

How can National Forest Funds catalyse the conservation of biodiversity and the provision of ecosystem services? Policy and management orientations through a comparative analysis between case studies in Costa Rica, Vietnam and Morocco.

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

Acronyms

CBD	Convention on biological diversity
ES	Ecosystem Services
FLR	Forest and Landscape Restoration
FONAFIFO	National Forest Financing Fund (Costa Rica)
M&E	Monitoring & Evaluation
M-NFF	Moroccan National Forest Fund
NFF	National Forest Fund
NFFs	National Forest Funds
PES	Payments for Ecosystem Services
PFES	Payments for Forest Ecosystem Services
RBP	Result-based payment
REDD+	Reducing Emissions from Deforestation and Forest Degradation
TEV	Total economic value
UCC	Costa Rican Carbon Units
VNFF	Vietnamese National Forest Protection and Development Fund
WTA	Willingness to accept
WTP	Willingness to pay

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Abstract

National Forest Funds (NFFs) represent a significant funding source for the forest sector globally. Mainstreaming biodiversity in these domestic financing instruments could be an opportunity to increase financing flows for biodiversity conservation and the provision of ecosystem services. An analysis of three NFF case studies (Costa Rica, Morocco and Vietnam) enables to assess with operational examples how far they already operate on Payments for Ecosystem Services approaches. The analysis highlights these funds all have PES-like characteristics, and NFF can play a sound intermediary role in quasi-PES approaches. While several countries are in the process to establish or reform an NFF, there is a window of opportunity to mainstream biodiversity objectives in NFFs including for PES-like schemes. A number of policy and management recommendations can thus be derived from the analysis to orient the NFF design or reform towards more contributions of these funds for biodiversity conservation and the provision of ecosystem services. The article will finally draw attention on how these orientations could be applied to one of the case study (Morocco).

1. Why National Forest Funds are potentially important for biodiversity conservation and the provision of ecosystem services? Recognizing there are more than 80 existing national forest funds (NFFs) worldwide, NFFs hold or manage an estimated USD 12–13 billion in developing countries (FAO, 2015, Rosenbaum & Lindsay, 2001). They can thus be considered as significant contributors to finance forestry projects and initiatives globally. As pointed out by Rosenbaum & 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”. FAO (2015) describes them as “dedicated financing mechanisms established with the main objective of supporting the conservation and sustainable use of forest resources”. Acknowledging about eighty percent of terrestrial biodiversity lives in forests (IUCN, 2012), national forest funds have a role to play in sustainable financing for biodiversity. The present publication will look in particular into the role of already functional NFFs in providing Payments for Ecosystem Services (PES) or PES-like types of support. The facilitation and activation role played by NFFs for PES-like mechanisms may have been undermined so far and may represent opportunities in the challenges ahead for biodiversity conservation and ecosystem restoration. And NFF may thus be considered as relevant financing tools in the framework of the Post 2020 global biodiversity framework and the upcoming United Nations Decade on Ecosystem Restoration 2021-2030. While many of the existing NFFs have design challenges and require reforms for more efficiency and impacts, including to deliver more Sustainable Development Goals (SDG) related impacts, we suggest to carefully derive lessons learned from three

operational case studies, which can provide solid policy and management recommendations to NFF managers, forest and environment administrations especially in developing countries context. As proposed by FAO & GIZ (2013) and FAO (2015) some of the key NFF features which will be considered in this analysis include: capitalization, governance, utilization and monitoring & evaluation (see figure 1).

