



Food and Agriculture Organization
of the United Nations

Payments for forest environmental services in sub-Saharan Africa

A practical guide



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By

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
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Foreword

This publication responds to calls in various regional and global forestry forums to strengthen capacity for effectively developing and implementing payment schemes for environmental services in sub-Saharan Africa. In particular, the African Forestry and Wildlife Commission, at its 18th session, called for the enhancement of the institutional capacities of member countries and the sharing of knowledge on payment schemes for forest environmental services at the national and subregional levels.

The publication focuses on forest-based environmental services, such as carbon sequestration, watershed protection and biodiversity conservation. It comes at a time when forests are at the centre of global responses to the challenge of climate change and when payment schemes for forest environmental services are increasingly seen as a valuable means of generating revenues for local economic development from sustainable forest management. The publication compiles lessons applicable in sub-Saharan Africa generated by initiatives in the subregion and in other regions relevant to sub-Saharan Africa. It is designed as a practical reference covering all the main topics related to payment schemes for forest environmental services, from the basics of quantifying and valuing those services to the arts of market development and stakeholder engagement. FAO hopes that a better understanding of these dimensions and associated practical lessons will facilitate the growth of payment schemes for forest environmental services, from the few existing local and small-scale initiatives to large-scale self-sustaining programmes at the national level.

The long-term objective of this capacity building effort is to augment financial resources for sustainable forest management by increasing the recognition and appreciation of the benefits of trees, forests and forestry. As such, this publication elaborates on various strategies for mobilizing investments for conserving and increasing the economic, social and environmental values of forests while enhancing benefits for African communities. By sharing success stories, the publication demonstrates how appropriate economic incentives can enable the transfer of financial resources from the beneficiaries of environmental services to those who provide them. It also seeks to empower national governments to play catalytic roles in ensuring that the full range of economic values of forests is reflected in the marketplace.



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Acronyms

AFOLU	Agriculture, forestry and other land uses
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CCB	Climate, Community and Biodiversity
CCBA	Climate, Community and Biodiversity Alliance
CDM	Clean Development Mechanism
COMACO	Community Markets for Conservation
ECOTRUST	Environmental Conservation Trust of Uganda
FONAFIFO	National Forestry Financing Fund
FPIC	Free, Prior and Informed Consent
FSC	Forest Stewardship Council
LIFE	Living in a Finite Environment
MtCO ₂ e	Megatonnes of carbon dioxide equivalent
NFA	National Forestry Authority (Uganda)
NGO	Non-governmental organization
PES	Payments for environmental services
REA	Reciprocal environmental agreement
REDD+	Reducing emissions from deforestation, forest degradation, conservation, sustainable management of forests and enhancement of carbon stocks
tCO ₂ e	Tonnes of carbon dioxide equivalent
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
VCS	Voluntary Carbon Standard

1 Introduction

Worldwide, payments for environmental services (PES) have been identified as a major potential means to augment finance for sustainable forest management (FAO, 2012), conserve forests in agricultural landscapes, and ensure the continued provision of environmental services important for food production. PES schemes are emerging as part of efforts by businesses, public-sector agencies and non-profit organizations to address environmental issues. Such payments are a new source of income for land management, restoration, conservation and sustainable use and therefore have significant potential for promoting sustainable ecosystem management (Herbert *et al.*, 2010). The use of markets and market-based mechanisms to conserve and pay for environmental services, especially those related to carbon, water and biodiversity, is a growing global trend that is gaining a solid foothold. PES schemes are no longer solely the domain of environmentalists; they are becoming of vital interest to small local communities, government regulators, businesses and financiers worldwide. PES schemes encompass innovative private deals and government programmes structured around the premise that natural ecosystems provide valuable services and that paying landowners and other stakeholders to provide such services can help ensure their continuance while generating income for those willing to participate.

The 2013 report of the Ecosystem Marketplace (Peters-Stanley, Gonzalez and Yin, 2013) reported that global markets for carbon offsets from agriculture, forestry and other land-use projects transacted 32.7 megatonnes of carbon dioxide equivalent (MtCO_{2e}) in 2013, a 17 percent increase compared with 2012 and equal to transactions in 2010. The report also found that the cumulative market value of such transactions topped US\$1 billion in 2013, although the annual value of US\$192 million in 2013 represented a decline of 11 percent compared with 2012 as average offset prices fell from US\$7.80 per tonne of CO_{2e} (tCO_{2e}) to US\$5.20/tCO_{2e}. Forest carbon projects provided many “beyond carbon” benefits in 2013, including 9 000 jobs; the protection of 13 million hectares of habitat for endangered species; and US\$41 million in funding for education, health care and infrastructure.

Nevertheless, while the concept of PES is of major interest to local communities, governments and forest investors, actual PES schemes in sub-Saharan Africa are still mostly small and scattered, and the participation of African players in the voluntary carbon market is marginal. For example, the 2013 Ecosystem Marketplace report was based on information from 39 countries, only five of which were in Africa (Peters-Stanley, Gonzalez and Yin, 2013).

There is an urgent need to equip communities in sub-Saharan Africa with the skills to participate in this growing market. Various recent regional and global forestry forums have highlighted some barriers to such participation. In particular, the African Forestry and Wildlife Commission, at its 18th session, called for the enhancement of the institutional capacities of member countries and the sharing of knowledge on payment schemes for forest environmental services at the national and subregional levels. Stronger institutional capacity is vital for the development and implementation of effective PES mechanisms, which require significant analytical, political and management skills.

Developing PES schemes in sub-Saharan Africa will help promote market-based mechanisms in which the beneficiaries of forest environmental services provide incentives for the continued provision of those services. Several governments in the subregion are pursuing policies to reduce or ban commercial logging, and there is a constant search for ways to generate alternative sources of income for forest-dependent people. This publication seeks to contribute to this search by sharing examples of clear strategies that have been applied by countries in sub-Saharan Africa and elsewhere (especially Latin America) in the implementation of PES mechanisms, with a focus on forest-based PES schemes.



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Photo 1: Forest resources in the Central African Republic

Target audience

This document is intended mainly for policymakers, project developers and implementers in Africa. It aims to encourage organizations and communities to explore PES and, where appropriate, apply the concept to further their goals for conservation, restoration, income generation and sustainable ecosystem management.

Objectives

This document is intended to enhance the capacities of key stakeholders in sub-Saharan Africa by providing practical guidance on the implementation of PES schemes. Its focus is on PES schemes involving forests; however, given that most schemes are not limited to forest environmental services, the more general term PES is used here. This document shares experiences in the subregion and other regions relevant to the sub-Saharan context, with a view to creating broader awareness and increasing knowledge of the practicalities of developing and governing PES schemes. Specifically, this publication is expected to promote knowledge and

understanding of the key factors in the success of PES and foster information-sharing on best approaches and practices at the subregional level. The long-term objective is to augment financial resources for sustainable forest management by increasing the recognition and appreciation of the benefits of trees, forests and forestry.

This document is organized as follows:

- **Chapter 2** introduces the PES concept, including the key principles that underpin scheme development, and the types of PES scheme. A table summarizes case studies from existing initiatives in sub-Saharan Africa and Latin America from which lessons applicable in sub-Saharan Africa have been derived.
- **Chapter 3** describes how PES schemes work in the sub-Saharan African context, including PES categories and the essential conditions that provide an enabling environment for PES schemes.
- **Chapter 4** provides step-by-step advice for the design of PES schemes. The process comprises the following six steps: 1) create an enabling environment; 2) conduct a feasibility assessment; 3) consult stakeholders; 4) develop the project idea; 5) determine the means of valuation and the attribution of environmental services; 6) develop a monitoring and verification plan; and 6) negotiate and implement PES agreements.
- **Chapter 5** provides insights into the implementation of a PES scheme, starting with the mobilization of resources for scheme development and market engagement. The chapter reviews strategies that have been applied to ensure the equitable sharing of benefits, as well as to ensure that the desired environmental services are being delivered.
- **Chapter 6** examines risk management in the context of PES schemes.

2 Introduction to payments for environmental services

Ecosystem services versus environmental services

Although the terms “ecosystem services” and “environmental services” are often used interchangeably, one (environmental services) is a subset of the other (ecosystem services). The Millennium Ecosystem Assessment (2005) defined ecosystem services as “benefits received from nature, satisfying human needs without neglecting other species requirements and without being internalized in economic decisions, thus externalities”, and it categorized them according to three broad functional categories (summarized in Box 1): 1) provisioning; 2) regulating; and 3) cultural. Figure 1 provides examples for each of these categories and illustrates the relationship between the categories and human well-being. The term “environmental services” refers to the services of watershed protection, biodiversity conservation, atmospheric regulation (including greenhouse-gas mitigation) and landscape beauty (e.g. see Pagiola and Platais, 2002). Forests also deliver a number of important regulating services; for example, they constitute important habitat for pollinators and for natural enemies that can reduce the severity of outbreaks of agricultural pests. Forests also provide important dietary diversity for local people, who depend on non-wood forest products for their dietary needs to a much greater degree than is often understood – for example, African children living in areas with heavy tree cover tend to have more nutritious diets.

