ecosystem-based Adaptation and Land Degradation Neutrality among other NBS-relevant topics.

In terms of PES approach, only the FONAFIFO has adopted one, which can be seen as a missed opportunity for other funds. As highlighted by Liagre et al. (2020), it appears that a PES rationale in funds operating on NBS can help increase resources mobilization by attracting economic sectors depending on the provision of ecosystem services (users external to the forest sector willing to pay for some water, tourism, biodiversity-related services). It can also support a more efficient use of resources through the allocation of incentives that can be differentiated based on the relative importance and cost-benefit ratios of NBS (Liagre et al., 2020). NCFs supporting NBS may thus benefit from the integration of a PES approach, which besides enables to support directly local beneficiaries (local landowners and communities, small farmers, cooperatives, etc).

IUCN (2020) promotes NBS being integrated in a landscape approach, which tends to foster intersectoral coordination at the jurisdictional level, while maximizing the provision of ecosystem services from multiple NBS. A general observation is that none of the NCFs analyzed is currently directly supporting such a landscape approach. Climate action and landscape approaches can function well together as both address coordinated efforts by multiple sectors. In this sense it may be beneficial for NCFs to anchor more their activities within landscape approaches, which could turn positive for enhanced NBS impacts.

In the selected NCFs relevant to NBS one can observe that the forest based NBS are well represented. When other domestic funds exist at country level focusing on forest ecosystems, such as national forest funds (NFFs), one can question the possible linkages that could exist

between NFFs and NCFs.

For example in the case of the Vietnamese National Forest Fund (VNFF), climate finance was channelled through a dedicated window under the supervision of the VNFF ('REDD+ trust fund'). But in other contexts where both NCFs and NFFs cohabit, and where NFFs are managed in a traditional way (under a

limited number of ministries, with a closed governance), it can be advised

that the NFF play a financial intermediary role for NBS, while the NCF will concentrate on climate finance mobilization (fig. 11).

Based on the orientations captured in the discussion, figure 12 highlights key recommendations to NCFs managers and policy makers in order to maximize their possible role for NBS financing.

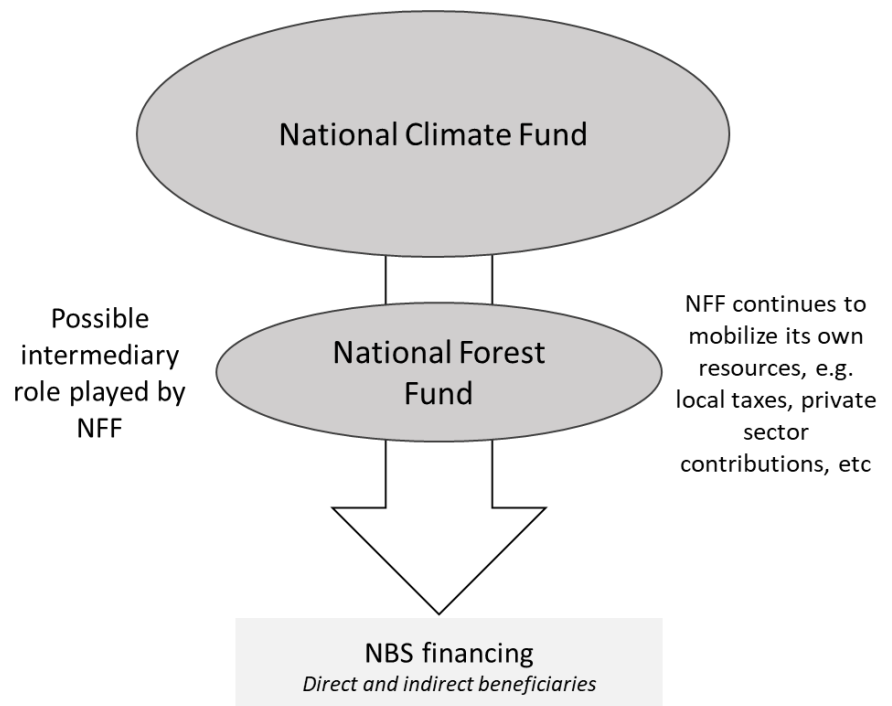


Figure 11: Possible financing intermediary role played by NFFs

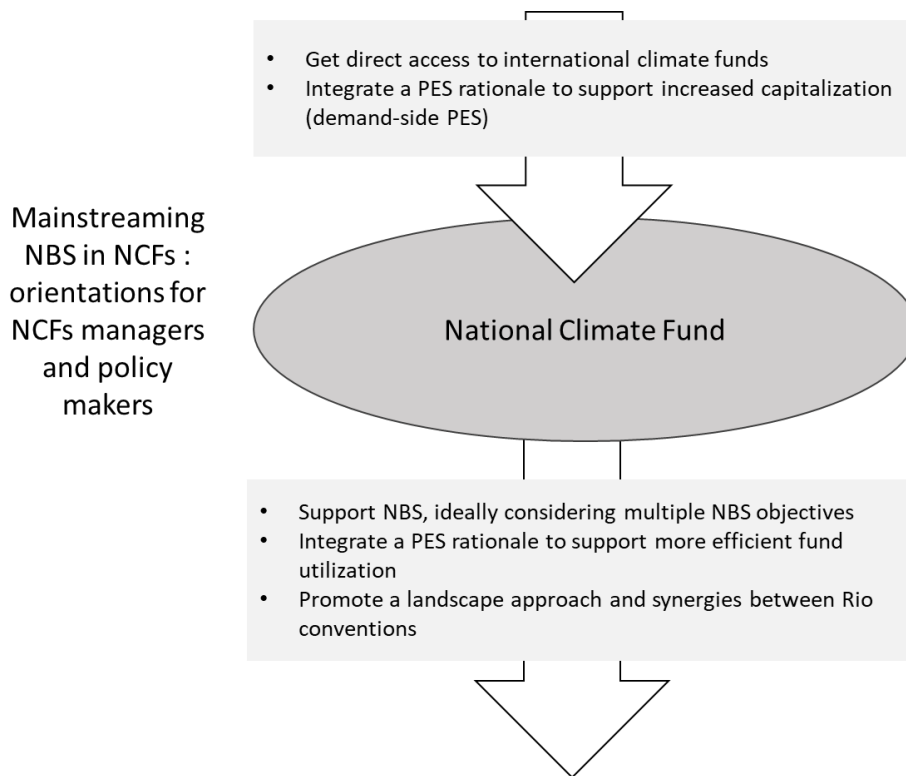


Figure 12: Recommendations to NCFs managers and policy makers.

## 6.5. Concluding remarks

Given the NCFs' potential to support NBS financing and to promote synergies between Rio Conventions' implementation, it seems critical that NCFs play a role for climate action, biodiversity conservation and land degradation neutrality financing. In the context of the United Nations Decade on Ecosystem Restoration 2021-2030, NCFs can be very relevant domestic financing instruments to support achievement of national restoration commitments.

It is a positive sign that the UNFCCC Standing Committee on Finance focuses one of its forum topics on NBS, and one can hope that NCFs are recognized as critical national tools for NBS financing when adopting some of the recommendations highlighted in this paper. Besides international climate funds supporting NBS may engage further with NCFs to achieve impacts on the ground. Boosting accreditation of NCFs for direct access to those international funds (the Green Climate Fund and the Adaptation Fund in particular) may be part of the solution.

While this article represents an initial survey on the potential role that NCFs can play to unleash NBS implementation, further research could be conducted for example on the ways NCFs could articulate approaches for Payments for Ecosystem Services.

## **7. Paper IV - How is the forest sector integrated in the National Recovery and Resilience Plans of EU countries?**

Being submitted to a peer-reviewed journal.

Authors: Giorgia Bottaro<sup>1</sup>, Ludwig Liagre<sup>1</sup>, and Davide Pettenella<sup>1</sup>

<sup>1</sup> Department of Land, Environment, Agriculture and Forestry of the University of Padova, Viale dell'Università, 16, 35020 Legnaro, Padova, Italy

Key words: recovery plans, forest sector, ecosystem services, policy innovation,

### **Abstract**

While the European Union (EU) has made significant efforts to support national EU economies to face the covid-19 pandemic-related challenges, allocating more than €672.5 billion for EU member states, one can question how the forest sector has been taken into account in this recovery programme. The present research article analyses the content of all available EU National Recovery and Resilience Plans (NRRPs), 26 plans in total, and questions what key forest-related themes are considered, as well as what is the financial contribution to the sector from these plans.