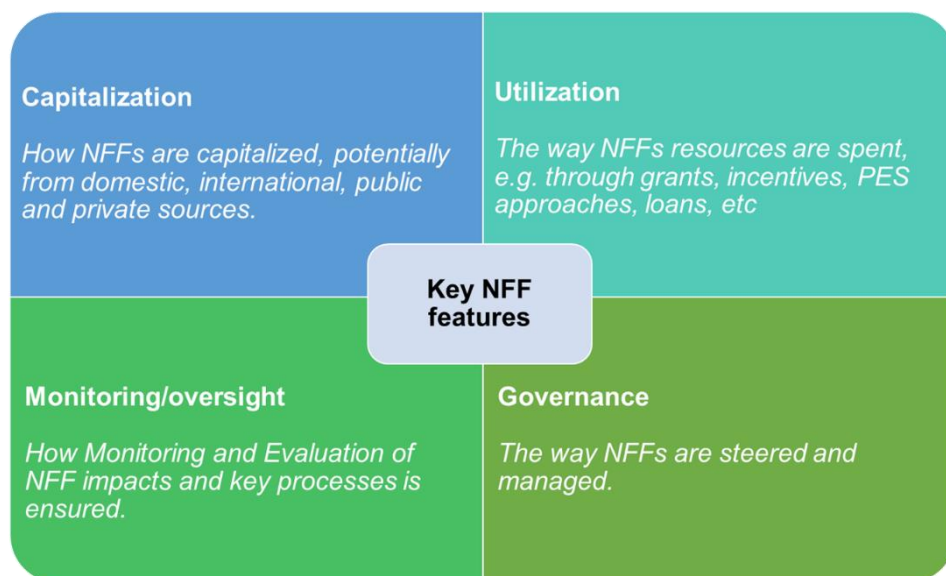


Figure 1: Key NFF features (derived from FAO, 2015 and FAO&GIZ, 2013)

2. Case studies in Costa Rica, Vietnam, Morocco: operational NFFs delivering on ecosystem services. The current analysis will focus on three NFF case studies which have been operational for many years. Figure 2 highlights key elements of the three cases.

Country	Costa Rica	Vietnam	Morocco
Name	National Forest Financing Fund (FONAFIFO) ³	Vietnamese National Forest Protection and Development Fund (VNFF)	National Forest Fund (M-NFF)
Legal underlying	Forestry law n°7575	Decree n°5 on VNFF Decree n°99 on PFES	Arrêté n° 1855-01
Legal form	Public entity (agency)	Public entity (agency)	Account
Fund type	Revolving	Revolving	Revolving
Operational since	1996	2008 (VNFF establishment); 2010 (PFES)	2002 (compensation mechanism)
Governance	Open (to multiple sectors)	Open (to multiple sectors)	Restricted (to forest administration and finance ministry only)
Decentralization	Yes, with regional offices	Yes, with provincial funds	No
Utilization	Economic incentives (PES-like)	Economic incentives (PES-like)	Compensation payment

Capitalization	Taxes (oil, water), CSR contributions, bilateral and multilateral funding	PES contributions from economic sectors (hydropower, water distribution, industry, ecotourism, etc)	Taxes on imported woods, other domestic forest related revenues
Capitalization/year⁴	~25 M USD	~50 M USD	~10 M USD/year
Oversight/M&E	Independent and external audit	Independent and external audit	Internal audit only

Figure 2: Cross-comparison of the Costa Rican, Moroccan and Vietnamese NFF

If the three models are different, they all have a legal underlying, operate as revolving funds, and provide economic incentives for the provision of ecosystem services (FONAFIFO and VNFF) or compensation payments (M-NFF). Below figures 3 and 4 provide more data on the capitalization and utilization of the three mechanisms.

The Fund for Forest Financing in Costa Rica (FONAFIFO)⁵ presents several remarkable characteristics:

- Ecosystem services to be paid for (biodiversity, water, carbon, landscape beauty) and the Payment for Ecosystem Services system are integrated in the forestry law;
- FONAFIFO is capitalized through diverse sources including an oil tax, water tariffs, and partnerships with the private sector;
- Direct individual payments are granted to households/farmers, as described in fig. 4.3. One of the success factors of this approach is the land ownership (land rights securitization) which covers the totality of the Costa Rican territory;
- Differentiated financial incentives are provided depending on ecosystem types or land use patterns;
- Decentralized offices for local management and technical assistance (regional FONAFIFO offices) enable a close support to the PES beneficiaries.