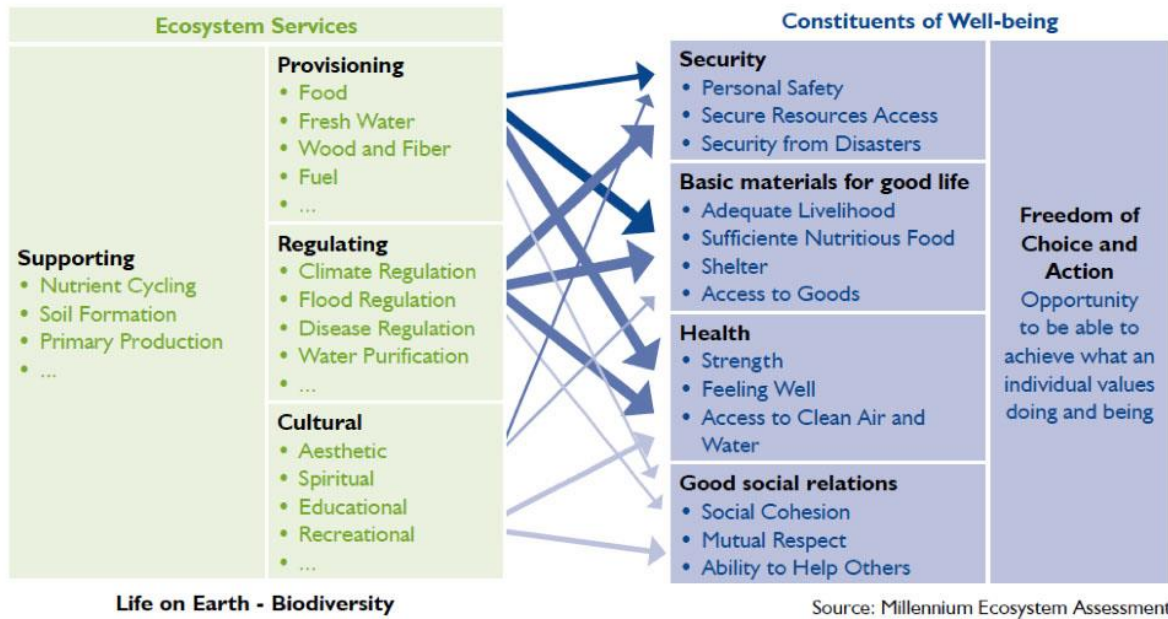
In practice, the main difference between ecosystem services and environmental services is the inclusion or exclusion of provisioning ecosystem services. Most provisioning ecosystem services – e.g. food, fibre and timber – are excludable and non-competitive goods for which markets develop readily. This document focuses mainly on environmental services, for which markets do not develop easily; it also focuses on *forest* environmental services although, as noted in Chapter 1, it uses the acronym “PES” because most schemes encompass environmental services produced on both forested and non-forested lands.

BOX 1 Categories of Ecosystem Services

- **Provision Services** - refer to the ability of ecosystems to supply materials such as food, fibre, genetic resources, natural medicines and fresh water.
- **Regulatory services** - refer to the capacity of ecosystems to regulate, for example air quality, climate, erosion, water purification, pollination and natural hazard regulation.
- **Cultural services** - refer to spiritual and religious values, aesthetic values, recreation and ecotourism.

Note that environmental services comprise “regulatory” and “cultural” services.

FIGURE 1
Linkages between ecosystem services and human well-being



What are payments for environmental services?

“Payments for environmental services” are voluntary transactions in which a well-defined environmental service or a form of land use likely to secure that service is bought by at least one buyer from a minimum of one environmental-service provider, if and only if the provider continues to supply that service (adapted from Wunder, 2005). Payments for *forest* environmental services are therefore transactions that involve environmental services accrued from forestry as a form of land use. Put simply, a PES scheme is a counter at which a beneficiary pays landowners or land users for choosing to maintain (or increase) the stream of environmental services through good ecosystem management. The concept is based on the assumption of a perfectly competitive market in which the sellers of the environmental (i.e. forest) service is paid approximately the equivalent of the opportunity cost of alternative land uses or management regimes they might otherwise put in place. In addition, buyers are assumed to pay no more than the value of the services received from the ecosystem.

In practice, variations on this ideal situation may apply. In many cases, for example, users of environmental services may be obligated by law to pay (e.g. in regulated markets), which is contrary to the voluntary nature of the ideal case. Box 2 lists some key principles and concepts underpinning the definition of PES.

BOX 2

Key principles and concepts that underpin payments for environmental services

- **Voluntary:** stakeholders enter into agreements on PES on a voluntary basis.
- **Beneficiary pays:** the beneficiaries of environmental services (individuals, communities and businesses, or governments acting on behalf of various parties) pay for those services.
- **Direct payment:** payments are made directly to the providers of the environmental services (in practice, often via an intermediary or broker).
- **Additionality:** payments are made for actions over-and-above those that land or resource managers would generally be expected to undertake (note that precisely what constitutes additionality varies from case to case, but the actions paid for must at least go beyond regulatory compliance).
- **Conditionality:** payments are dependent on the delivery of the environmental services. In practice, payments are most often based on the implementation of management practices that the contracting parties agree are likely to give rise to these benefits.
- **Ensuring permanence:** management interventions paid for by beneficiaries should not be readily reversible, thus providing continued service provision.
- **Avoiding leakage:** payment schemes for environmental services should be set up in ways that avoid leakage (in which securing an environmental service in one location leads to the loss or degradation of environmental services elsewhere).

Why payments for forest environmental services?

PES is a relatively new approach to attaching economic value to and possibly establishing real markets for environmental services (Forest Trends, Katoomba Group and UNEP, 2008). Environmental services are invariably connected to human well-being, both *in-situ* (i.e. within the local setting, such as water purification) and at the regional or even global levels (e.g. carbon sequestration) This section presents some of the characteristics that can make PES schemes good tools for forest conservation and management, including by showing the contributions of forests to human systems.

Highlighting the value of forests

PES schemes can bring about a greater appreciation and recognition of the value of forests as, for example, carbon sinks, regulators of local climates, and providers of genetic materials and bioenergy. This has occurred in Costa Rica, where landowners are paid to protect forests in return for the benefits they provide, such as conserving wild species, regulating river flows and storing carbon.

In Ghana, opportunity-cost and replacement-cost techniques have been used to estimate the value of forests in relation to dependence on forest resources (Appiah *et al.*, 2009). The replacement-cost technique generates a value for the benefit provided by an environmental good or service by estimating the cost of replacing the benefit with an alternative good or service (Bishop, 1999). The opportunity-cost technique estimates the cost of “doing nothing” – in this case, leaving degraded forests to become further degraded through, for example, unsustainable farming and bushfires (Appiah *et al.*, 2009).

Support for policy implementation

Several countries in sub-Saharan Africa have established forest conservation-related policies, or are signatory to international or multilateral agreements, that are poorly implemented. PES is a

potentially useful tool for domesticating international arrangements and implementing existing policies and agreements. A number of on-going national policy efforts, such as the REDD+ preparedness processes and strategies¹, could also benefit from PES approaches. Unlike in sub-Saharan Africa, where most existing PES initiatives are in the form of projects, PES has been applied in Latin America as a policy instrument, and this has enabled the development of successful national-level PES schemes. Costa Rica, for example, identified the need to improve the protection and management of national forest resources and established policies that introduced a PES scheme and created a market for environmental services.

Supporting sustainable livelihoods

In most countries in sub-Saharan Africa, the survival of the majority of people depends on forest environmental services that enable subsistence agriculture and ensure safe drinking water and on forest products for housing, energy and food security. For example, more than 80 percent of people in the subregion depend on wood for their energy needs. In addition to benefiting local people, forests in sub-Saharan Africa provide environmental services at the regional and global levels, and PES schemes constitute an opportunity to ensure the provision of such services while boosting the income and livelihoods of local communities. For example, PES schemes can be designed to support adaptation to climate change as an alternative to previous climate-change adaptation initiatives, which have tended to concentrate on the design of climate-resilient infrastructure and other engineered structures. In essence, healthy ecosystems are a natural buffer to the adverse impacts of climate change in vulnerable communities.

Rewarding good stewardship

PES schemes provide market-based incentives for communities to manage ecosystems sustainably; they can provide avenues through which the beneficiaries of the environmental services provided by forests in sub-Saharan Africa can contribute to the provision of those services, thereby easing the financial burden on governments and local communities. Governments can use the income generated by PES schemes to motivate community involvement in forest management and protection through a sustainable system to distribute payments equitably and with best effect.

Resource mobilization

The PES concept recognizes that countries in sub-Saharan Africa need sustainable financing mechanisms to reduce poverty and provide incentives for managing, restoring and protecting ecosystems on which people depend for food security and nutrition. PES schemes can provide a source of funding for land management, restoration, conservation and sustainable use. Through PES, governments and other actors can augment the financial resources required to co-fund sustainable land-use practices that provide biodiversity conservation, climate regulation and watershed services. Costa Rica has used PES successfully to mobilize significant resources at the national and international levels for forest management and protection. In sub-Saharan Africa, many conservation trust funds have been established in sub-Saharan countries but have not yet been capitalized: PES schemes could provide an avenue for mobilizing finance for such trust funds. PES processes can also help harmonize conservation trust funds at the national level; for example, several funds could be consolidated into a single fund with a diverse portfolio capable

¹ REDD+ = reducing emissions from deforestation and forest degradation through conservation, sustainable management of forests and enhancement of carbon stocks.

of tapping into various funding sources. In addition to mobilizing financial resources for forest conservation, PES can be used to mobilize expertise to address forestry issues, especially through multi stakeholder platforms. A good example of this is the Kenya Water Fund, which has been developed with inputs from experts from various sectors.

A win–win for stakeholders

PES schemes can be used as a tool for delivering measurable benefits in ways that are “win–win” for all stakeholders. PES is increasingly being used to link farmers who improve their land management practices (for their own benefit) with others who also benefit from such actions. With careful design, farmers and other parties can all achieve tangible benefits. For example, water utilities benefit from cleaner water through improved catchment management in the Plurinational State of Bolivia; private companies in Sweden offset carbon emissions in reforestation projects in Mexico, Nicaragua and Uganda; and international organizations support conservation in Costa Rica.

Building capacity in forest management

The implementation of PES schemes will help build the capacity of local actors to engage actively in managing and protecting forests. It will also help increase capacity at the local-to-national level in the design of institutional architecture, awareness-raising, and participation in policy dialogues and negotiations, including at the international level.



Photo 2: Pollination by honeybees is a type of ecosystem service.

Examples of PES schemes

Latin America

In some countries in Latin America, PES has become the main ingredient in a home-grown recipe for forest conservation. Several government-initiated PES schemes have achieved tangible benefits for farmers and other parties. Costa Rica began its pioneer scheme in the 1990s, in which landowners were paid to protect forests because of the social and environmental benefits they provide, such as conserving wild species, regulating river flows and storing carbon. Since 1997, nearly 1 million hectares of forest in Costa Rica have been part of these PES schemes. Forests now cover more than 50 percent of the country’s land area, up from a low of just over 20 percent in the 1980s (Herbert *et al.*, 2010).