It appears that forests are considered important for eleven EU countries as part of recovery priorities, while four countries do not mention forests at all in their NRRP. Approaches followed by countries to include the forest sector are very heterogenous, and the paper calls for more concerted efforts between EU member states to improve how such integration can be made. Overall, climate change considerations are important, in particular the need to adapt forests to climate change. Similarly, topics related to the relevance of forests for a bioeconomy emerge, with innovations in the sector being recognized as critical by various member states. Funding allocated to the sector through NRRPs is very limited in most cases, while some countries like Sweden and Romania allocate significant funding for ambitious forest actions which can be sources of inspiration for other countries.

The new EU forest strategy represents an opportunity to boost the forest sector within EU economies and societies, and adoption of financing instruments linked to payments for ecosystem services and national funds could help get NRRPs resources to local forest stakeholders, thus improving local ownership of nature-based programmes supported by EU recovery efforts.

## 7.1. Introduction

The covid-19 pandemic has constrained the global economy in the last two years forcing all countries to innovate and develop urgency approaches to cope with the situation (Kapoor et al., 2021; Patrucco et al., 2021; Azoulay and Jones, 2020). The European Union (EU) has made significant efforts to support national EU economies to face the pandemic-related challenges. With the NextGeneration EU programme, the European Union aimed to support Member State (MS) recovery from the negative economic and social impacts caused by the sanitary emergence. It did so with the clear intention of providing a clear direction in which this recovery has to tend, transforming EU in a greener, healthier, and more digital economy and society.

The relevance of these measures is considerable. Indeed, it is the first time after the “European Recovery Program” of 1948, known also as Marshall Plan, that some European countries, in this cases the EU member states, receive a economic and financial support to recover from a disruptive event.

In the context of the NextGeneration EU, its pillar has been the promotion of the development of national recovery and resilience plans (NRRPs). Financing for the implementation of these plans is provided by the Recovery and Resilience Facility (RRF) that “makes €672.5 billion (in 2018 prices) in loans and grants available to support reforms and investments undertaken by Member States”<sup>21</sup>. The aim of this facility is “to mitigate the economic and social impact of the coronavirus pandemic and make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green and digital transitions”. The NRRPs thus come with significant funding allocations for all EU countries.

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<sup>21</sup> [https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en)

While the RRF aims at supporting both the digital and green transitions, one can question how far is the forest sector taken into account in the NRRPs. Indeed the recently approved EU Forest Strategy puts emphasis on the role of the sector for a sustainable bioeconomy, green jobs and the provision of ecosystem services (EU, 2021). It can thus be expected that the forest sector would have a significant place in these plans.

Key questions addressed in the paper include: i) how are NRRPs currently integrating the forest sector? ii) are there trends and key forest-related themes emerging from the NRRPs? iii) can the forest sector be considered as a priority topic in NRRPs, in particular based on financing made available for forests through these plans? iv) are national domestic financing schemes such as national forest funds (NFFs) and other economic instruments supporting the provision of forest ecosystem services (FES) used as means to channel RRF resources effectively? iv) what recommendations and orientations could be proposed to policy makers in view of NRRPs revisions and/or future submissions?

In order to try to reply to these questions the NRRPs of the European Member States (MS) have been analysed. The methodology used is described in section 2, while section 3 presents the main findings. The discussion of the results is introduced in section 4 and a brief conclusion is finally highlighted in section 5.

## **7.2. Material and methods**

In this section is presented the methods used to reply to the questions presented in the previous section.

In a first phase the NRRPs presented by each member state to the European Commission (EC) have been collected from the EC dedicated website<sup>22</sup>. Not all the countries submitted their NRRP in the same moment. Different consultations have been done to collect all the available programs, and in total 26 national plans (out of 27 member states) could be analyzed. The NRRPs were collected from May 2021 to September 2021. During all the mentioned period full reports have been continuously uploaded in the EC website making them available for public consultation. The full NRRPs have been presented to the EC only in the national languages by each MS. For each country a further synthesis in English is available. To have a

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<sup>22</sup> [https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en)

comprehensive overview about how the forestry sector has been addressed within the NRRPs, only the available full texts have been taken into consideration.

After NRRPs collection, their analysis has been implemented through the use of keywords. Because of the use of the national languages in the plans, each keyword has been translated in the national language of the analyzed country. The keywords used, in English, were: “*forest*”, “*silviculture*”, “*wood*”, “*biomass*”, “*tree*”, “*ecosystem service*”, “*innovation*”, and “*forest fund*”. Once the keywords were translated, a research on the full text was conducted. The portions of text found relevant were translated. It included whole paragraphs, subchapters, or chapters. The choice on the amount of texts to be translated depended on the extent in which the forest sector was included in the texts where the keywords were found and the relevance of the forest related topics included. The relevant texts were translated from the national language to English using the multilingual translation services provided by Google: Google translate. The portions of the NRRP translated represent the data that have been further analysed.

After NRRPs translation it was possible to proceed to data analysis. Two different analyses have been implemented to respond to the different research questions. In a first phase, to investigate how the forest sector was integrated into the NRRPs, data have been analysed to understand if the forest sector was directly or indirectly mentioned within the NRRP, or if no mention was present. With *direct* mention is intended that some aspects related to the forest sector have a dedicated chapter, sub-chapter, or investment section within the NRRPs. Differently, forest sector is *indirectly* mentioned in the NRRPs when it is embedded as part of sections and chapters/sub-chapters focusing on other sectors. Later, the texts have been deeper analysed to identify which forest sector-relevant themes appear in NRRPs. Thirteen different themes have been identified:

- circular bioeconomy: introduction of wood products in other sectors, e.g. for construction and industrial use, considering the whole product lifecycle, from its harvesting to its application (and recycling);
- green revolution / ecological transition: recognition of the importance of forest ecosystem services, wood and non-wood forest products to build a sustainable and resilient economy;
- green jobs: forestry seen as a favorable sector to sustain the increase of green jobs;
- rural development: actions impacting positively rural areas through forest-based solutions;



- climate action (adaptation): make forest ecosystems more resilient to climate change (which includes forest fire and natural hazard prevention) and increase resilience of territories and people through forest-based solutions (ecosystem-based adaptation);
- climate action (mitigation): forests and wood products as carbon sinks;
- biodiversity: action addressed to support and improve forest biodiversity and biodiversity in forests;
- sustainable forestry: improvement and higher adoption of sustainable forest management practices;
- forest ecosystem services (FES) provision/enhancement: willingness to improve or address forest management for FES provision and enhancement;
- urban nature-based solution: forest-related solutions implemented in urban areas;
- gender balance and women inclusion: commitment to make forestry a fairer sector;
- innovation: willingness to introduce innovative practices and technologies within different forest-related activities.

To analyse the selected portions of the NRRPs, the texts were labelled using these themes, which allowed to identify more precisely trends of how the forest sector is included in NRRPs.

In a second phase data on the amounts of investments and budgets allocated to the forest sector were collected and analysed to investigate the relevance of the forest sector in the NRRPs from a financial point of view. For most MS where a direct mention to the sector was present these data were available. Moreover, for each country the information about the total amount of investments planned were found. European disbursement is divided in grant and loan. The two different funding instruments have been considered jointly. When the specific funds allocated to the forest sector were expressed in local currency, it was necessary to convert them in € millions to homogenise the data.

### **7.3. Results**

Out of 27 Member States, 26 NRRPs were analysed. Only the Netherlands did not present their NRRP in the period considered in this research.

The following table (Table 23) answers the first key question of the paper. How are NRRPs currently integrating the forest sector?

Table 23: Presence of direct or indirect mention of the forest sector within the EU NRRPs

	<b>Direct mention</b>	<b>Indirect mentioned</b>	<b>No mentioned</b>
Austria			x
Belgium	x		
Bulgaria		x	
Croatia		x	
Cyprus	x		
Czechia	x		
Denmark		x	
Estonia		x	
Finland	x		
France	x		
Germany	x		
Greece	x		
Hungary		x	
Ireland			x
Italy		x	
Latvia		x	
Lithuania		x	
Luxembourg			x
Malta			x
Poland		x	
Portugal	x		
Romania	x		
Slovakia		x	
Slovenia	x		
Spain		x	
Sweden	x		

The analysis of the themes characterising the forest sector within the NRRPs, is depicted in Table 24. In this table are presented the key themes when forest related topics have been mentioned in the NRRPs both directly and indirectly.