In the case of the Forest Protection and Development Fund (VNFF)⁶ in Vietnam, interesting characteristics include:

- An important level of decentralization, with the existence of provincial funds connected to the VNFF;
- A capitalization through diverse sources of financing, including REDD+ funds, extractive industries and hydropower companies contributions, tourism industry contributions, etc. Figure 3.1 highlights the different financing sources of the Vietnamese forest Payment for Forest Ecosystem Services (PFES) mechanism.
- Articulation of the PFES approach and REDD+ financing. A REDD+ trust fund operates under the umbrella of the VNFF in order to ensure synergies with other forest financing sources.
- Optimization of financing flows towards final beneficiaries, as shown in fig. 4.2. Only 0.5% are mobilized for administrative costs at the national level, and about 15% at the level of

⁴ Average in the last 5 years

⁵ www.fonafifo.go.cr

⁶ www.vnff.vn

provincial funds where the administrative management is more demanding. Thus between 75% and 85% of initial funds effectively reach local final beneficiaries.

In the case of the Moroccan National Forest Fund, several key characteristics are to be noted:

- The Moroccan NFF is mostly capitalized through a tax on imported woods, and other domestic sources. It is a good example of an NFF fully capitalized with domestic sources (fig. 3.3). Total capitalization amounts for more than 50% of total state budget for forestry.
- 90% of its capitalization is utilized for reforestation and forest ecosystems restoration. In this framework the Moroccan NFF allocates incentives to sylvopastoral associations in exchange of the respect for reforestation/forest restoration perimeters, so-called « compensation pour mise en défens ». 10% of the fund capitalization is used to finance forestry research activities in Morocco.
- Direct payments are provided to sylvopastoral associations. The compensation for forest protection enables to directly incentivize beneficiary groups (while it is the case for individuals with the FONAFIFO). Sylvopastoral associations engage for a period defined in a contract and receive annually a compensation payment directly in the association account. The incentive amount is 250 MAD/Ha/year (only for the argan ecosystem, the amount is 350 MAD/Ha/year, because of a higher opportunity cost with argan). Figure 4.1 highlights the growth of the beneficiaries number and surfaces protected in the past years.