In the Plurinational State of Bolivia, the Bolivia Nature Foundation uses reciprocal environmental agreements (REAs) in which water utilities pay for the benefits they receive (i.e. cleaner water) from improved catchment management. REAs are used as a mechanism for conserving key ecosystems while simultaneously diversifying local livelihoods and encouraging the efficient, responsible use of water. The mechanism behind REAs is straightforward: people downstream who depend on water resources generated upstream agree to contribute to a local conservation fund, which is then used to support upstream communities in building productive and sustainable livelihoods while conserving forests critical for maintaining or improving water quality and quantity. Three core players contribute to these local funds: the water cooperatives of downstream communities; municipal governments; and the Bolivia Nature Foundation.

Sub-Saharan Africa

Table 1 provides examples of PES schemes in sub-Saharan Africa, the lessons from which have greatly influenced the development of this document.

TABLE 1
Examples of payment schemes for forest environmental services in sub-Saharan Africa

Example	Description	Environmental services provided
CAMPFIRE – Communal Areas Management Programme for Indigenous Resources (Zimbabwe)	Community-based natural resource management programme, in which power is transferred from central government to local communities. The income from the sale of wildlife safaris is shared between the local administration and local communities	<i>Biodiversity conservation:</i> rural district councils, on behalf of communities on communal land, are granted the authority to sell access to wildlife in their districts to safari operators
Communal conservancies (Namibia)	The government created legislation giving communities the power to create their own conservancies. The communities benefit from tourism income	<i>Biodiversity conservation:</i> these are communal conservation areas, the majority of which lie adjacent to the government’s protected-area networks, increasing the continuity between protected areas and providing migration routes for elephants and other large range animals
Mgahinga Bwindi Forest Conservation Trust (Uganda)	A public fund, in which communities obtain grants for development projects (e.g. schools, hospitals, livelihood improvements and roads)	<i>Biodiversity conservation:</i> targeting the improved management of forests that constitute habitat for more than half the global population of mountain gorillas. This is a partnership with communities living in and around the Mgahinga National Park, the Bwindi National Park, and the Uganda Wildlife Authority
Canopy walk at Kakum National Park (Ghana)	Revenue-sharing arrangement between the park and local communities	<i>Biodiversity conservation:</i> seeks to incentivize community management in natural forests by sharing revenue from ecotourism
Bigodi Wetland Sanctuary (Uganda)	A private deal between the Kibale Association for Rural and Environmental Development, a local non-governmental organization and local communities, with support from the United Nations Environment Programme. Tourists pay members tour-guiding fees	<i>Biodiversity conservation:</i> mobilizes involvement in the co-management of the wetland and reducing pressure on the Bigodi Wetland Sanctuary. Communities are involved in the provision of tour-guiding services
Cerderberg Conservancy (South Africa)	A stewardship programme that consolidates 22 properties in central Cederberg as one of the core corridors of the Greater Cederberg Biodiversity Corridor	<i>Biodiversity conservation:</i> a voluntary agreement between landowners to manage the environment sustainably. Conservation goals are achieved through cooperation and dedication towards the conservation of nature on private land. The

		stewardship programme ensures that landowners who commit their property to a stewardship option will enjoy tangible benefits for their conservation actions
Uganda Nile Basin Reforestation Project (Uganda)	Clean Development Mechanism afforestation/reforestation project. Communities form groups that buy shares in the carbon benefits. Payments are based on these shares	<i>Climate services</i> in the form of certified greenhouse-gas emission reductions. These are generated through community involvement in the management of a forest reserve
Trees for Global Benefit (Uganda)	Plan Vivo voluntary carbon scheme. Income from the sale of carbon credits goes directly to participating households	<i>Climate services</i> with livelihood and biodiversity conservation benefits. Works with small-scale landholder farmers, rewarding them for increasing carbon stocks on their land through tree-planting
Bukaleba Forest Project (Uganda)	Registered under the Voluntary Carbon Standard, the Climate, Community and Biodiversity standard and Forest Stewardship Council certification. The communities benefit from support given to development projects	<i>Climate services</i> : The project is implemented on land within the Bukaleba Central Forest Reserve
Kasigau Corridor REDD+ project (Kenya)	Registered under the Voluntary Carbon Standard and the Carbon, Community and Biodiversity standard. This is a partnership between Wildlife Works and various landowners in the corridor between two national parks – Tsavo East and Tsavo West. Communities benefit from employment, and landowners are paid for the sale of carbon credits	<i>Biodiversity conservation</i> and <i>climate services</i> : applying REDD+ as a tool for protecting threatened forests, wildlife and communities
Lesotho Highlands Water Project (border between Lesotho and South Africa)	The two countries signed a treaty in 1986 to transfer 780 000 million litres of water and generate 72 megawatts of hydropower at the Muela Power Station. South Africa pays royalties to Lesotho for this water, using revenues generated by water sales	Lesotho provides water from the Senqu River system to South Africa’s economic hub, the water-stressed Gauteng region. The water en route to South Africa is put to good use, powering an underground hydroelectric power station that generates electricity to meet Lesotho’s needs. The agreement stipulates environmental protection and the sustainability of the river system
Upper Tana–Nairobi Water Fund (Kenya)	A public–private partnership involving a public utility company and communities. The public utility company contributes to an endowment fund, the income from which is invested in conservation work	<i>Watershed services</i> : downstream users of water raise resources to support watershed and other sustainable land management practices that benefit upstream local communities and improve the quality and reliability of water delivered downstream. The project is facilitated by The Nature Conservancy
Kibale Forest Wild Coffee (Uganda)	A private venture involving the Uganda Coffee Trade Federation (succeeded by the Kibale Forest Foundation) and residents of six villages located on the north-eastern border of the Kibale National Park. Farmers get paid through premium prices for their coffee	<i>Biodiversity conservation</i> : communities are committed to conservation practices that mitigate the threat to biodiversity in both the core conservation zone and the buffer zone. The scheme provides a self-sustaining incentive for biodiversity conservation in agricultural landscapes

<p>Community Markets for Conservation (COMACO) (Zambia)</p>	<p>Private deal between COMACO and private farmers to adopt organic farming practices and pledge not to poach or make charcoal illegally while farming with COMACO. Communities benefit from access to markets. In addition, farmers earn conservation points, and, at the end of year, are paid according to the number of points earned</p>	<p><i>Wildlife conservation:</i> COMACO rewards farmers with increased commodity prices for adopting improved land management and farming practices that can sustain higher food crop yields while reducing conflicts with natural resources. COMACO produces “IT’S WILD!”, a brand of organic, value-added processed products produced by farmers who live with wildlife</p>
<p>Cash for Assets Programme</p>	<p>A conditional cash transfer scheme that reaches food-insecure households in arid and semi-arid counties in eastern and coastal Kenya, where recipients work on community assets to build resilience against drought</p>	<p>Joint programme between the World Food Programme and the Government of Kenya. Communities are paid to implement new soil and water conservation technologies (e.g. constructing negarims and zai pits on their farms). Recipients must work toward development of a community asset, providing proof of work completed. Communities work on projects involving rainwater harvesting for human and livestock use, soil and water conservation, the rehabilitation of degraded land, and the production of drought-tolerant crops</p>

What is a PES transaction?

A PES transaction normally refers to contractual arrangements and negotiated agreements between ecosystem stewards and environmental-service beneficiaries or intermediaries for the purpose of enhancing, maintaining, reallocating or offsetting damage to environmental services. The key characteristic of PES schemes is that the focus is on maintaining the provision of a specified environmental service (such as clean water, biodiversity habitat, or carbon sequestration capabilities) or more than one such service in exchange for something of economic value. This may not be money: the essential characteristic is that the scheme causes a benefit to occur where it would otherwise not have occurred. That is, the service is “additional” to the business-as-usual scenario, or, at the very least, the service can be quantified and tied to the payment (Herbert *et al.*, 2010).

PES schemes have been distinguished from integrated conservation and development projects on the grounds that PES schemes are direct, cost-effective and less complex institutionally and therefore more likely to produce the desired results. The ability of PES schemes to produce desired results lies in their conditionality – they rely on incentives to induce behavioural change (Kelsey, Kousky and Sims, 2008).

3 How payment schemes for environmental services work

PES schemes do not occur in a vacuum but rather within a legal and institutional context. This chapter provides insight into the essential components of an enabling environment for successful PES. Box 3 summarizes these components.

BOX 3

Summary of essential enabling conditions for effective payment schemes for forest environmental services

- Existence of a supportive legal and regulatory context for the implementation/introduction of forest-based PES. Regulations include those that clarify tenure rights and the right to sell environmental services, enable the distribution of benefits, and govern the trade
- Rules for markets or trade (what is being sold, who is buying and who is being paid)
- Enabling tenure conditions (related to policy), with means for establishing validity of tenure, ownership, decision-making and access rights
- Accountability, transparency, and conflict and grievance redress
- A willing (structured) community or other set of stakeholders with a common vision
- Supporting institutions, services (intermediaries, verification, financial institutions, etc.) and governance
- A healthy forest (ecosystem), or prospects thereof
- Trust funds

Legal and regulatory context

Successful PES schemes require supportive legal and regulatory frameworks to provide clarity on tenure, the right to sell, market establishment, conflict resolution, supporting institutions and governance. These frameworks need to take into account the multidisciplinary nature of PES schemes, with the various facets governed by potentially a host of legal arrangements. Successful PES schemes, therefore, require the harmonization of relevant laws. Some countries in sub-Saharan Africa have demonstrated that the development of specific legislation can lead to the creation of PES markets. For example, the Government of Namibia introduced legislation in 1996 giving communities the power to create their own conservancies, thereby enabling them to manage and benefit from wildlife on communal land and to work with private companies to create and manage their own tourism markets. This created an environment in which PES transactions could be designed. Ten years later, in 2006, 44 communal conservancies were in operation, in which members were responsible for protecting their resources (especially wildlife populations) sustainably for game hunting and ecotourism revenues.