Table 24: Themes related to the forest sector emerging from the NRRPs

	Circular bioeconomy	Green revolution / ecological transition	Green jobs	Rural Development	Climate Adaptation/ natural hazard prevention	Climate Mitigation	Biodiversity	Sustainable Forestry	FES provision/ enhancement	Urban Nature-Based solution	Gender Balance and women inclusion	Innovation
<i>Austria</i>												
<i>Belgium</i>			x		x		x		x	x		
<i>Bulgaria</i>			x	x	x	x	x		x			
<i>Croatia</i>				x			x					
<i>Cyprus</i>					x	x	x					
<i>Czechia</i>		x		x	x	x	x	x	x			
<i>Denmark</i>						x	x			x		
<i>Estonia</i>	x	x				x						x
<i>Finland</i>	x				x	x	x	x	x			x
<i>France</i>	x			x	x	x	x	x	x			x
<i>Germany</i>	x		x			x		x				x
<i>Greece</i>			x	x	x		x		x			
<i>Hungary</i>				x	x		x					
<i>Ireland</i>												
<i>Italy</i>				x			x		x	x		x
<i>Latvia</i>		x			x							x
<i>Lithuania</i>	x											x
<i>Luxembourg</i>							x			x		
<i>Malta</i>												
<i>Poland</i>				x					x			
<i>Portugal</i>	x		x	x	x	x	x	x	x			x
<i>Romania</i>					x		x	x		x		
<i>Slovakia</i>	x	x	x		x	x	x	x	x	x		x
<i>Slovenia</i>	x	x	x		x	x	x	x				x
<i>Spain</i>				x	x		x	x	x		x	
<i>Sweden</i>		x					x		x		x	

The final implemented analysis allowed us to understand the relevance of the forest sector within the NRRPs from a financial point of view, assessing in particular the share of the forest sector in the overall MS financing allocation (Table 25).

Table 25: Proportion of NRRP funds allocated for the forest sector

	Financed actions	million €	total NRRP fund (million €)*	% of NRRP funds
<i>Sweden</i>	Compensation for restrictions on land use of valuable forests	245	3200	<b>7.66%</b>
<i>Romania</i>	Afforestation	1,500	29300	<b>5.12%</b>
<i>Portugal</i>	Landscape Transformation of Vulnerable Forest Territories	270	16600	<b>2.35%</b>
	Fuel management lanes - primary network	120		
<i>Slovenia</i>	construction of the Center for Seed, Nursery and Forest Protection	6.18	2505	<b>2.16%</b>
	Greater wood processing for a faster transition to a climate-neutral society	48		
<i>Finland</i>	Climate action in the land use sector	30	2100	<b>1.43%</b>
<i>Greece</i>	National Reforestation Plan	224	30500	<b>0.73%</b>
<i>France</i>	Adaptation of forests to climate change, forest restoration	150	39400	<b>0.38%</b>
<i>Germany</i>	Investment for the development of wood sustainable building	70	25600	<b>0.27%</b>
<i>Czechia</i>	Investment on built forests resistant to climate change	0.34	7100	<b>0.17%</b>
	Water retention in forests	11.8		

\* from: [https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility\\_en](https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en)

## 7.4. Discussion

It is evident from the table 1 that there is a certain heterogeneity in the way the forest sector has been integrated by the EU Member States. In only four cases there is no explicit mention of the forest sector (Austria, Ireland, Luxembourg, Malta). The other MS are homogeneously distributed in mentioning it directly and indirectly, with 11 MS integrating the forest sector directly and the other 11 mentioning it indirectly.

Among the countries that do not mention forests at all, Austria, Luxembourg and Ireland are forested countries though with respectively a forest cover of 47%, 37%, and 11% (FRA, 2020). Austria disposes of a dynamic forest industry, forest-related jobs in Luxembourg reach up to

24% of employment in the northern province, while Ireland has designed innovative finance solutions for the forest sector such as the Irish Sustainable Forestry Fund<sup>23</sup>. The fact that these three countries have not included the forest sector in their NRRP is surprising at first glance. A hypothesis is that current resources available at national level for the sector suffice, and NRRPs resources would be better used in less supported sectors. For example while Luxembourg is engaged in wood-based innovations through its Wood Cluster with the development of a digital interface to connect the local wood demand and offer, it does not use the NRRP resources for economy digitalisation for this purpose, also probably because internal domestic resources are sufficient to cover the costs of such an initiative.

Among the countries that mentioned forests directly in their NRRPs with a dedicated chapter, section, or investment programme, one can observe very different rationales from one country to another. France and Czech Republic for example insists on the importance of adapting forest ecosystems to climate change, while Germany promotes wood-based construction as part of a bioeconomy development. Slovenia also underlines the importance of improving national wood value chain to facilitate the transition to a circular bioeconomy. Cyprus, Portugal, and Greece clearly identify forest fires prevention and fighting as a priority which seems logical for countries exposed to the climate risks of the Mediterranean region.

The forest sector in NRRPs is addressed in a diversity of ways, and the analysis with key themes (table 2) shows different trends. For example, the links between forests and biodiversity and ecosystem services are quite present, as well as with rural development and climate change adaptation. Even though climate mitigation is mentioned in several NRRPs it seems the biggest priority is put on the need to adapt forests to climate change, and to promote forests as a way to build more resilient territories, including in the context of natural hazards. Importance of forests for green jobs is mentioned in less than 50% of the NRRPs while the role of the sector for job creation is well known (UNECE & FAO, 2020).

Forest innovation and bioeconomy are emerging topics of interest in NRRPs which resonates with the efforts to promote such fields of work at EU levels (e.g. through the Circular Bioeconomy Alliance<sup>24</sup>, Knowledge Centre for Bioeconomy<sup>25</sup> and research programmes from the Joint Research Centre). Innovation is an important forest-related theme in some NRRPs.

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<sup>23</sup> <http://www.siff.ie/>

<sup>24</sup> <https://efi.int/cba>

<sup>25</sup> [https://knowledge4policy.ec.europa.eu/bioeconomy\\_en](https://knowledge4policy.ec.europa.eu/bioeconomy_en)

Several MS clearly mention the willingness to introduce some innovative approaches to their forest sector. It addresses a variety of topics from the technological innovation to support precision forestry (Finland) and improve energy efficiency (Slovenia), to social innovation mentioned in Latvia to sustain the productivity increase of the sector.

A further novel element that was expected to be found, due to the increase of social and policy attention on this topic, was the introduction of Payment for Ecosystem Services schemes. Indeed, the funds deriving from the NRRP could be a good opportunity to sustain this innovative and well studied instrument and to spread its implementation. By contrast, support to payments for ecosystem services are rarely mentioned in the NRRPs. Furthermore, the mention of National Forest Funds was present just in a case (Romania). Such mechanisms, despite being quite rare in EU countries, represent good opportunities to channel incentives and financial resources directly to local beneficiaries, thus increasing local ownership of forest projects and activities. In the new EU forest strategy (EC, 2021) it is mentioned that the EU commission “is exploring how to facilitate the use of national funds for forestry measures and target them better for ecosystem services”. This is a positive signal that could be supported further by NRRPs.

Table 3 highlights that when they are integrated in NRRPs, forests benefit from a very limited portion of the NRRPs budgets. Exceptions include Sweden and Romania with respectively more than 7 and 5% of the budgets, while most other countries show a proportion between 2.35% and 0.17%. In the case of Sweden the state is planning to establish new protected areas through the purchase of forest properties and the compensation to local forest owners who will lose possibility to manage their forest for economic purposes (Sweden RRP, 2021). Such a policy has significant costs given the opportunity costs of forest exploitation. In Romania the forest cover accounts for 29% of the country land, with an optimal percentage of 40%. Plans are in place to restore forests being degraded (mainly because of illegal logging and climate change). Restoration and afforestation projects, combined with efforts to improve forest health and adapt to climate will turn quite costly (Romanian RRP, 2021).

Building on the present analysis, a few recommendations for policy-makers can be derived, for example in view of a possible resubmission or improvement of NRRPs in the future :

- Take stock of the diversity of approaches for integrating forests in NRRPs considering lessons learned and good practices from other EU countries.

- Consider existing national forest strategies and policies, as well as the new EU forest strategy, in order to align key orientations with the content of NRRPs.
- Promote the multiple forest ecosystem services, introducing innovative practices to support both public and private forest owners in their provision.
- Recognise the role of the forest sector for a wood-based bioeconomy as a catalyst for green jobs creation and ensuring a resilient development of rural areas.
- Support the use payment of ecosystem services schemes as ways and of relevant domestic funds as ways to channel NRRPs resources to local beneficiaries and forest stakeholders.
- Promote EU-level dialogues on the importance of forests in NRRPs, and help mainstream the forest sector in the plans and strategies of key ministries, in particular the Finance Ministries.