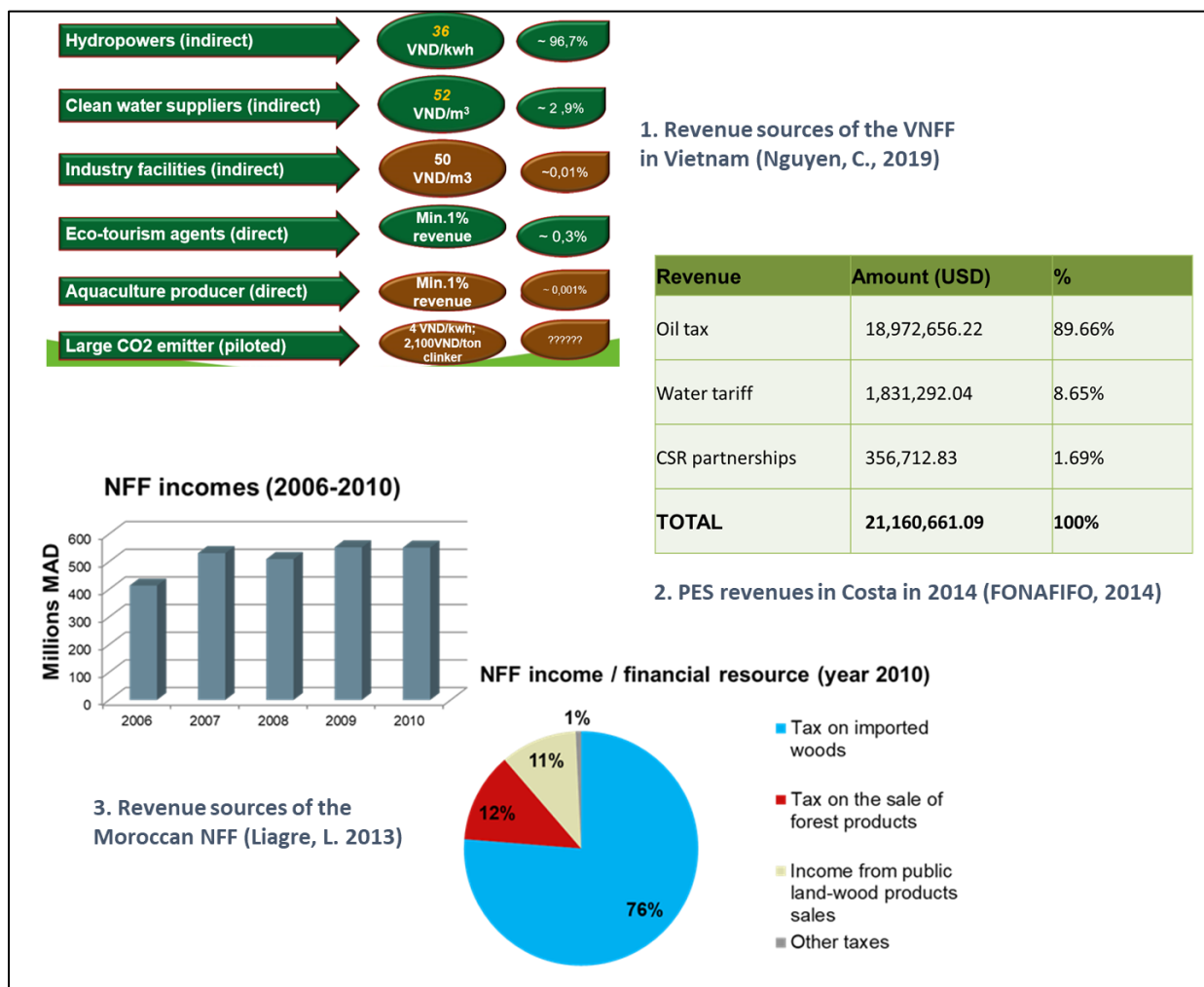


Figure 3: Sources of capitalization of the NFF in Costa Rica, Morocco and Vietnam

- Successful NFF operations are bound to a social engineering expertise developed by the Moroccan forest administration⁷ at all administrative levels. With this approach foresters are trained to support the sylvopastoral associations to define proper sylvopastoral practices and to use properly the compensation payments for alternative income generating activities limiting pressure on forest ecosystems.