These and other participatory forest management initiatives provide lessons that can be used to identify ways of improving policies to create an enabling environment for PES schemes. Sub-Saharan African governments should ensure that policies not only govern who has the right to trade, and how they may do so, but also that adequate social and environmental safeguards are in place against negative impacts. In particular, there is a need to establish mechanisms to protect vulnerable communities from risks associated with market volatility, food insecurity and the loss of land tenure, and to ensure equitable outcomes.

Trust funds

The establishment of trust funds has been instrumental in the successful establishment of PES schemes. In Costa Rica, the national PES programme is based on the 1996 Forestry Law (Executive Decree No. 19886-MIRENEM). Article 46 of Forest Law No. 7575 established the National Forestry Financing Fund (FONAFIFO) for the purpose of financing forestry, reforestation, forestry nurseries, agroforestry systems, the recovery of deforested areas and the technological changes required for the use and industrialization of forest resources for the benefit of small and medium-sized producers through credit and other mechanisms that promote forest management (intervened or not). Another example is in Kenya, where public utility companies contribute to the Upper Tana–Nairobi Water Fund, an endowment fund that generates income, which, in turn, is invested in conservation work. Opportunities exist in sub-Saharan Africa to link established national funds (such as for climate change, forests and trees, and water) with PES schemes. The Nature Conservancy is part of an initiative in Peru that has created a financial mechanism called Aquafondo in a large-scale effort to protect and improve the availability and quality of water resources from the Rimac watershed through investments in watershed services. Aquafondo is a private funding mechanism – comprising the collection, management and disbursement of funds – that complements public-sector efforts in ecological and hydrological restoration and watershed conservation. Aquafondo aims to develop a cost-effective, incentive-based approach to working with upper-catchment communities in addressing land ownership, improving land-use practices, and achieving social equity related to the protection and provision of watershed services (Stern and Echavarria, 2013).



Photo 3: Water and air quality regulation are key ecosystem services provided by forest environments.

Land tenure

Clarity of tenure is an essential condition for effective PES schemes because it is the main means by which the right of land users to participate in such schemes as providers of environmental services is determined.

In most African countries, however, few land users – especially smallholders (who are the most likely local partners and providers of environmental services) – have documented tenurial rights. The lack of proof of land tenure diminishes the capacity of land users to participate in and benefit from PES schemes. It is important, therefore, to conduct socioeconomic assessments as part of the process of designing PES schemes to understand the tenurial arrangements in the proposed project area and to allocate benefits accordingly. A successful PES environment ensures that communities are protected from competitors, especially through the provision of long-term security of tenure, where applicable. An FAO publication, the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (FAO, 2012), sets out best practices in tenure governance and in managing access to and control over natural resources in a society. For example, it addresses the legal recognition of tenure rights of indigenous peoples and other communities with customary tenure systems, informal tenure rights, and the allocation of tenure rights to land, fisheries and forests owned or controlled by the public sector. These guidelines provide a useful reference when dealing with PES tenure-related issues.

In most successful examples of PES schemes in sub-Saharan Africa, the process has helped strengthen tenure. Strategies include the following:

- *Clarity of tenure:* some PES schemes have supported communities to acquire tenure rights, either as communal land associations or as individual households with access/use rights/permits to well-defined areas, perhaps within protected areas or on communal land. In the Wildlife Works project, for example, PES has supported cattle-farming community enterprises that previously did not have the know-how or financial resources to document their land tenure. In the Trees for Global Benefits initiative, PES has been used to safeguard the rights of communities through the formation of communal land associations, which are supported to acquire titles to community forests; moreover, the awareness-raising associated with the initiative has helped improve understanding of the need for secure tenure. In Madagascar, tenure rights are renewed as long as communities continue to fulfil their PES obligations.
- *Attribution of benefits and contributions based on a combination of use rights, tenurial rights and access rights:* anyone who can demonstrate long-term rights of access, use or tenure should be able to participate in a PES scheme. Such a demonstration may be in the form of, for example, purchase agreements; letters from local leadership or clan leaders as proof of inheritance; and confirmation of land allocations. One approach to avoid the exclusion of certain stakeholders is to share benefits communally in the form of community funds and investments in social services and common infrastructure.

PES markets

Creating rules for markets and trading

The existence of markets for environmental services is critical to the success of PES schemes, and these have been emerging in various countries worldwide. Formal markets – some voluntary, and others mandated by law – now exist, for example, for greenhouse-gas emission reductions (the “carbon” market); water; and biodiversity. The carbon market is generally considered a global market in the sense that the buyer of carbon emission reduction credits can be located anywhere, as can the seller. Payments for biodiversity protection mostly originate at the international level (e.g. from conservation non-governmental organizations – NGOs) but may also happen at the national or subnational level. Markets and transactions for watershed protection services are most likely to take place at the watershed or municipality scale because water-related benefits from land-use practices are typically obtained at those scales. The Bolivian example is a case of a localized PES scheme in which people living downstream who depend on water flowing from upstream contributes to a local conservation fund. There are cases, however, where payments for watershed management are part of international arrangements, such as the Lesotho Highlands Water scheme. In general, markets are created through national or international laws, which determine the rules that govern the market, such as by setting criteria for what is being sold, who will buy and who will be paid (and by what means).

In addition, focused PES deals are being forged with companies outside formal markets to facilitate investment in the restoration and maintenance of particular ecosystems and the environmental services they provide.

How PES transactions are structured

Most successful PES initiatives in sub-Saharan Africa involve market-based approaches that aim to reduce unsustainable resource use by rewarding sustainable use, thereby leading to the provision of environmental services and diversifying and increasing incomes for communities. Rather than excluding communities from access to resources, PES schemes aim to build capacity for sustainable forestry. PES schemes in the subregion have various shapes and forms, depending on the existing enabling environment; the categories are summarized in Box 4 and discussed in detail below.

BOX 4

Categories of payment schemes for forest environmental services in sub-Saharan Africa

- **Formal markets with open trading between buyers and sellers.** Formal markets for PES with open trading between buyers and sellers operate either under a regulatory cap or with the minimum level of the environmental services to be provided specified; or on a voluntary basis (e.g. carbon trading schemes).
- **Public payment schemes for private landowners.** Private landowners are rewarded for maintaining or enhancing environmental services (e.g. FONAFIFO in Costa Rica).
- **Public reward schemes for communal landowners/land managers:** communities are rewarded to maintain or enhance environmental services (e.g. CAMPFIRE in Zimbabwe and conservancies in Namibia).

- **Self-organized private deals.** Individual beneficiaries of environmental services contract providers of environmental services, either directly or through intermediaries (e.g. COMACO in Zambia).
- **Certification programmes.** Producers of various products (e.g. wood, paper, coffee and foodstuffs) who protect environmental services are rewarded (through the certification of their products) by greater market access and, potentially, higher prices.

Formal markets with open trading between buyers and sellers. Regulated markets for environmental services are established by laws that create demand for a particular environmental service by setting a “cap” on the damage to an environmental service. The users of the environmental service – or at least the people responsible for diminishing that service – respond either by complying directly or by trading with others able to meet the regulation at a lower cost. Buyers are defined by the relevant laws; they are usually private-sector entities or other institutions (e.g. state-owned utilities). Sellers may also be companies or other entities that the law allows to be sellers and who are providing environmental services beyond regulatory requirements. An example of this is the European Union Emissions Trading Scheme, in which large emitters of carbon dioxide (a greenhouse gas) in the European Union must limit annual carbon dioxide emissions to below specified levels.

Most examples of formal voluntary markets accessible to sub-Saharan actors are those for carbon. Trees for Global Benefit, for example, is a carbon emission reduction afforestation programme in Uganda in which smallholder farmers are required to undertake conservation management practices, mainly comprising the planting of indigenous tree species (e.g. *Measopsis eminii*, *Prunus africana*, *Warbugia ugandensis* and *Khaya* species), using the Plan Vivo Standard. Plan Vivo² comprises a set of guidelines, procedures and standards constituting a tried and tested system for generating carbon offsets while promoting sustainable land use and improving livelihoods. Trees for Global Benefit aggregates credits from multiple small-scale landholdings and links these farmers, through a cooperative offsetting scheme, to the voluntary carbon market.

Another project, the Wildlife Works Kasigau Corridor REDD+ scheme, protects over 500 000 acres (more than 202 000 hectares) of highly threatened forest in Kenya, securing a wildlife migration corridor between the Tsavo East and Tsavo West national parks and bringing the benefits of direct carbon financing to more than 100 000 people in the local communities. Wildlife Works uses REDD+ projects to protect threatened forests, wildlife and communities, helping landowners – whether governments, communities, ownership groups or individuals – in developing countries to monetize their forest and biodiversity assets.

Public payment schemes for private landowners. This type of PES scheme, which rewards private landowners for maintaining or enhancing environmental services, is in its infancy in Africa. Outside Africa, FONAFIFO’s scheme in Costa Rica is an example of a government-mediated PES scheme, in which landowners receive flat-rate payments for limiting their activities to specific land uses. South Africa is testing the feasibility of paying landowners and labourers to put their land into new forms of production geared towards the provision of environmental

² www.planvivo.org.

services. Although true market-based conservation programmes are not up and running in South Africa, a suite of public works programmes is laying the foundations on which such programmes might soon be built. For example, the Working for Woodlands programme is investigating potential income streams that could entice private and communal land users to undertake restoration work on their land. The aim is to remunerate land users for delivering services such as biodiversity conservation and the protection and maintenance of ecosystem functions (e.g. erosion control, the delivery of high-quality water, and – most talked about – carbon sequestration).

Another example of public payment schemes for private landowners is the “cash for assets” programme run jointly by the World Food Programme and the Government of Kenya, under which cash is paid to food-insecure households in seven arid and semi-arid counties in eastern and coastal Kenya if they work on projects to develop community assets that build resilience against drought. These projects involve rainwater harvesting for human and livestock use; soil and water conservation; the rehabilitation of degraded land; and the production of drought-tolerant crops. Workers are also paid for installing soil and water conservation technologies such as negarims and zai pits on their farms.³ The projects help develop skills and assets that increase food security and community resilience against drought.