Key organisations at EU level may have a critical role to play to facilitate such policy processes and dialogues, such as (among others) ForestEurope, the European Forest Institute (EFI), the Confederation of European Forest Owners (CEPF), and the European State Forest Association (EUSTAFOR). It can be expected that they would be driving forces to ensure NRRPs include forests adequately in NRRPs.

## **7.5. Concluding remarks**

Further research could include i) additional national level analysis, to assess more in details the linkages between national contexts and the forest-related content of the NRRPs, ii) further assessment of the trends in geo-climatic regions with similar forest-related issues. Such an advanced research work could help identify tailor-made recommendations at country level on how to better integrate forests in NRRPs, while promoting regional or sub-regional cooperation between EU MS with similar geoclimatic conditions. This effort may also turn positive in view of the EU forest strategy implementation and to address some of the challenges ahead at EU level. Indeed it is proven that more than half of EU countries are prone to desertification (EU, 2018) and forests have surely a role to play to counterbalance this aggravating trend. While the UN Decade on Ecosystem Restoration has started, the EU has an opportunity to bring a significant restoration contribution to the world. To maximize positive impacts, all financing solutions should be seized and NRRPs represent one of the best opportunities going forward.

## **8. Overall discussion**

In the thesis the two first papers (I and II) directly contribute to shed light on how NFFs can unleash the provision of forests goods and services, and the two additional papers (III and IV) indirectly inform, through the exploration of some of the emerging forest finance trends that NFFs can foster, how NFFs can better support provision of forests goods and services.

### **8.1. Role of NFFs for Payments for Ecosystem Services**

The role of national forest funds for payments for ecosystem services is highlighted throughout the research outcomes.

Paper I in particular shows key results on:

- Relevance of NFFs for Payments for Ecosystem Services (PES);
- The intermediary role of NFFs for PES-like mechanisms;
- PES-like characteristics of NFFs.

If we consider the Wunder (2005) PES definition, our research has shown that all of the NFFs case studies' schemes selected complied only partially with it. Therefore, one could consider the NFFs case studies' schemes as PES-like schemes, meaning that one of more key-PES criteria is missing, as specified by Masiero & Pettenella (2017). For example, the buyer of the ES may not be well-defined, and in all case studies, the transaction is not voluntary, as payments are mandatory – either through taxes or through mandatory contributions from companies and operators in specific economic sectors.

In general, one can deduct from these examples that NFFs can play a relevant catalytic role for activating PES-like mechanisms. They are, indeed, intermediaries between ES buyers and ES providers even though buyers may not provide payments voluntarily. In all cases, the result-based payment ensures the conditionality of the PES-like approach.

Furthermore, analysing key PES preconditions as proposed by Masiero & Pettenella (2017) provides additional understanding on the relevance and sustainability of the proposed schemes. Among the strengths of all analysed models, one can point out: the permanence of the mechanisms with a self-sustaining capitalization approach, while additionality is also



ensured as result-based payment are a key success factor of the delivery of ecosystem services. A grey area remains nonetheless on the leakage issue, which may not be addressed appropriately in all cases. The PES rationale in the capitalization of the fund is well defined in one of the analysed cases (the Vietnamese National Forest Fund, VNFF), while the PES rationale on the utilization side of the fund is well defined in another one of the analysed cases only (FONAFIFO, Costa Rica). The VNFF directly connects the economic sectors' contributions to the benefit they gain from forest resources or to the impacts they may have on forest ecosystems. Differently, the FONAFIFO capitalization heavily relies on taxes more indirectly connected to forest ecosystems. On the utilization side, only the FONAFIFO made efforts to prioritize ES depending on their relative importance. So, we may qualify some PES-like NFF models as “demand-side” PES-like scheme (such as the VNFF model) and other PES-like NFF models as a “supply-side” PES-like mechanism (such as the FONAFIFO model).

## **8.2. Role of NFFs to support small-scale forest businesses to deliver forest goods and services**

This role is developed in particular in paper II which highlights the diversity of forest funds models, and types of financing support used for small-scale forest businesses. This diversity is also reflected in the capitalization structures of the funds (some already following a blended approach for example), as well as in the types of supported small-scale forest businesses.

While some funds finance the upstream part of forestry activities (plantations, natural regeneration, conservation), others can operate on both ends, with significant positive impacts on the downstream part of forest activities (e.g. wood processing and transformation). A limited number of funds explicitly support both wood and non-wood forest products.

Financing instruments used are also very different from a fund to another. Funds' case studies use diversified approaches including a concession approach, loan and equity financing and grants. Funding instruments used by the funds have a very important role on the types of projects and beneficiaries that can be mobilized and supported.

Funding instruments used also have a direct impact on the delivery of ecosystem services. For example, equity financing is very much needed to match with the long termism of sustainable forestry projects. As stated by a representative from FCCF (Luxembourg):

*“Ecosystem services are most pertinent at the forest management end of the value chain – even though a good understanding is required at each step of the process. Although working capital loans may be a necessity, equity investments allow for a longer-term development of forestry ecosystems” (FCCF quote).*

A diversity of Ecosystem Services (ES) is monitored in the analyzed fund cases. But only two funds monitor and incentivize more than two ES, namely carbon, biodiversity, and water, corresponding to the two funds having already developed a PES rationale (FONAFIFO and FONABOSQUE) among the analyzed cases. As pointed out in paper I national forest funds can operate as PES-like schemes, sometimes requiring adaptations in their ways to utilize resources in order to engage in PES-like approaches. Private forestry funds and other funds models not yet fully supporting ES provision may thus benefit from developing more proactive PES-like approaches which may in turn help in generating alternative revenue streams for example through water payments, Corporate Social Responsibility (CSR) partnerships, carbon revenues, REDD+ financing, etc.

### **8.3. Role of NFFs for emerging needs (climate change, Covid-19 recovery, ecosystem restoration, etc)**

Papers III and IV specify how NFFs could play a key role for critical issues related to climate change and the Covid-19 crisis recovery.

Paper III shows that National Climate Funds only rarely support Nature-based Solutions (NBS) - and per extension forest activities - in a relevant way so far. And for those NCFs already integrating NBS, significant improvement in approaches to do so could be made. It calls for a continued role of NFFs to support forest activities and NBS financing, while forms of collaborations between NCFs and NFFs could be envisioned. Indeed, as NCFs have the possibility to capture more easily climate finance flows, one could imagine a possible intermediary role for NFFs in channelling climate finance towards NBS and forest activities. Thus, NCFs could fully utilize the NFFs expertise in contexts where they already exist. The same approach could apply between emerging Conservation Trust Funds (CTF) and already established NFFs. CTFs importance is increasing globally (CFA, 2020) to address financial gaps for biodiversity conservation, and they could represent an opportunity for NFFs, either through the reform of existing NFFs which could play the role of CTFs, or with NFFs playing

a financial intermediary role (when they exist) to facilitate expenditures for forest-related conservation activities.

Paper IV presents how the forest sector has been included in National Resilience and Recovery Plans of EU countries<sup>26</sup>. First results show that a limited number of countries integrate the forest sector in a relevant way, and when they do so, approaches are very different from a country to another. More coherence could nonetheless have been promoted for example in application of the new EU forest strategy that recognize the importance of financing mechanisms such as NFFs. This thus leads to formulate a variety of orientations and recommendations on how to improve forest integration in NRRPs, including through the use of NFFs and Payments for Ecosystem Services schemes.

Other important considerations for the coming years include implementation of the UN Decade on Ecosystem Restoration and of related regional and national restoration commitments<sup>27</sup> which will call for the use of dedicated domestic financing mechanisms. NFFs will surely have an important role to play in achieving ecosystem restoration targets, and they could also be well positioned to foster governance in landscape scale approaches with potential to catalyse provision of multiple ecosystem goods and services.