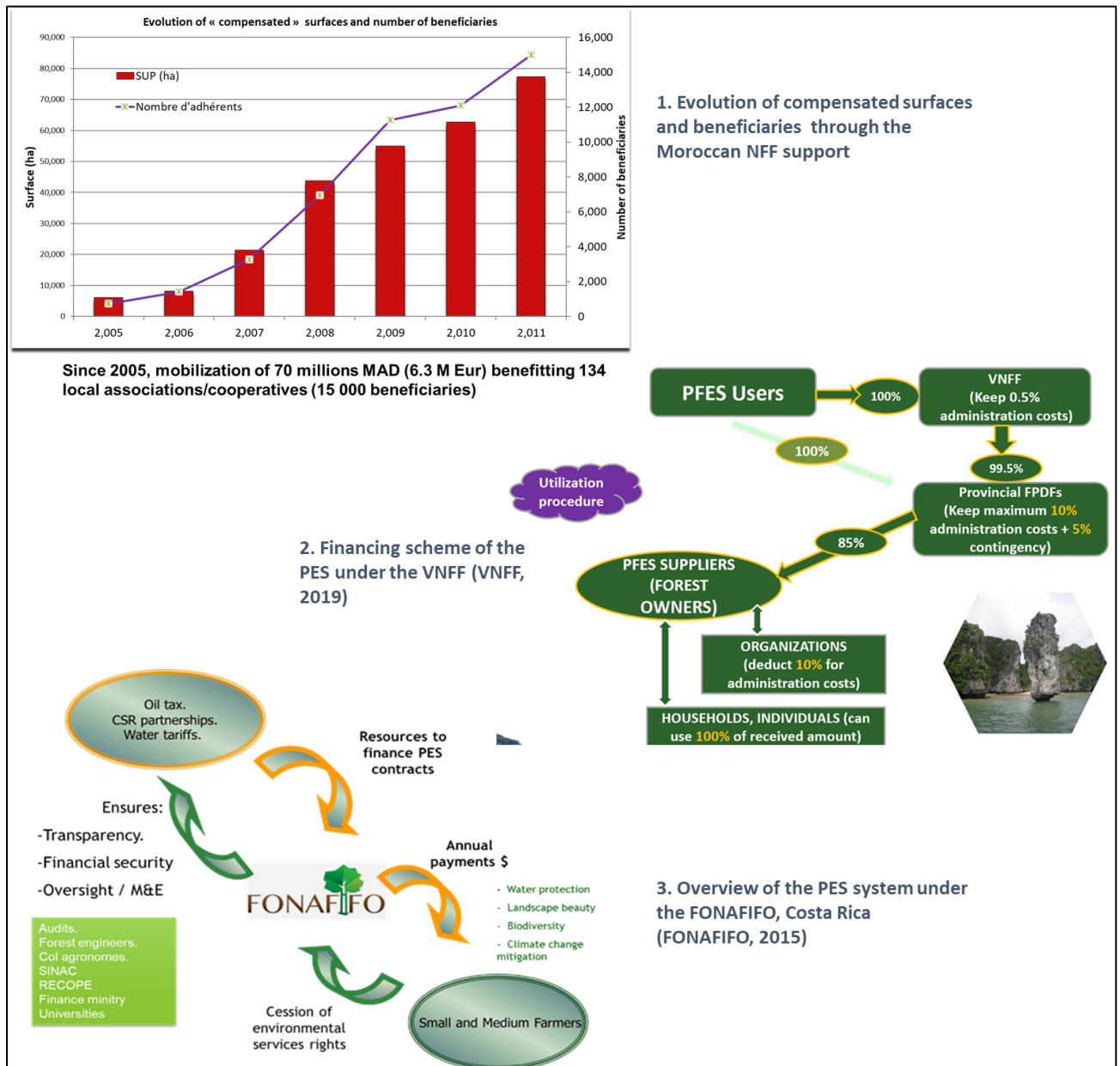


Figure 4: Data on NFF utilization in Costa Rica, Morocco and Vietnam

⁷ <http://www.eauxetforets.gov.ma/fr/index.aspx>

3. Do these NFF actually operate as Payments for Ecosystem Services? If these funds (in Costa Rica, Vietnam and Morocco) are different they are all targeting the delivery of ecosystem services (ES), but in different ways, and we will address the question of how far these mechanisms can qualify as PES schemes?

The pure PES definition (Wunder, 2005) tells us that a PES is: 1. a voluntary transaction where 2. a well defined ES (or a land-use likely to secure that service) 3. is being ‘bought’ by a (minimum one) ES buyer 4. from a (minimum one) ES provider 5. if and only if the ES provider secures ES provision (conditionality).