Public reward schemes for communal landowners/land managers. Existing schemes in sub-Saharan Africa in which communities are rewarded for maintaining or enhancing environmental services are mostly in the form of communal conservancies involving the transfer of power from the central government to local communities for the management of wildlife areas. In these schemes, revenues (“payments”) are obtained mainly through ecotourism, and the buyers are mainly individuals (e.g. tourists and trophy hunters).

The key environmental services provided under conservancies are biodiversity conservation and the preservation of scenic beauty or other cultural services (e.g. as part of an ecotourism scheme). Arguably, biodiversity conservation is an overarching requirement for all environmental services because biodiversity is a prerequisite for healthy ecosystems. In the Namibian conservancies, payments are designed primarily to deliver biodiversity conservation and can therefore be described as a “biodiversity services” scheme. Wildlife conservancies promote biodiversity in numerous ways. By protecting animals of primary economic value, other animals and plants are also protected, and the majority of the land is retained in a natural state.

Another example of a public reward system for communal landowners is CAMPFIRE [Communal Areas Management Programme for Indigenous Resources]⁴, which was developed by the Government of Zimbabwe through its Ministry of Environment and Natural Resources Management. CAMPFIRE is a community-based natural resource management programme in which rural district councils, on behalf of communities on communal land, are granted authority to market access to wildlife in their district to safari operators. Those operators, in turn, sell hunting and photographic safaris to mostly foreign sport hunters and ecotourists.

³ Negarims and zai pits are simple water-harvesting structures that can improve crop production in arid and semi-arid areas.

⁴ <http://campfirezimbabwe.org>.

Other examples include revenue-sharing programmes in which there is a clear agreement on both sides of the deal that the community will be compensated for limiting activities in a way that increased the quantity or quality of the environmental services being bought and sold. In Latin America, community forest management organizations are compensated financially to protect or regenerate forest areas or establish plantations; those organizations distribute the received money among their members. Fundação Amazonas Sustentável, an NGO, runs a programme in Brazil, “Bolsa Florestal”, in which traditional river communities and indigenous peoples commit to conserving primary forests in exchange for financial compensation.

Certification. Certification programmes designed to reward producers who protect environmental services exist for a variety of products, including wood, paper, coffee and food. For example, the Forest Stewardship Council (FSC) – an international NGO consisting of representatives of the forest and timber industry, environmental groups, and indigenous peoples’ organizations – has established a labelling system for forest management practices with the stated aim of meeting “the social, ecological, and economic rights and needs of the present generation without compromising those of future generations”. The FSC (and other certification bodies with similar objectives) establishes standards for various aspects of timber extraction and forest management, and a third party assesses the operation’s compliance with those standards; companies that achieve certification are able to “ecolabel” their products to inform buyers of their environmental and social credentials. Companies achieving certification may benefit from improved access to markets or higher prices for their products; certification, therefore, may be considered a form of PES scheme because, by paying higher prices for certified wood, consumers effectively pay for the protection of certain environmental services.

Self-organized private arrangements. Private PES deals may arise where there is no formal regulatory market and minimal government involvement. In these circumstances, buyers of environmental services may be private companies or conservationists who pay landowners to change their management practices to improve the quality of certain environmental services. The motivations for engaging in such transactions are as diverse as the buyers. There are examples in sub-Saharan Africa where businesses have engaged with supply-chain partners to reduce environmental risk and thereby maintain and enhance the provision of environmental services. Buyers are motivated by the prospect of increasing the resilience and sustainability of their supply chains by building into them an evaluation of environmental risks and integrating payments for environmental services into products. Farmers receive premium prices – potentially 25–50 percent above the price of conventional produce – for their products in return for adopting sustainable production practices, and they also strengthen their adaptive capabilities. An example of a PES scheme involving forest conservation and supply-chain management is the Kibale Forest Wild Coffee Project, within which the Uganda Coffee Trade Federation (succeeded by the Kibale Forest Foundation) entered into a private arrangement with residents of six villages on the north-eastern border of Kibale National Park. These communities agreed to undertake conservation practices to mitigate threats to biodiversity in both the core conservation zone and the buffer zone. As an incentive, smallholder farmers receive a premium price for growing their coffee in small-holder agricultural systems certified as organic and “shade grown” – that is, coffee is grown in biologically diverse agro ecosystems that provide habitat for a richer diversity of fauna than large-scale coffee farms.

Public utilities (e.g. hydropower or municipal water) have also entered into private PES deals with local communities. For example, a hydropower company faced with the risk of lower production due to reduced water flow or siltation may engage with upstream landholders to invest in watershed management practices – such as tree-planting, grass bands and contour farming to reduce soil erosion – and to pay landholders to implement those practices. The benefit for the company is the provision of watershed services in the form of water flow regulation, water purification and increased storage and flood control. The Lesotho Highland water scheme and REAs in the Plurinational State of Bolivia are examples of this approach.

Although carbon markets are primarily created for climate services, they have given rise to additional systems that put a price on other environmental services as co-benefits. For example, The Climate, Community and Biodiversity Alliance (CCBA) is an initiative⁵ to promote the development of land management activities that simultaneously deliver significant benefits for climate, local communities and biodiversity. The CCBA, which was established in 2003, works to increase public and private investment in forest protection, restoration and agroforestry by developing standards that enable policymakers and project developers to demonstrate the delivery of social and environmental benefits from activities that reduce greenhouse-gas emissions.

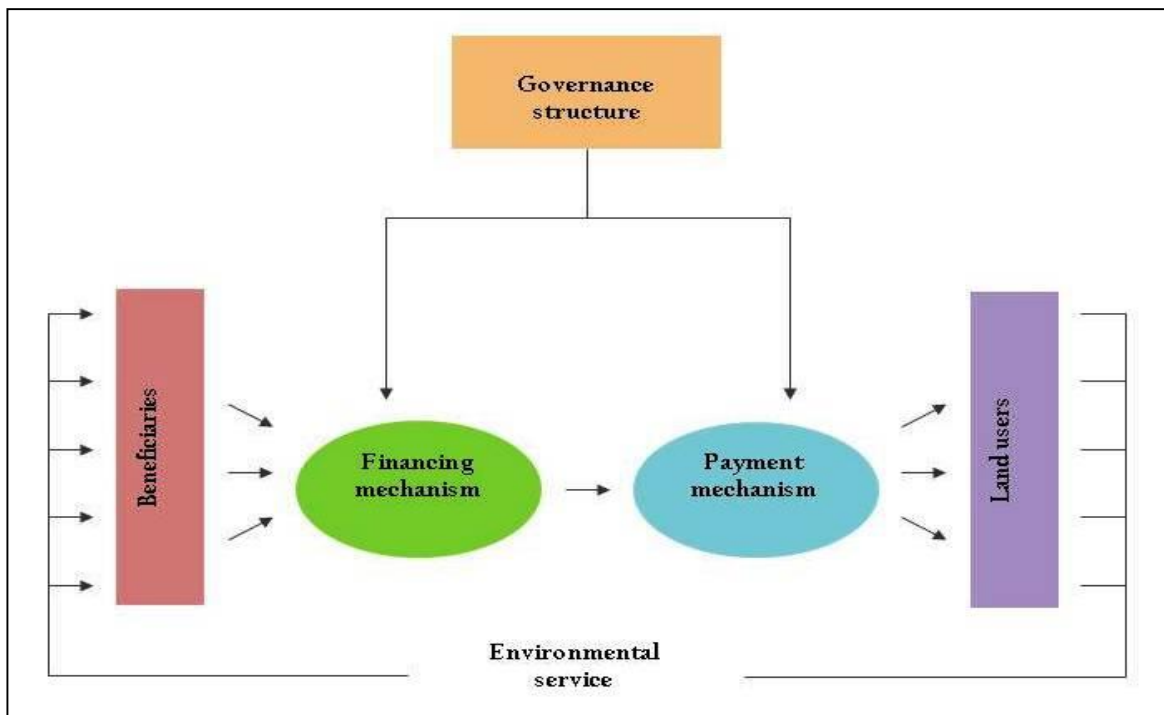
Some standards for climate services are inclusive, and the credits generated under those standards are considered to represent carbon credits with (biodiversity and livelihood) co-benefits. For example, project interventions under the Plan Vivo Standard include any improved land management activities that can generate quantifiable environmental-service benefits, improve the livelihoods of participants, and maintain or enhance biodiversity.

Supporting institutions and governance

A PES scheme can only be as effective as the institutional context within which it operates. For any such scheme, the governance system must be transparent and adaptable over time – that is, open to learning and improvement. Figure 2 presents a simplified institutional framework for PES. It depicts the key players as comprising: environmental-service providers (such as land users, land-rights owners and custodians – in the context of sub-Saharan Africa, these are local communities); the beneficiaries of those environmental services (who may include the international community, companies, and national and regional stakeholders); and contributors to the financing and payment mechanisms and the governance structures within which transactions are embedded.

⁵ The CCBA initiative is led by Conservation International, CARE, The Nature Conservancy, the Rainforest Alliance and the Wildlife Conservation Society.

FIGURE 2
An institutional framework for PES



Source: Adapted from Pagiola and Platais (2002)

Transparency and grievance redress

PES schemes in sub-Saharan Africa are likely to involve multiple partners with different needs, aspirations and expectations. It is important, therefore, to develop systems and procedures for transparency. This is especially true for schemes involving multiple stakeholders with varying interests and expectations. Schemes must develop processes that ensure equity, fairness, effectiveness and representation, minimize barriers to participation, and have clear guidelines for the redress of grievances.