#### **8.4. Reflections on future perspectives for NFFs**

Analyzed case studies highlight that none of the funds has a strategy and the ability to finance all aspects of the forestry activities for SFM, forest conservation, restoration and sustainable production, the development of a wood-based bioeconomy, while catalyzing multiple ecosystem services. Comprehensive financing approaches for the forest sector thus may require more agile and flexible financing instruments, potentially structured as a combination of several financing vehicles. For example, one fund could host under one umbrella several funding windows such as a conservation trust fund, an investment fund, a technical assistance facility, a loan facility, a PES window, etc, as illustrated in figure 14. For private sector support for example, this could allow financing and investment in several parts of the value chains, thus building in the necessary flexibility required to support private sector companies with diverse realities (Boscolo & al. 2010).

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<sup>26</sup> As a response of EU countries to the covid-19 pandemics.

<sup>27</sup> Such as the AFR100, 20x20, ECCA30 initiatives

But such a “all-in-one” fund structuration approach, despite interesting as a concept, is not necessarily easy to operate and a relevant approach may also rely on more coordination and cooperation between existing funds at national and landscape levels. Indeed, governance between domestic funds and financing sources is critical to seize the maximum of positive impacts for forests goods and services. Such a good governance and coordination role may also be a key function of NFFs in the future, contributing to ensure a smooth cooperation between funding sources engaged in supporting the provision of forests goods and services.

The Landscape for People, Food and Nature Initiative (2019) advised the development of Landscape Investment Funds, as well as the emergence of landscape investment facilitators, and FAO & the Global mechanism (2015) called for the development of marketplaces for forest and landscape restoration. These are precisely functions that NFFs could play if reformed adequately. Figure 13 specifies these possible functions that NFFs could support and lead on.

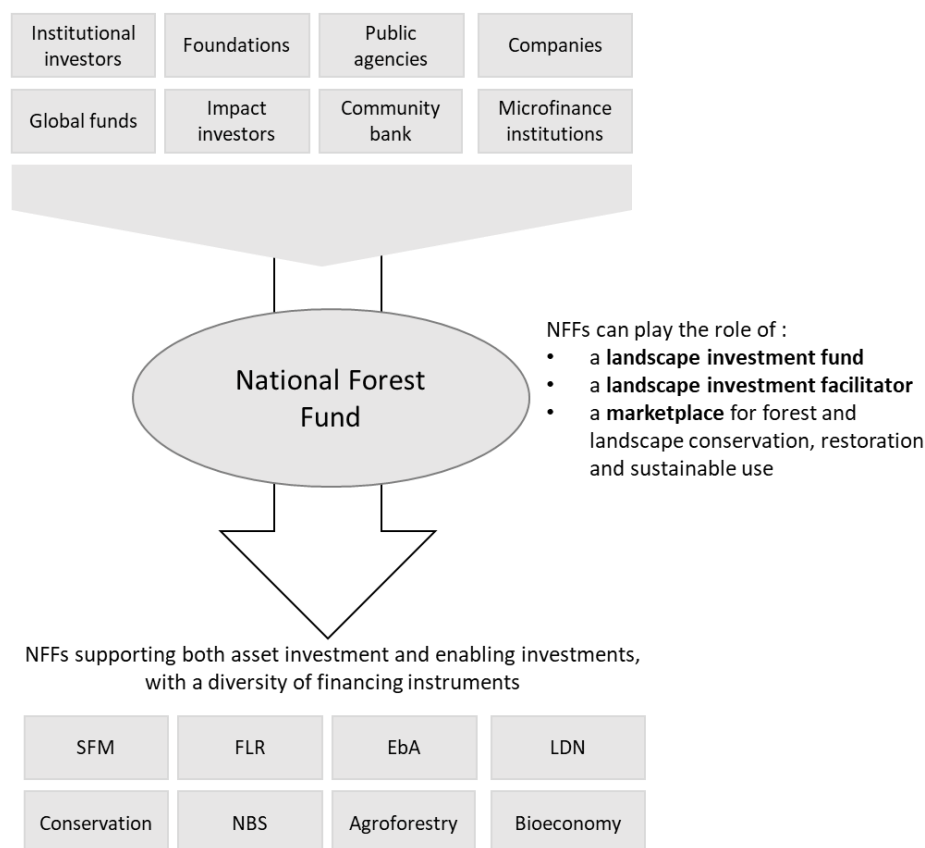


Figure 13: Possible NFFs role as landscape investment facilitators

Louman (2021) explains that for the time being landscape finance initiatives are mostly value chain finance projects applying a landscape lens, meaning supporting other landscape

components through the value chain of interest (IDH, 2018). But very few landscape finance initiative exists where several landscape components and multiple value chains are supported at the same time. The latter approach could be promoted by NFFs playing either a landscape coordination role and/or a landscape investment fund function.

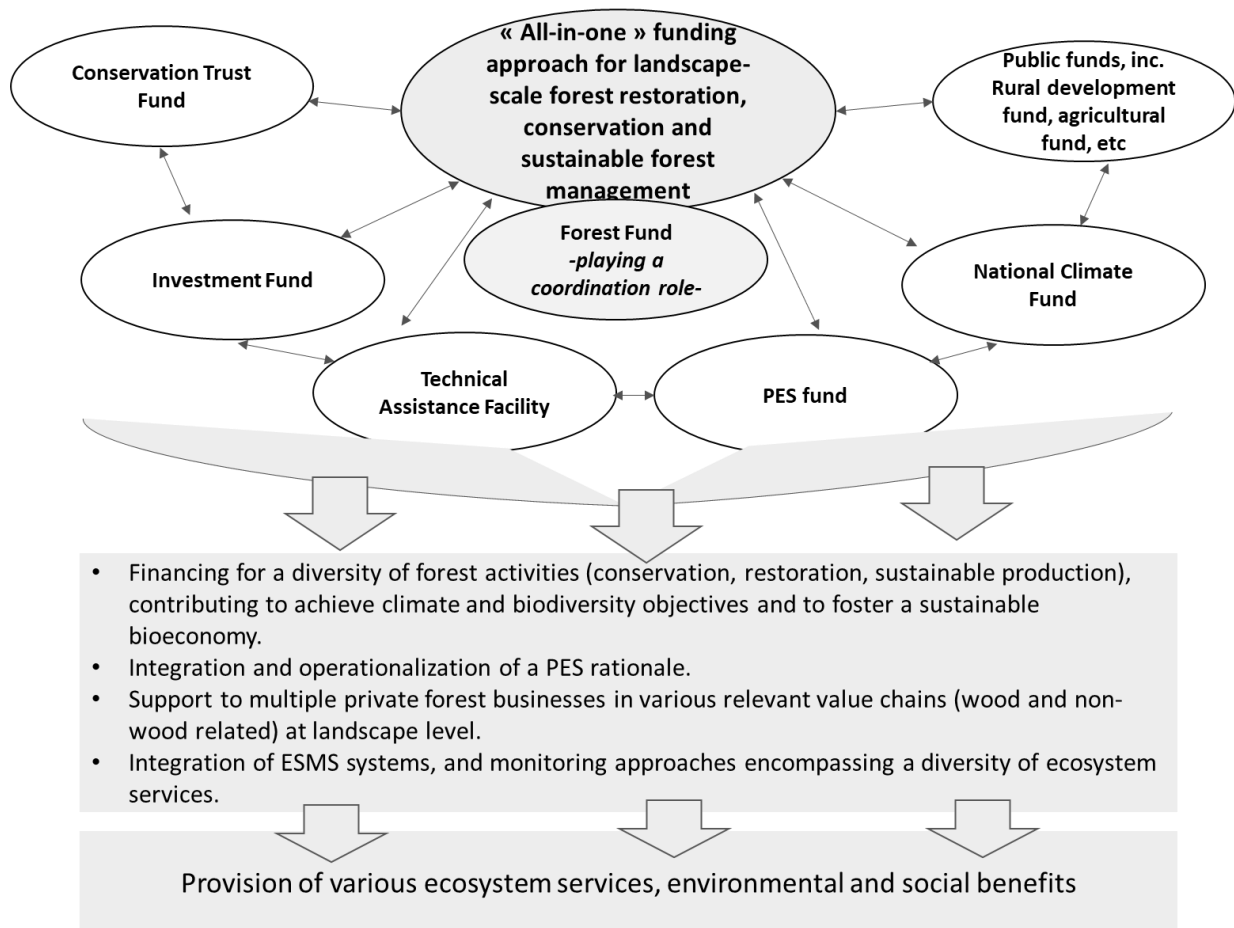


Figure 14: Importance of landscape-scale coordination between funds

## 8.5. Recommendations for NFF managers and policy makers

From the research results one can identify a series of recommendations for NFF managers and policy makers, which can be organized as per the key NFFs features.