PES characteristic	Costa Rica	Vietnam	Morocco
Voluntary transaction	No (taxes systematically raised)	Partially (if PES contributions are originally negotiated with economic sector branches, they become mandatory)	No (taxes systematically raised)
Defined ES	Yes (list of eligible activities)	Yes (list of approved forest practices)	Indirectly (through opportunity cost)
ES buyer	Yes (citizens, corporates)	Yes (economic sectors and companies impacting forests negatively or benefitting from ES)	No
ES provider	Yes (individual farmers)	Yes (individual households, local associations and cooperatives)	Yes (sylvopastoral associations)
Conditionality	Yes (result-based payment)	Yes (result-based payment)	Yes (result-based payment)

Figure 5: PES characteristics of the Costa Rican, Moroccan and Vietnamese NFF vis-à-vis the pure PES definition

All the schemes comply only partially with the pure PES definition. Some of the characteristics are not fulfilled. So the schemes described above would qualify as quasi-PES (PES-like schemes) as specified by Masiero & Pettenella (2017). For example in the M-NFF case the buyer of the ES is not well

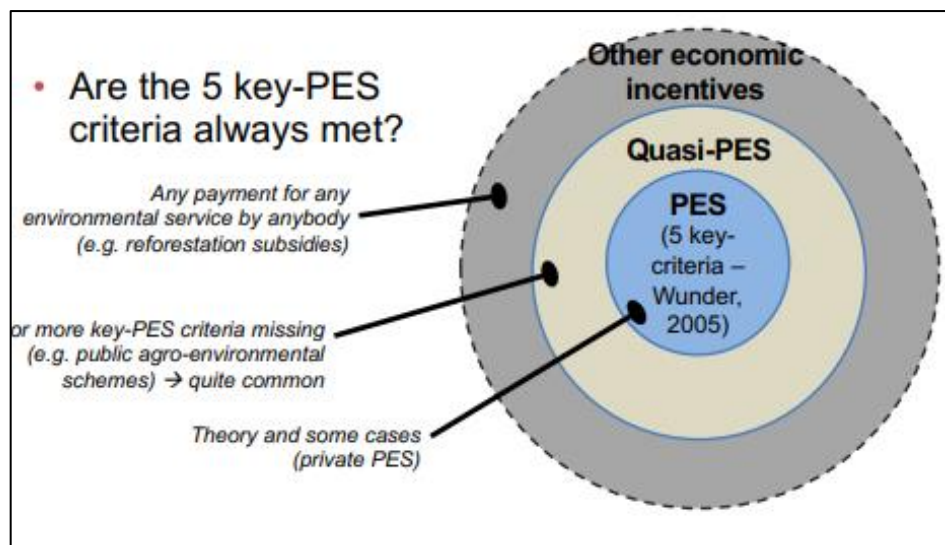


Figure 6: PES, quasi-PES and other incentives (Masiero & Pettenella, 2017)

defined as taxes are raised mainly on wood importers who would not directly benefit from a domestic PES scheme. In all cases the transaction is not voluntary as payments are mandatory either through taxes (Costa Rica and Morocco) or through mandatory contributions from companies and operators in specific economic sectors (Vietnam). In the case of the VNFF though the payments were originally defined through a negotiated process searching for the willingness to accept (WTA). Given this characteristic the Vietnamese case seems to be the most advanced national forest fund in activating a PES-like scheme (out of the 3 cases) on the ES buyer side.

So we can deduct from these examples that NFF 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. In all cases nonetheless the result-based payment ensures the conditionality of the PES-like approach. Figure 7 provides a simple conceptual view of the intermediary role played by NFFs for PES-like schemes.