Coordinator/intermediary

PES transactions require an intermediary institution that links the buyers of an environmental service(s) with the providers. Normally, potential buyers of environmental services are remote from land users, who may lack the technical capacity to quantify and value the environmental services they provide or to organize and negotiate effectively. The role of a coordinating or intermediary institution – which may be governmental, non-governmental, or from the private sector – in a PES scheme is critical, therefore, to the scheme’s success. Costa Rica’s PES scheme is managed by FONAFIFO, which is a fully decentralized body within the State Forest Administration. FONAFIFO’s general objective is to finance small and medium-sized producers, through loans or other mechanisms, to promote reforestation, the establishment of forest nurseries and agroforestry systems and the rehabilitation of deforested areas, and to benefit from technological advances in the use and industrialization of forest resources. FONAFIFO acts as an intermediary between buyers and suppliers of carbon credits. It handles applications, signs contracts, monitors implementation and disburses proceeds from a domestic fuel tax to

landowners. FONAFIFO also distributes funds to farmers from private hydroelectric companies, who are particularly concerned about sedimentation.

Most PES schemes in sub-Saharan Africa are coordinated by NGOs whose core missions are related to the objectives of PES, such as with regard to rural development and poverty alleviation, biodiversity conservation, or generating corporate revenues. In the case of Trees for Global Benefit, the project is managed by the Environmental Conservation Trust of Uganda (ECOTRUST), a local NGO, whose mission and objectives are linked closely to those of Trees for Global Benefits. The goal of ECOTRUST is to provide sustained funding for conservation in Uganda; Trees for Global Benefit is one of the avenues through which ECOTRUST achieves its goals.

Successful PES schemes – particularly those involving multiple buyers/funders and multiple land users – require strong intermediary institutions with clear organizational structures, an ability for sound, transparent recordkeeping, and long-term community support functions. The success of a scheme will depend primarily on the competence of the coordinating organization and its ability to form partnerships with organizations that enhance management capabilities.

Strategies for effective institutional frameworks

A number of actors in sub-Saharan Africa have employed strategies geared mainly towards efficiency. This section highlights the key strategies employed by projects in sub-Saharan Africa to establish effective institutional frameworks (and Box 5 summarizes these strategies).

Collaboration with other players. The coordinator of a PES scheme ideally has a longstanding and successful history with targeted communities and thereby has earned the trust of those communities. If such a history is lacking, however, PES schemes should seek collaboration and support from trusted organizations (such as NGOs and community institutions) and individuals (e.g. community representatives and extension workers). The success of PES schemes in the short to long term will depend on local institutional structures and their links to project and policy support. A study by the University of Leeds Center for Climate Change Economics and Policy (Butt, Dougill and Stringer, 2013) highlighted several benefits of working with and through local institutions. For example, existing extension services in departments of forestry, agriculture and related fields can be used to mobilize communities and monitor project activities (Dougill *et al.*, 2012). Cooperative societies can also be useful in reducing the cost of contracting individual landowners (Brown *et al.*, 2010), and they can act as primary communication links between cooperatives and government departments (Shames *et al.*, 2012).

Multilevel partnerships. PES schemes need to build connections between multilevel institutions and actors in achieving partnerships for shared and mutual goals. Such connections are easier to build when there is a strong existing relationship between the coordinating institution and established natural resource management committees and other local institutions.

Technical assistance. The capacity of proponent institutions to deliver varies between institutions and by context. The development of PES schemes requires expertise in many fields, which may not be present in a single institution. In most successful PES projects in sub-Saharan Africa, specialized expertise tends to be hired on short-term consultancies.



Photo 4: Coordination and holistic management of ecosystem services and its providing habitat is key in their sustainable use.

Structured communities

The effective participation of communities in PES schemes requires a willing (structured) community with a common understanding of issues related to the provision of environmental services and how this would relate to community needs and aspirations. To develop a shared vision, the community needs to undergo a process that addresses questions such as: What are current resource use practices and trends? How do these relate to the provision of environmental services and sustainable livelihoods? What is a suitable balance between meeting current needs and the continued provision of environmental services?

Ultimately, communities need to agree on what should be done differently to enable sustainable forest management and thereby ensure the continued (or increased) provision of environmental services.

Box 5

Key strategies for effective regulatory and institutional frameworks

- The governance systems should be transparent and adaptable over time – that is, open to learning and improvement.
- Projects should work with existing structures to avoid the duplication of roles and to reduce costs.
- Existing connections between multilevel institutions and actors can be useful and important in building trust and achieving partnerships for shared and mutual goals.
- Clarity of land tenure is critical to the PES process, and this can be a benefit of participating in a PES scheme.

Challenges

Methodological requirements

Standards and regulatory frameworks should promote PES as a tool for incentivizing, verifying and financing conservation action. The most advanced standards are those required for carbon markets. Many of the requirements in such standards are generalized and out of touch with reality in sub-Saharan Africa, and meeting them imposes a financial burden in such areas as project registration and monitoring that is often too costly. Existing standards have varying degrees of complexity. The Plan Vivo standard has been found to be most responsive to reality in sub-Saharan Africa because it was created specifically to support small-scale landholder participation in the voluntary carbon market. In addition to meeting the standards, there may be stiff government requirements and burdensome processes in setting up private or community schemes.

Markets

Although many countries in sub-Saharan Africa have policies to enable the development of PES schemes, this has not always resulted in the development of such schemes. Many countries lack the additional incentives for private-sector or public-utility companies to invest in environmental services. Thus, the decision of local buyers to reward land users for good land management might be made as part of their corporate social responsibility, not as a demand-driven compulsion to pay for the services enjoyed. The lack of development of payment schemes for watershed services in sub-Saharan Africa is not due to a lack of buyers – the activities of many private and public-sector beneficiaries are linked inextricably to the natural resource base and the environmental services ensuing from it. Often, though, potential buyers (e.g. hydroelectric power companies, municipal water suppliers, irrigation schemes, mountaineering and touring agencies, and mining and mineral processing industries) are too detached from resource-poor land users for meaningful engagement, or relevant government policies requiring or enabling them to engage do not exist. Governments can learn from the experience in Latin America, where government policies and programmes have enabled PES to become a major tool for mobilizing forest conservation resources. Government investment in pilot initiatives goes a long way in breaking down barriers.

Land tenure

A key factor limiting the participation of communities in sub-Saharan Africa in PES schemes is a lack of clarity on land/tree tenure and thus PES tenure. Entering into PES arrangements requires that the providers of environmental services (i.e. land-user communities) have clear and secure property rights and are organized (e.g. in cooperatives). The lack of clarity on tenure poses a major barrier to the attribution of environmental services to the rightful providers of those services and therefore to the efficacy of PES schemes.

In most of sub-Saharan Africa, the rural poor – who in most cases are the custodians and traditional owners of forests – lack formal land titles. Even where guidelines for the registration of forests exist, many owners are unable to afford the fees required to complete the paperwork. In some countries, PES processes have been used to deliver significant benefits in clarifying land tenure. In Costa Rica, the PES scheme has been instrumental in supporting private forest owners to register their forests, and some poorer landowners can now borrow against future payments to meet the costs of legalizing their tenure. The Costa Rican PES scheme provides support for

landowners from public authorities in evicting squatters. In Peru, the PES scheme recognizes that although land users may lack land rights, they generate environmental services and are therefore rewarded. For example, the scheme has directed compensation to people living illegally in a protected area, and the park management has developed a legal instrument (a conservation agreement) to regulate the relationship between these settlers and the park management office. In another example, Brazil nut farmers obtained a concession giving them the right to use the products derived from the land, but the use of environmental services was not considered in that arrangement. This changed with the approval of the new Forest and Wildlife Law, which gave land users the right to market environmental services (Brunner, 2015).

In Uganda, two approaches have been used in government-owned forest reserves. In Rwoho, for example, where the National Forest Authority manages the PES scheme, communities have the opportunity to buy shares in carbon credits. In other cases, where ECOTRUST (a private entity) operates the scheme, communities are given a tree-planting concession agreement, with tenure rights to the trees and carbon credits, and they are allowed to commercialize those credits (e.g. in a cooperative carbon offsetting scheme, as per Trees for Global Benefit).



Limited capacity

The successful implementation of PES schemes requires significant capacity, but few institutions in sub-Saharan Africa have people with the required expertise, and obtaining such expertise can be costly. Although decentralization processes in sub-Saharan Africa provide opportunities for landscape management at the local government level, there is limited capacity at this level to drive PES processes. Decentralization transfers or delegates the responsibility for forest management from the central government to local or regional administrations, without necessarily equipping these lower-level administrative units with the required resources and skills to exercise their new authority. In addition, there is generally a very low level of awareness and

understanding among local communities of this complex process. At a national or regional level, there is a need to build capacity for certification to improve access to international markets, including formal markets for environmental services, as well as for market for certified products.

PES is a new and evolving concept. Rather than waiting for capacity to develop, countries can use PES design and implementation processes as learning opportunities; that is, they should take a “learning by doing” approach.