### Capitalization

- Consider the PES approach on the demand-side which will help mobilize economic sectors benefitting from ES.

- Apply the polluter-pay and beneficiary-pay “principles” to mobilize economic sectors and operators with a PES rationale.
- When relevant, mobilize taxes affected to the fund. Domestic sources such as (eco)taxes help countries demonstrate ‘skin in the game’ vis-à-vis international donors.
- When meaningful, use the NFF for ES valorisation, including on established markets (e.g. with REDD+ and biodiversity-offsets). NFF can have a market ‘broker’ role as demonstrated through the PES intermediary function that they can play.
- Develop a mixed capitalization approach to ensure self-financing and thus permanence of the PES scheme. Funds mobilizing a mix of public, private, domestic and international sources have proven to have a stronger and more resilient funding approach.
- Proactively valorise ES, including with carbon markets, payments for water services, sustainability certification such as FSC and organic certifications which may offer capitalization opportunities.

## **Utilization**

- Consider the PES approach on the supply-side in order to ensure resources are channeled to activities effectively provisioning ecosystem services.
- Prioritize ES and differentiate payments for an efficient use of resources. This will help to rationalize the use of funds, and to maximize the number of beneficiaries.
- Decentralize operations of the fund for a close support to local beneficiaries, and better control of ES provision. It may entail the creation of local fund offices at the province level for example. Fund teams managing operations will thus get closer to beneficiaries which can help to provide technical assistance among other tailor-made services to local beneficiaries.
- Apply result-based payments approaches (RBP) to ensure conditionality of the PES approach. It will in turn help to maximize impacts and can be meaningful when the fund seeks to align with RBP practices of global funds such as the GCF (with its REDD+ RBP programme).
- Include biodiversity conservation, climate action, land degradation neutrality (LDN) and restoration activities in the fund allocation possibilities. Fostering Rio conventions synergies at the fund level may facilitate resources mobilization from the financing mechanisms connected to the conventions. For example the Global Environmental Facility has the ability to finance the priorities of the three Rio conventions in a synergetic manner.

- For private sector-oriented funds: provide support to the upstream and downstream segments of value chains, including for wood and non-wood forest products. It will secure a holistic value chain approach, open more bankable opportunities for the fund, which will improve profitability and sustainability.
- Foster adoption of a diversity of financing instruments such as grants, loans, equity and guarantees, in order to adapt to the diversity of funding needs (incl. among small forest businesses). This is of particular relevance in the context of landscape approaches, where various value chains and landscape stakeholders will have different funding needs with diversified project maturities.

## **Governance**

- Take stock of positive examples of NFFs operating with PES-like approaches to mainstream the PES approach in existing NFFs.
- Need for a good alignment between NFF goals and biodiversity conservation, climate, LDN and restoration goals (including the goals from the NBSAP, NDC, NAP-CCD, national FLR strategy, etc).
- Reinforce the dialogue between the CBD, UNFCCC and UNCCD focal points and the forest administration when they are not based in the same institution. It can be achieved by ensuring participation of national Rio conventions' focal points in boards meetings.
- In the Covid-19 context, include activities that foster resilience and recovery benefits. Aligning funds allocation priorities with the national recovery plans would be helpful in that perspective.
- Open governance processes to a variety of stakeholders, diverse sectors, the private sector, and civil society representatives. It appears as a good practice to ensure long-term inclusion of various stakeholders making the decision-making process more sustainable.
- Ensure coordination with other domestic funds such as NCFs and CTFs to maximize positive impacts for forest goods and services. This is of particular importance when other domestic funds may have overlapping mandates.
- Innovate to foster landscape-scale funding solutions, thus increasing the level of coordination with landscape stakeholders, and seeking for synergies with the diverse funding sources available.

## **Monitoring & evaluation(M&E)/Oversight**

- Define biodiversity, climate, LDN and restoration indicators as part of the NFF M&E system. It will improve fund's connection with national strategies related to the Rio conventions' processes.
- Develop safeguards systems to avoid leakages. In that perspective, fostering a landscape approach can be a mitigant, as well as the development of geographical information systems which will help to monitor the areas prone to potential leakages risks.
- Report the fund achievements as part of the reporting to the CBD, UNFCCC and UNCCD, and ensure such an effort is valorized through outreach and communications vis-à-vis donors, thus reinforcing capitalization opportunities.
- Integrate systematically ESMS systems, thus build better E&S risks management approaches (which may in turn give access to sustainable finance opportunities). It will help qualify the fund for private finance opportunities, as ESG criteria can easily be connected with a ESMS system.



## 9. Overall conclusions and future research

The PhD project has helped to clarify the role NFFs can play to unleash the provision of forest ecosystems goods and services, and their role for PES approaches has been clearly identified. If the set of policy and management orientations per NFF features (see sub-section 8.5) is an addition to the current situation of the NFF features framework and builds towards a revised conceptual framework for NFFs, further research needs will have to be addressed in the future. The complexity and depth of the initial research questions are indeed calling for more investigation and it is desirable that other students, scientists and researchers embark in the effort to specify the relevant conceptual framework for effective NFFs in different contexts.

For example it would be helpful to define and research on the key sub-features that would influence a successful NFF. Some of these sub-features are summarized in the non-exhaustive list of table 26.

Table 26: Possible additional sub-features to complete the existing NFF conceptual framework

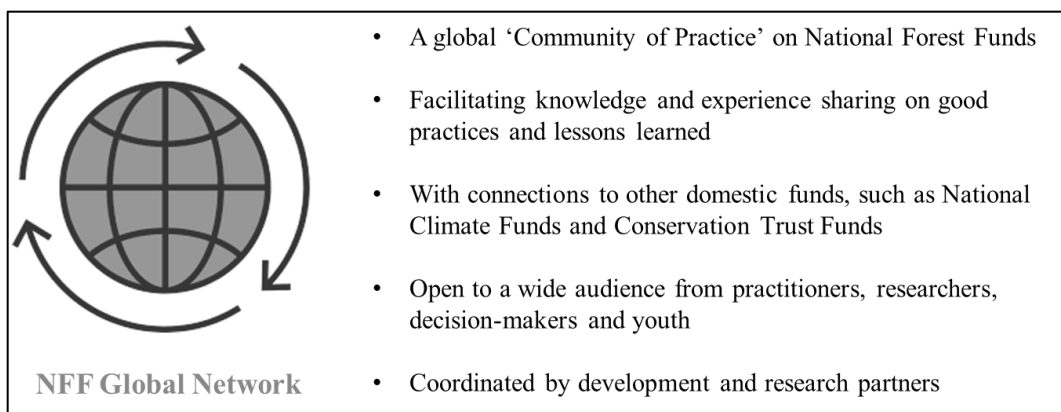
<b>NFF features</b>	<b>Governance</b>	<b>Capitalization</b>	<b>Utilization</b>	<b>Monitoring &amp; evaluation</b>
<b>Examples of sub-features</b>	<ul style="list-style-type: none"> <li>▪ Board/management composition, incl. gender</li> <li>▪ Transparency and anti-corruption measures</li> <li>▪ Decentralization</li> <li>▪ Monitoring &amp; evaluation, reporting connected to decision-making</li> <li>▪ etc</li> </ul>	<ul style="list-style-type: none"> <li>▪ Proportion domestic sources / international sources</li> <li>▪ Access to international funds (GCF, GEF, AF, etc)</li> <li>▪ Capitalization growth rate</li> </ul>	<ul style="list-style-type: none"> <li>▪ Landscape vs Multisectoral vs forest focused</li> <li>▪ Transaction costs level</li> <li>▪ Types of ecosystem services concerned</li> <li>▪ Global targets concerned (LDN, Aichi, NDC targets, etc)</li> <li>▪ Gender considerations</li> <li>▪ Support to land rights securization,</li> <li>▪ Spending efficiency rate</li> <li>▪ etc</li> </ul>	<ul style="list-style-type: none"> <li>▪ Use of GIS</li> <li>▪ Result-based Payment in place</li> <li>▪ Anti-corruption agencies involved</li> <li>▪ Monitoring &amp; evaluation, reporting connected to decision-making</li> <li>▪ etc</li> </ul>

Emerging perspectives for NFFs such as their possible role for Nature-based Solutions to climate change and for covid-19 recovery efforts will also require further investigation. The development of NCFs and CTFs are important opportunities to be seized in that regard, as well as the recovery plans and related financing programmes.