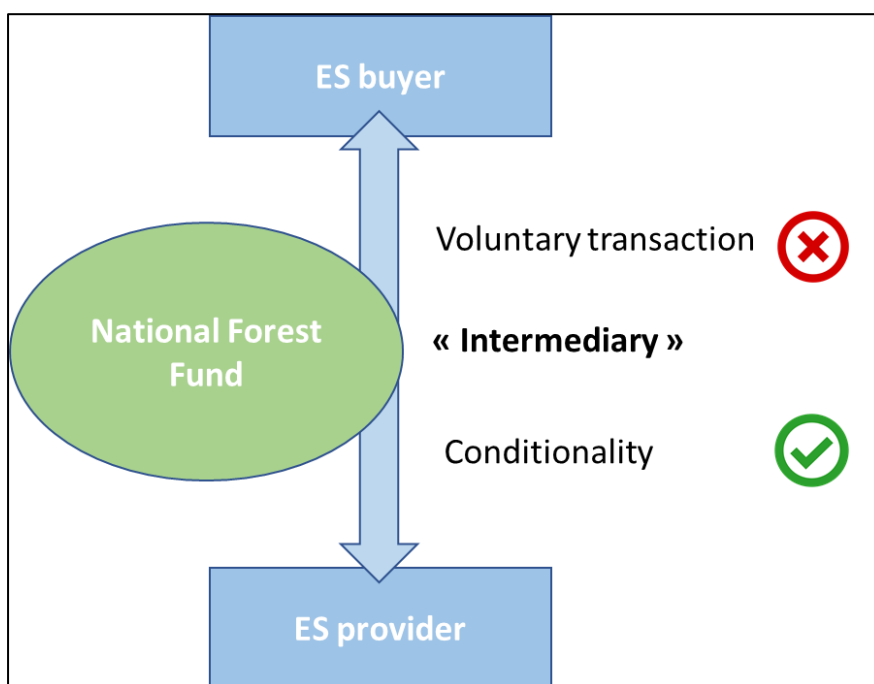


Figure 7: NFFs as PES-like scheme "intermediaries"

Further, analysing key PES preconditions as proposed by Masiero & Pettenella (2017) provides additional understanding on the relevance and sustainability of the proposed schemes (fig.8). 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 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.

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	Yes, RBP	Yes, RBP	Yes, RBP

	quality/quantity of the service			
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. How long will it remain in place after public funding is finished?	Sustainable financing (through predictable taxes)	Sustainable financing (through systematic annual contributions)	Sustainable 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

Figure 8: Analysing PES preconditions for the 3 case studies

Further it can be meaningful to look more in-depth into the PES-like characteristics of the three analysed case studies. Figure 9 highlights some of the key features of the PES-like approaches in the FONAFIFO, the M-NFF and VNFF. For example 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. Indeed the VNFF relates directly the economic sectors contributions to the benefit they have 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 (fig. 10). We may thus qualify the VNFF model as an “offer-side” PES-like scheme and the FONAFIFO as a “supply-side” PES-like mechanism, as suggested by Pagiola (2005).

	FONAFIFO	VNFF	M-NFF
PES rationale in the capitalization (“Offer-side PES”)	Indirectly (Non forest Taxes)	PES contributions from economic sectors and companies “polluter-pay principle” (towards ecological compensation)	Indirectly (Forest taxes)

		+” beneficiary-pay principle”	
Beneficiaries	Payments to smallholders/individual farmers	Payments to cooperatives/associations, and to individual farmers	Payments to sylvopastoral associations
Clearly defined ES (with ES prioritization) (“Supply-side PES”)	Yes (prioritization of ES and differentiated payment)	Indirectly through targeted ES with contributing economic sectors and operators	No
Definition of PES amounts	TEV, and a negotiation with beneficiaries on the WTA	A mix of cost of degradation, TEV, and a negotiation on the WTP/WTA	Opportunity cost
Valorisation of ecosystem services on markets	Yes with UCC (ecosystem services rights on carbon are retroceded to the FONAFIFO)	Indirectly through REDD+ financing	No
REDD+ valorisation	FONAFIFO plays a key role in the REDD+ implementation	A REDD+ trust fund has been created under the VNFF umbrella	No

Figure 9: PES-like approaches in the FONAFIFO, VNFF and M-NFF more in detail

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, 2019).







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

Figure 10: Examples of PES Modalities, FONAFIFO (FONAFIFO, 2015)

4. 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. Data would be useful to characterize this contribution, but only very limited information is available. A quick review of how biodiversity is taken into account in the three case studies is presented in fig. 11 and highlights that gaps are significant in the way NFFs integrate biodiversity in their M&E framework, thus limiting opportunities to unleash the potential of NFFs for biodiversity conservation.