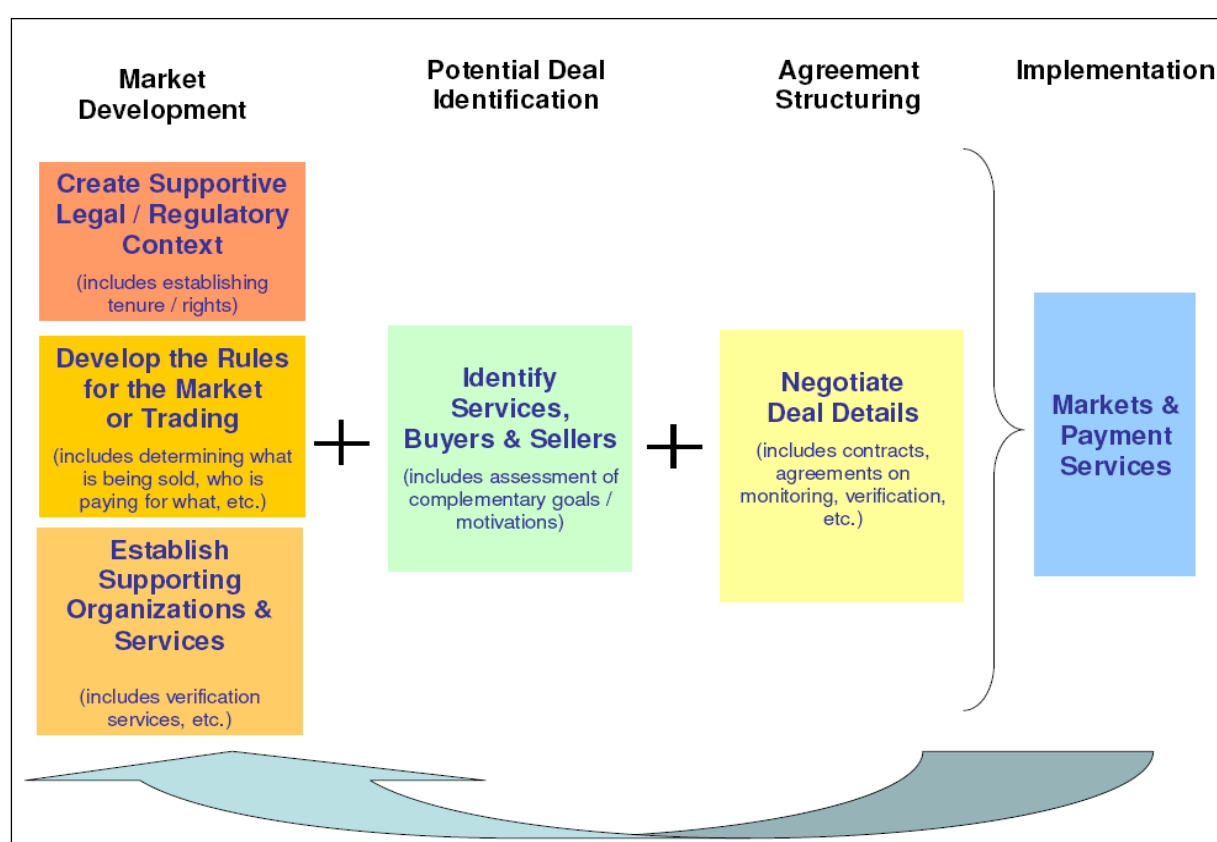
Limited understanding

There are many myths and misunderstandings about the application of PES schemes in sub-Saharan Africa. They provide an alternative to business as usual and, therefore, are bound to challenge certain norms. For example, the culture of paying for commonly available environmental services is new, and it can be misunderstood to mean the provision of hand-outs or “bribing” communities to participate in otherwise unpopular actions.

4 How to develop a PES scheme

This chapter enumerates seven steps in establishing a PES scheme. Step 1 focuses on what needs to be done by governments at the national level, and steps 2–7 set out what needs to be done to develop schemes within a national framework. Table 2 summarizes these steps (including by combining several steps in a more general step of “project development”), and Figure 3 depicts how the cycle interacts with the enabling conditions.

FIGURE 3
An overview of the PES cycle



Source: Adapted from Brand (2002)

TABLE 2
Summary of steps in developing a payment scheme for environmental services

Step	Key activities	Key outputs
Create an enabling environment	Create the regulatory framework Establish the rules of trading Establish supporting organizations	Policies and guidelines at the national level and institutions for their enforcement
Feasibility assessment	Conduct baseline biophysical and socioeconomic assessments	Feasibility assessment report
Project development	Consult stakeholders Prepare project document, including project objectives, description of activities, budget and institutional arrangement	Project idea note Project design document

	Estimate potential benefits accrued from project activities	Technical specifications of project activities
	Prepare monitoring plan	
	Prepare payment plan	
Project certification	Submit project documentation	Registration certificate*
	Validate project activities	Validation statement
Project implementation	Initiate project activities	
	- negotiate agreements with service providers	
	- build capacity for service providers	
	- facilitate implementation of forestry activities	
	Undertake internal monitoring	Monitoring report
	Make payments to service providers	
	Conduct third-party verification	Certificate issued

* Only required for projects or schemes based on specific market standards.

Step 1: Create an enabling environment

In developing a PES framework at the national level, it is important for the government to define the forest conservation path it intends to follow and to create institutions to assist in this. In Costa Rica, the PES scheme was driven by the ratification of international agreements and declarations on forestry and environment, as well as by the country's enactment of a law to promote the conservation and protection of natural resources, including by creating the necessary institutions and by a significant change in society's perceptions of the management, conservation and sustainable development of natural resources. The prevailing legal framework in Costa Rica also establishes the context for the application and recognition of environmental services and FONAFIFO's funding sources and governing mechanism, thereby providing for the scheme's institutional sustainability. Given the decentralized approach to forest management being pursued in much of sub-Saharan Africa, successful PES approaches there will require a strengthening of the capacity of local governments in forest management and conservation.

Step 2: Conduct a feasibility assessment

It is important to determine whether a proposed scheme will be viable before investing resources in it. A number of methodologies have been developed for assessing the feasibility of PES schemes (e.g. Fripp, 2014; Smith *et al.*, 2013). In her guidelines for feasibility assessments, Fripp (2014) suggested the consideration of three components of successful PES schemes: 1) demand; 2) supply; and 3) appropriate transaction infrastructure (i.e. marketplace).

Kelsey, Kousky and Sims (2008) looked at how the environmental, socioeconomic, political and dynamic context of a PES policy is likely to interact with policy design to produce policy outcomes, including environmental effectiveness, cost-effectiveness, and poverty alleviation. To be environmentally effective, they considered that a project must deliver a set level of environmental benefits; to be cost-effective, a policy must achieve the same level of environmental benefits at a lower cost than other possible policies. From a social perspective, the costs of a PES scheme include the direct costs of implementation as well as the transaction costs of the programme and the cost of forgone alternative productive uses of the resource (i.e. the opportunity cost). In all cases, a robust scientific baseline and supporting information are basic requirements.

Generally, the proponents of PES schemes should understand that feasibility requires positive environmental and economical outcomes, as well as sociocultural acceptance. Even if a willing buyer is available, it is not automatic that the environmental-service providers will accept the terms.

It is also important to recognize that feasibility assessment projections are made under business-as-usual conditions, which would change should the project come into existence. This, and the often high degree of confidentiality around costs, makes it difficult to accurately estimate the costs associated with PES schemes, and they are often underestimated. Feasibility assessments will provide a broader view of feasibility if they consider values other than economic payments, such as social benefits and payments. Moreover, feasibility should be considered at the landscape scale, taking into account as many angles and objectives as possible.

Sometimes the willingness of buyers to pay for forest environmental services may be low, but other avenues for raising funds to support PES may exist. Feasibility assessments should provide information on the cost of delivering multiple environmental services, which can be used to mobilize support for co-investment from the beneficiaries of one or more of a bundle of environmental services.

There may be little difference in the cost of a feasibility assessment, whether it is for one or several environmental services. It is sensible, therefore, to undertake assessments that are forward-looking and inclusive of all potentially marketable environmental services. The viability of a PES scheme may lie in a suite of environmental services, either “stacked” (in which various environmental services are sold in separate transactions in a single scheme) or “bundled” (where the sale of one environmental service also provides co-benefits).

Initial estimates should be conservative; schemes that are only marginally viable under initial assumptions are unlikely to survive further scrutiny. In addition to developing scenarios for generating carbon credits and revenue, it is crucial to develop a clear understanding of land-use trends in the project region, particularly for REDD+ projects. Given that a scheme’s success will rest on achieving a positive change in baseline trends, a sound picture of drivers and agents of land-use change must be developed (see “REDD+ guidance” below), and the feasibility of interventions to tackle these drivers and agents needs to be assessed. This will include an assessment of the capacity and experience of scheme participants to effect change.

Some schemes that would struggle with transaction costs and methodological requirements under the Voluntary Carbon Standard (VCS) or Clean Development Mechanism (CDM) may need to explore other options. For example, a project with agroforestry activities on 500 hectares of smallholder land is unlikely to ever recover transaction costs under the VCS or CDM, but it may be viable under standards such as Plan Vivo. Schemes may also choose to enter into direct private deals with potential buyers of environmental services to avoid the transaction costs associated with standards. When choosing alternative standards, however, proponents should be aware that the market segment of potential buyers and funders will shift and, most likely, shrink significantly. Table 3 summarizes the areas that need particular attention, and Table 4 indicates some common mistakes in conducting feasibility assessments.

TABLE 3
Key considerations in feasibility assessments

Component	Key questions	Approach
Financial cost–benefit analysis	<ul style="list-style-type: none"> • What is the expected return on investment? • Are there other returns that may not be valued in terms of money but which could play a significant role in keeping the scheme running? • How will the project ensure that these values are captured and recognized by stakeholders, especially in building a business case? 	Cash-flow analysis
Project boundary	<ul style="list-style-type: none"> • What scale would be required for the project to make a meaningful contribution to the delivery of the objectives, and to break even? • What approach should be used to look at scales and boundaries? • What would be the key entry points? 	Geographic information systems could be a useful tool for a first geographical assessment <i>ex-ante</i>
Sociocultural acceptance	<ul style="list-style-type: none"> • Does the targeted community have the prerequisites for participation (e.g. land tenure, capacity to undertake project activities)? • What is the relationship with the forest, and how is this likely to be affected by the proposed PES scheme? (e.g. What are the opportunity costs?) • How is the proposed PES scheme likely to manage the expectations to enable the matching of supply with demand? • Does the community have experience in performance-based rewards (e.g. in contract farming)? • How much reward is sufficient to incentivize action? 	Socioeconomic baseline assessment
Supporting institutions	<ul style="list-style-type: none"> • Is there a potential coordinating entity, and what is its capacity? • What is the capacity in other supporting institutions? (e.g. financial institutions, conflict resolution, extension service provision) 	Institutional analysis
Environmental-service provision	<ul style="list-style-type: none"> • What makes the targeted general ecosystems critical for conservation? • What are the environmental management objectives to be addressed by the PES scheme? • What are the environmental services (e.g. watershed, carbon, biodiversity) and products relevant to PES? • What are the key entry points? 	Biophysical assessments
Willingness to pay	<ul style="list-style-type: none"> • Who are the potential buyers, and what is their ability to pay? • What is the value proposition for potential buyers? 	Stakeholder analysis and consultation
Legal regulatory environment	<ul style="list-style-type: none"> • Are the national forest management and conservation institutions supportive of PES and/or providing a case for PES as a policy instrument? • What are the compliance requirements for national and international regulations? • If legal or regulatory changes are required, are they feasible within the timeframe of the scheme? • What is the situation with land use and land tenure? 	Desk review
Potential approaches	<ul style="list-style-type: none"> • Do relevant initiatives (PES or otherwise) already exist? • What lessons do they provide? 	