The question of the NFFs functions for landscape approaches is also very critical to the ongoing efforts to build better coordinated finance approaches benefitting several landscape value chains and components. This should form part of additional research work conducted on NFFs.

Given the knowledge gaps on NFFs, it is thus advised to support further research on this topic in the future. Considering the appetite of NFFs managers to share lessons learned and good practices, it may be relevant to explore possibilities to create a ‘Global network of NFFs’. The University of Padova could play a leading role on science and research, jointly with other academic and research institutions. Facilitated together with technical and financial cooperation partners, such a network could directly

benefit existing and new emerging NFFs, as well as other stakeholders engaged on sustainable finance.



*Figure 15: Idea of a NFF Global Network*

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## Annex I – All research outcomes

Several research outcomes have been produced in the 3 years PhD program and summarized in the table below.

Table 27: List of research outcomes

Title / Authorship	Abstract status	Full paper status	Publication status	Journal targeted	Presentation (planned) at	Integration in the PhD thesis
<b>1) How can National Forest Funds catalyse the provision of ecosystem services? Lessons learned from Costa Rica, Vietnam and Morocco</b>  Main author	Available/Accepted for presentation in an international conference	Elaborated (2 rounds of revisions) – accepted for publication	Published	Ecosystem Services Journal	BIOFIN International conference (cancelled due to Covid-19)	Core PhD article
<b>2) How national forest funds can support small-scale forest businesses to deliver ecosystem services?</b>  Main author	Available/Accepted for presentation in an international conference	Elaborated (2 rounds of revisions) – accepted for publication	Accepted for publication	Austrian Journal of Forest Science – an open access journal by MDPI	Presentation delivered at the IUFRO conference, Bolzano, November 7-8 October 2020	Core PhD article
<b>3) How National Climate Funds can catalyse financing for Nature-based Solutions?</b>  Main author	Available/Accepted for presentation in an international conference	Elaborated (draft available / finalized for publication)	Submission planned	Submission planned at the Nature-based Solutions Journal  Also part of the UNFCCC Standing Committee on Finance (UNFCCC - SCF) Forum proceedings	Presentation planned at the SCF Forum, to take place in the first half of 2022 (not yet rescheduled due to Covid-19)	Core PhD article
<b>4) How is the forest sector integrated in the National Recovery and Resilience Plans of EU countries?</b>	Available	Elaborated (draft available / finalized for publication)	Submission planned	Journal is being identified	Not planned	Core PhD article



Co-author						
<b>5) Which financing strategies can unleash forest-based industries engagement for ecosystem restoration?</b> Main author	Available/Accepted for presentation in an international conference	In development (targeting release at WFC 2022)	Not yet published	Ongoing journal identification	Presentation at Commonwealth Forestry Conference, Vancouver, Canada (already delivered)	Directly informs the introduction and discussion sections of the PhD thesis
<b>6) How can Forest Funds enhance Landscape Governance for improved restoration? Lessons learned from existing fund cases</b> Main author	Available	In development for WFC (May 2022)	Not yet published	Proceedings of the World Forestry Congress XV (WFC XV)	World Forestry Congress (WFC XV), May 2022	Directly informs the introduction and discussion sections of the PhD thesis
<b>7) The end of the COP as we know it? Reviving global climate governance in interesting times</b> Co-author	Available/Accepted for presentation in an international conference	Elaborated (1 <sup>st</sup> round of revisions)	Under revision	Climate Policy Journal	Presentation delivered at Wuppertal Institute workshop, June 2020  Side-event at Glasgow COP 26	Indirectly informs the discussion of the PhD thesis

## Annex II: Tentative list of National Forest Funds (NFFs) globally

(Data from FAO, 2015; GIZ-FAO, 2013; Rosembaum & Linsay (2001) and L.Liagre)

Nb	Country	NFF name	Nb	Country	NFF name
1	<b>Albania</b>	Fund of the Directory general of forest and Pasture	21	<b>Croatia</b>	Simple biological reproduction account
2	<b>Argentina</b>	Fondo nacional para el enriquecimiento y la Conservacion de los bosques nativos	22	<b>Cuba</b>	National fund for forest Development
3	<b>Benin</b>	Fonds national pour l'Environnement et le Climat (FNEC)	23	<b>Cyprus</b>	Communal forest funds
4	<b>Bhutan</b>	Bhutan Trust fund for Environmental Conservation	24	<b>Dominican Republic</b>	Special Fund
5	<b>Bolivia</b>	National Fund for Forest Development	25		Forest Trust fund
6	<b>Botswana</b>	Forest Conservation of botswana and the botswana environment fund	26	<b>France</b>	Fonds forestier national
7	<b>Brazil</b>	Reforestation fund	27	<b>Gabon</b>	Fonds forestier national
8		Amazon fund for forest Conservation and Climate Protection	28	<b>Gambia</b>	National forestry fund
9		Fundo nacional de Desenvolvimento florestal	29	<b>Guatemala</b>	Special forest fund
10		Brazilian Fund for Biodiversity (FUNBIO)	30	<b>Guinea</b>	Fonds forestier
11	<b>Bulgaria</b>	Concessions Cost recovery fund	31	<b>Guinea bissau</b>	National forest fund
12	<b>Burkina faso</b>	Fonds forestier	32	<b>India</b>	Compensatory afforestation fund
13	<b>Cameroon</b>	Fonds spécial de Développement forestier	33	<b>Indonesia</b>	Reforestation Fund
14	<b>Canada</b>	Forest resource improvement association of Alberta	34		Fund for REDD+ in Indonesia (FREDDI) (in progress)
15		Forest investment account (british Columbia)	35	<b>Italie</b>	National Forest Fund
16	<b>Chile</b>	Fund for native forests	36	<b>Jamaica</b>	Forest Conservation Fund
17	<b>Republic of the Congo</b>	Fonds d'aménagement et des ressources naturelles	37	<b>Kenya</b>	Forest Management and Conservation fund
18	<b>Colombia</b>	Account for the Conservation of forests	38	<b>Lao People's Democratic republic</b>	Forest and forest resource Development fund
19	<b>Costa rica</b>	National forest financing fund	39	<b>Lithuania</b>	Forest Fund
20	<b>Côte d'ivoire</b>	Forest Development fund	40	<b>Lesotho</b>	Forest fund
			41	<b>Madagascar</b>	Fonds forestier national
			42	<b>Malawi</b>	Forest Development Management fund

Nb	Country	NFF name	Nb	Country	NFF name
43	<b>Mali</b>	Fonds d'aménagement et de Protection des forêts	67	<b>South africa</b>	National forest recreation and access fund
44		Fonds d'aménagement et de Protection de la faune	68	<b>Sri Lanka</b>	Forest Department fund
45		Mali Climate Change Fund	69	<b>Sudan</b>	National reservation fund
46	<b>Malaysia</b>	Forest development funds	70		national environment fund
47	<b>Mauritania</b>	Fonds national de Développement forestier	71		Shelterbelt fund
48	<b>Morocco</b>	Moroccan national forest fund	72	<b>Trinidad and Tobago</b>	Green fund
49	<b>Mozambique</b>	Forest and Wildlife Development fund	73	<b>Tunisia</b>	Fund for sylvo-Pastoral Development
50	<b>Namibia</b>	Environmental Investment Fund	74	<b>Uganda</b>	National Tree fund
51	<b>Nepal</b>	User group funds	75	<b>United republic of Tanzania</b>	Tanzania forest fund
52	<b>Nicaragua</b>	National forest Development fund	76	<b>United republic of Tanzania (Zanzibar)</b>	Forestry Development fund
53	<b>Nigeria</b>	Ecological fund (inactive)	77	<b>United States of America</b>	KnutsonVandenberg fund
54	<b>Niger</b>	Fonds d'aménagement forestier	78		Reforestation Trust fund
55		Fonds Villageois de Développement	79		Rural fire Disaster fund
56		Fonds de Contrôle Forestier	80		Land and Water Conservation
57	<b>Norway</b>	Forest Trust fund	81		America the beautiful act
58	<b>Peru</b>	in progress	82		Woodland incentive Program fund (Maryland)
59		Peruvian Trustfund for National Parks and Protected Areas (Profonampe)	83		Chesapeake bay Trust (Maryland)
60	<b>Philippines</b>	Philippines special Deposit revolving fund	84		Forest resource Trust (oregon)
61		Tropical forest Conservation fund1	85	<b>Uruguay</b>	Forest fund
62	<b>Portugal</b>	Foresta Atlantica Fund	86		
63	<b>Rwanda</b>	National Climate and environment fund of rwanda (FONERWA)	87	<b>Vanuatu</b>	Biodiversity Conservation Trust fund (inactive)
64	<b>Senegal</b>	Fonds forestier national	88		Forest Fund
65	<b>Sierra Leone</b>	Reforestation fund	89	<b>Vietnam</b>	Forest regeneration fund
66	<b>Solomon islands</b>	Forest Trust (inactive)	90		Forest Development and Protection fund (VNFF)
			91	<b>Zambia</b>	Forest revenue fund
			92		Forest Development fund
			93		Fund for Joint forest Management
			94	<b>Zimbabwe</b>	Environment fund (inactive)