Biodiversity mainstreaming elements	FONAFIFO	VNFF	M-NFF
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	No
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	-	-

Figure 11: Quick overview of biodiversity mainstreaming in the FONAFIFO, the M-NFF and the VNFF

For the time being only FONAFIFO explicitly integrates biodiversity in its M&E framework as highlighted in figure 11. 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 for example is home to the endangered barbary macaque.

With the ability to activate PES-like mechanisms, as seen in previous sections, it is clear that NFFs have a role to play for biodiversity conservation. Nonetheless the current lack of data on biodiversity in the M&E and reporting systems of these funds make it difficult to track precisely

NFFs related biodiversity benefits, and to fully tap into the NFFs opportunities for biodiversity conservation financing.

5. Which policy and management orientations can we derive from the analysis? With the previously made comparative analysis on the three NFF case studies and how they can activate PES-like mechanisms, we can identify a series of policy orientations targeting in particular countries willing to establish and/or reform an NFF. Figure 12 compiles these orientations.



Figure 12: Policy orientations to seize the NFF potential for biodiversity conservation and the provision of ES

Recognizing the full potential of NFFs for biodiversity conservation and the provision of ecosystem services, we will try to see in the Moroccan case for example what orientations could be integrated to unleash the M-NFF in delivering more on PES. It has been one of the objectives of a south-south cooperation project between Costa Rica and Morocco with GIZ

facilitation⁸. In this context, 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 derive from the previous analysis of this publication and from the GIZ study, and highlight elements also relevant for the Ifrane area.

N.B. Below orientations 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.

Feature	Reform orientations for the M-NFF
<p>Capitalization</p>	<ul style="list-style-type: none"> • Apply the polluter-pay and beneficiary-pay “principles” to mobilize economic sectors and operators with a PES rationale / Consider the PES approach on the offer-side Ecotouristic/touristic operators may be ready to contribute to a PES scheme, as well as the water distribution operator through water tariff. Besides local and national companies may be able to contribute, including through the Partnership for Moroccan Forests initiative (GIZ, 2015) • When meaningful, use the NFF for ES valorisation, including on established markets (e.g. with REDD+) 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). M-NFF may be a good intermediary in delivering REDD+ financing at local level as with the VNFF case • Develop a mixed capitalization approach to ensure self-financing and thus a permanence of the scheme 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.
<p>Governance</p>	<ul style="list-style-type: none"> • Reinforce the dialogue between the CBD focal point and the forest administration when they are not based in the same institution 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 (incl. the NBSAP objectives) • Open the governance to a variety of stakeholders, including diverse sectors, the private sector, and civil society representatives M-NFF governance is closed for the time being, ensured mostly by the forest administration itself. It is critical to open the governance of such a mechanism to engage more actively with the private sector and international donors, and other biodiversity-relevant stakeholders
<p>Utilization</p>	<ul style="list-style-type: none"> • Consider the PES approach on the supply-side / Prioritize ES and differentiate payments for an efficient use of resources

⁸ <https://www.giz.de/en/worldwide/28717.html>

	<p>For the time being the M-NFF and its compensation mechanism do not recognize ES per se, and they recognize only two forest ecosystem types (argan ecosystems where opportunity costs are the highest and other forest ecosystems). The diversity of forest ecosystem 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.</p> <ul style="list-style-type: none"> • Decentralize operation of the fund for a close support to local beneficiaries, and better control of ES provision <p>Even if local foresters in Morocco provide technical assistance to M-NFF beneficiaries groups (sylvopastoral associations), it could be meaningful to decentralize the M-NFF further, for example taking stock of the VNFF experience.</p>
<p>M&E</p>	<ul style="list-style-type: none"> • Define biodiversity indicators as part of the NFF M&E system <p>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)</p> <ul style="list-style-type: none"> • Develop safeguards systems to avoid leakages <p>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.</p>

Figure 13: Reform orientations for the M-NFF

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