# Annex III – Full survey for paper I

[https://docs.google.com/forms/d/e/1FAIpQLSeXZEmDIPsz\\_VzQYTt3LLIp3poCkTHF01IsDfZGje1TF1jBmA/viiewform](https://docs.google.com/forms/d/e/1FAIpQLSeXZEmDIPsz_VzQYTt3LLIp3poCkTHF01IsDfZGje1TF1jBmA/viiewform)

## 1. General information

1.1. NFF name and acronym

Your answer

1.2. When was the NFF created (year)?

Your answer

1.3. What are the underlying legal documents (law, decree, etc)

Your answer

1.4. How many staff (equivalent full-time person/year) work for the NFF?

Your answer

1.5. Physical address of the NFF Headquarters

Your answer

1.6. Contact person(s) - please specify name, email, phone data

Your answer

1.7. Website (if any) - please specify web link

Your answer

## 2. NFF Capitalisation

This section investigates on the sources of funds capitalizing the NFF

2.1. How much funding has been mobilized by the NFF in the last 5 years? (approximate annual funding mobilized between 2014 and 2018, in USD or local currency)

Your answer

---

2.2. The NFF is capitalized through

- Multiple sources from both public and private sources
- Multiple sources, either public or private (but not both)
- A single source only

2.3. Public/Domestic sources

- State budget
- Income from government forests
- Forest-related taxes
- Fines, penalties, and seizures
- Donations and grants
- Fees and taxes not tied to forest commodities
- Bonds
- Loans
- Other:

2.4. Average funds mobilized through public sources in the last 5 years. Please provide an average per year between 2014 and 2018 (in USD or local currency)

Your answer

---

### 2.5. Private sources

- Grants from private foundations
- High Net Worth Individuals donations
- Diaspora donations
- Corporate Social Responsibility (CSR) partnerships
- Private banks loans
- Impact funds loans
- Other: \_\_\_\_\_

2.6. Average funds mobilized through private sources in the last 5 years. Please provide an average per year between 2014 and 2018 (in USD or local currency)

Your answer

---

### 2.7. International sources

- Development banks
- UN agencies
- Bilateral cooperation
- REDD+ funds

2.8. Average funds mobilized through international sources in the last 5 years. Please provide an average per year between 2014 and 2018 (in USD or local currency)

Your answer

---

2.9. Is the NFF accredited for direct access to the Green Climate Fund (GCF)?

- No
- Yes
- In process of accreditation

2.10. Is the NFF accredited for direct access to the Adaptation Fund (AF)?

- No
- Yes
- In process of accreditation

2.11. Is the NFF an implementing agency of the Global Environment Facility (GEF)?

- No
- Yes
- In the process of accreditation

2.12. If the NFF is accredited for direct access to the GCF and/or AF and/or GEF, please describe main challenges in obtaining these accreditations and operating with these global funds

Your answer \_\_\_\_\_

2.13. Would you have recommendations to facilitate the interface between these global funds/ international funding and NFFs?

Your answer \_\_\_\_\_

### 3. NFF Utilization

This section investigates on how the NFF resources are utilized and spent.

3.1. Which financing instrument(s) are provided by the NFF ?  
(select all that applies)

- Grants
- Loans
- Payments for Ecosystem Services (PES)
- Compensation payments
- Direct payments for products/services
- Insurance
- Loan guarantees
- Public Private Partnerships
- Other: \_\_\_\_\_



3.2. Please provide an estimation on amounts spent/year in the last 5 years (per qualifying instruments, in USD or local currency)

Your answer

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3.3. If the NFF applies a PES approach, please specify for which ecosystem services (ES)?

Your answer

---

3.4. If the NFF applies a PES approach, who are the beneficiaries of the incentives ? (Individuals, associations, organizations, etc)

Your answer

---

3.5. Is the fund considered as a REDD+ fund?

Yes

No

3.6. Does the fund support implementation of the national REDD+ strategy?

Yes

No

3.7. Does the NFF contribute to the achievement of Land Degradation Neutrality (LDN) ?

Yes

No

3.8. Does the NFF contribute to achieving Aichi targets or NBSAP targets at country level?

Yes

No

3.9. The NFF is recognized as a contribution to (select all that applies)

A national or regional restoration initiative

Bonn Challenge commitments

Other ecosystem restoration pledges

3.10. Do you measure transactions costs?

Yes

No

3.11. If yes, how? And please share data on the transaction costs

Your answer

---

3.12. How many Hectares were restored and/or conserved through the NFF intervention? (in the last 5 years in the period 2014-2018)

Your answer

---

3.13. How many direct beneficiaries of the financial support could benefit from the NFF?

3.14. What types of beneficiaries are they?

- Individuals
- Households
- Associations
- Cooperatives
- Companies
- Other: \_\_\_\_\_

3.15. What share of funds in % is allocated to each category (as per beneficiaries selected above)

Your answer \_\_\_\_\_

3.16. Are there systems in place to secure land tenure rights, and payment entitlements?

Your answer \_\_\_\_\_

3.17. What type of land rights do NFF beneficiaries have? (specify)

Your answer \_\_\_\_\_

## 4. NFF Governance

This section investigates on how the NFF is managed and governed.

### 4.1. What is the NFF juridic form (please select)

- Account (as a separate account under an existing government budgetary provision)
- Public organization
- Association
- Foundation
- Enterprise
- Public company
- Trust fund
- Other: \_\_\_\_\_

### 4.2. Please characterize the NFF organization. The NFF is (please select)

- An independent organization outside state structures
- Its own organization within state structures
- Directly integrated within state structures (e.g. Ministry)

### 4.3. In the NFF Board, how many public sector representatives' seats are there?

Your answer \_\_\_\_\_

4.4. In the NFF Board, how many private sector representatives' seats are there?

Your answer \_\_\_\_\_

4.5. How many board meetings take place per year?

Your answer \_\_\_\_\_

4.6. How many staff are part of the management team? (in man/woman-year time)

Your answer \_\_\_\_\_

4.7. Of which, how many females ? (in woman-year time)

Your answer \_\_\_\_\_

4.8. And how many males? (in man-year time)

Your answer \_\_\_\_\_

4.9. How many staff are part of the execution team? (in man/woman-year time)

Your answer \_\_\_\_\_

4.10. Of which, how many females? (in woman-year time)

Your answer \_\_\_\_\_

4.11. And how many males? (in man-year time)

Your answer \_\_\_\_\_

4.12. How many offices at regional/provincial/district level does the NFF have?

Your answer \_\_\_\_\_

4.13. Please specify the decentralisation level of the NFF

Your answer \_\_\_\_\_

4.14. How many staff work at regional/provincial/district level? (in man/woman-year time)

Your answer \_\_\_\_\_

## 5. NFF Monitoring & Oversight

This section investigates on how the monitoring and oversight of the NFF is conducted.

5.1. NFF oversight is ensured through

- State oversight and independent external audit
- External state oversight
- Fund internal oversight

5.2. Is there a Result-based Payment (RBP) approach in place?

- Yes
- No
- Under development

5.3. If yes, please specify the RBP approach

Your answer

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5.4. Please describe main characteristics of the Monitoring & Evaluation (M&E) system

Your answer

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5.5. How is the M&E system connected to decision-making (board, management team, execution team)?

Your answer

---

5.6. Is there a Geographical Information System (GIS) in place to support the M&E system?

- Yes
- No
- Under development

5.7. If yes, please specify the characteristics of the GIS system

Your answer

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You have reached end of the survey. Many thanks for your participation! Please let us know any comments, additions or ideas you would like to share. Please keep us informed if you would be interested in receiving the results of the survey and related publications (contact : [ludwig.liagre@phd.unipd.it](mailto:ludwig.liagre@phd.unipd.it) / [ludwig.liagre@gmail.com](mailto:ludwig.liagre@gmail.com))

Your answer

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