TABLE 4
Summary of mistakes to avoid in undertaking PES feasibility assessments

Issue	Description	Considerations
Initial overestimation of project scale	Projects tend to undergo a process of shrinkage from initial conception to final validation and execution. It is also common that project areas need to be reduced as key stakeholders are consulted, land measurements and surveys are completed, and non-eligible land areas are excluded	Understand that estimates of environmental services are likely to be scaled down as baseline estimates are revised, carbon stock measurements become more reliable, and discounts are applied for leakage and risk buffers
Underestimating project costs	<p>Project development and implementation are both frequently far more lengthy and costly than project proponents initially assume. Getting a project to the point of validation can be more expensive than initially foreseen</p> <p>Underestimating the costs of establishing and managing forest plantations or the costs of addressing the drivers of deforestation and developing alternative land-use practices – interventions that may involve thousands of actors</p>	<p>Take a step-by-step approach to analysing the costs. Considering the project as part of a broader conservation and livelihood improvement project will help in devising ways of offsetting costs</p> <p>Same as above</p>
Optimistic assumptions about PES finance	<p>Overestimations in terms of project size and PES benefits translate into the risk of overestimating potential revenues</p> <p>Focusing on the higher end of prices that may exist in different markets and assuming that the project will fall into a niche with exceptional prices</p> <p>Projects typically face a finance gap, with significant costs in the start-up phase. Frequently, projects face further delays in generating revenue if the development, validation and verification processes take longer than projected</p>	<p>Base projections on conservation estimates</p> <p>Take into account the preferences and likely demand for the offered environmental services</p> <p>Consider PES together with other revenue streams (e.g. the sale of timber or other products or non-market finance)</p>

Step 3: Consult stakeholders

Stakeholder involvement should be based on mutual respect and recognition of the roles and interests of all stakeholders. When many parties are involved (which is usually the case in land-use projects), PES schemes should build in measures – such as feedback mechanisms to continually respond to the needs and aspirations of stakeholders – to ensure transparency throughout design and implementation. Most forest-related standards require that project developers demonstrate the free, prior and informed consent (FPIC) of individuals or groups of individuals – stakeholders – likely or be affected by a project. In addition to it being a requirement, stakeholder consultation and involvement can improve scheme design and implementation and are likely to help build confidence in, and a common vision for, the scheme and to increase the commitment and participation of stakeholders in its implementation.

King (2007) studied the lack of success in several types of wildlife and habitat sustainability programmes and found that the two biggest failings were a poor understanding of the affected communities and a lack of community involvement, which ultimately meant that local stakeholders largely ignored the programmes.

To ensure effective stakeholder involvement, PES schemes must identify, through a consultative process, the interests, roles and incentives required for stakeholder participation. Such

consultations increase understanding of the scheme's benefits, risks and costs and enable community members to decide whether to participate in the scheme or to opt out. For schemes affecting community ownership, occupation or use rights, key elements of effective engagement and FPIC include:

- *identifying customary land areas and tenure systems*: involving community members in data-gathering, using indigenous names and land-use classifications, identifying important religious, cultural or economic sites, identifying all users and rights-holders, and working with neighbouring groups to define and agree boundaries;
- *engaging with representative organizations*: involving customary institutions recognized by the state and accepted by people, such as local government and *ad-hoc* institutions established by communities to deal with outsiders;
- *providing information* about potential impacts, costs and benefits, risks, conflicts, opportunities, obligations and duration as well as legal implications, communicating in local languages and ensuring widespread participation;
- *ensuring that consent is freely given*: avoiding any form of coercion, allowing legal representation, and allowing all interest groups and representatives to participate;
- *ensuring consent is prior*: for community-based projects, planning projects together with communities through iterative processes, with the “no-project” option presented as a real option, rather than presenting projects as “done deals” at the end;
- *ensuring there is consent*: allowing time for institutions to consult with and obtain feedback from the wider community, ensuring effective communication of potential implications of proposed intervention, the output being a written agreement; and
- *addressing gender issues*: recognizing that men and women typically have different roles and interests in natural resource management and can contribute complementary skills and knowledge, as well as having different levels of power, influence and control – all of which need to be taken into account to avoid perpetuating or accentuating gender inequity.

Step 4: Develop the project idea

In developing a project idea, project developers and supporters need to define from the outset what the project's objectives are, what the activities will be to achieve those objectives, and where the project will take place. Scheme developers also need to identify participants and partners critical for implementing activities and reaching objectives. This needs to be done before embarking on a complex design process focusing on measuring and monetizing PES benefits.

Step 4.1: Define project objectives

It is important to understand throughout feasibility assessments and project design that PES schemes usually go beyond the provision of environmental services. They are usually integrated conservation or rural development projects (or commercial enterprises) with components not

necessarily integral to the PES scheme but which are nevertheless important to the overall enterprise (e.g. improved forest management or timber processing). PES is just one avenue for generating income and providing incentives to ensure the economic viability of landholders while contributing to the sustainable provision of environmental services. It is important, therefore, to *clearly state the objectives*, differentiating between those that relate to the provision of environmental services and those that do not. Box 6 summarizes the categories of PES objectives.

Box 6

Categories of objectives for payment schemes for environmental services

- **Provision of environmental services:** e.g. increasing carbon stocks or reducing carbon stock losses; biodiversity conservation or enhancement; and watershed services (e.g. reducing siltation from runoff, regulating water flow).
- **The creation of economic returns,** whether for local resource holders, private investors, or both, must be a key objective because it is essential for ensuring the viability and sustainability of the scheme. Economic returns need not rely exclusively on the sale of environmental services. Some restoration and conservation projects may focus on environmental services as the primary or even sole source of revenue, but creating more than one revenue stream (e.g. the sustainable production of timber) may increase the resilience and attractiveness of a scheme.
- **The creation of social benefits:** there are various ways of ensuring that benefits derived from PES schemes go beyond the direct participants. The distribution and delivery of social benefits are important aspects of scheme design.

Step 4.2: Define the activities

The definition of activities derives from the scheme's objectives and is linked to approaches for technical design and validation. In general, PES objectives are best achieved through a *landscape approach*; definitions of landscape-scale PES activities include the following:

- *Ecosystem restoration:* the process of assisting or allowing the recovery of a degraded ecosystem by re-establishing the structure, productivity and species diversity originally present in the area (e.g. restoring a degraded forest by planting or seeding, or through assisted natural regeneration, to recreate the natural ecosystem and species composition).
- *Ecosystem rehabilitation:* the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed by restoring ecosystem processes, productivity and services, but without re-establishing the pre-existing species composition and structure (e.g. interplanting naturalized tree species on degraded agricultural land to restore soil functions).
- *Prevention of ecosystem conversion:* preventing the conversion of an ecosystem to another use (e.g. preventing conversion of a forest ecosystem to farmland through REDD+ activities). Activities might include improved management to reduce threats, assisted natural regeneration, and the provision of alternatives through the domestication of some of the forestry resources.
- *Prevention of ecosystem degradation:* preventing the gradual or persistent process of loss of capacity of an ecosystem to provide environmental services (e.g. preventing the degradation of grasslands by changing grazing practices or management activities).

-
- *Improved land management*: improving land use and management to increase the provision of environmental services (e.g. wildlife conservation on private lands through the establishment of wildlife conservancies).

Different standards have different requirements for PES activities. At a minimum, scheme proponents will likely need to do the following:

- Assess available areas for reforestation, with an eye to favourable geographic and ecological characteristics; relatively secure land tenure; and the eligibility criteria of the target standards. How many hectares could the project realistically cover, where are the lands located, and who has jurisdiction over them?
- Determine the overall management and silvicultural approaches, including species' mixes, planting arrangements and possible harvesting regimes.

Step 4.3: Define the key participants

Most PES schemes will involve multiple participants, including groups involved in implementing PES activities (e.g. farmers engaged in improved agricultural practices, or NGOs introducing new techniques and coordinating training efforts) and land and forest owners, and various institutions and other organizations. It is important to determine the leaders and partners in each aspect of scheme development (e.g. design, coordination and the implementation of strategies and activities) so that partners implement those aspects of the scheme that best suit their core capacities. Communities are best approached through their traditional authorities for meetings to discuss PES concepts and goals and to address issues related to customary and formal tenure.

Step 4.4: Determine scale, area and boundaries

Scheme proponents should clearly identify the scale and location that will be subject to interventions. Existing PES schemes indicate that a range of spatial scales is feasible, from small (e.g. reforestation efforts on several hundred hectares) to national (covering hundreds of thousands of hectares or more). The boundaries of most schemes designed to facilitate payments for biodiversity conservation and watershed services are defined by the landscape (for example, the Upper Tana–Nairobi Water Fund is centred on the upper catchment of the Tana River). Costa Rica's PES scheme operates nationally, although some private companies have made small-scale private arrangements – for example, Rios Tropicales, a tourism company, makes payments to providers of sustainability initiatives. The parallel implementation of large-scale and small-scale schemes encourages complementary experiences and the cross-fertilization of knowledge.

Various standards and methodologies provide guidelines for defining project boundaries. The voluntary market and carefully crafted partnerships may provide niches for even tiny projects, although the transaction costs may be prohibitive for very small schemes (for example, validation, monitoring, verification and market engagement typically cost hundreds of thousands of dollars per scheme), and PES schemes are best applied at least at the landscape or catchment scale. The size barrier can be overcome if small areas combine to create larger schemes, for example by aggregating private lands across a landscape to form conservancies. Most successful PES schemes, especially those that are community-based, have been initiated as pilots, with project boundaries modified over the course of scheme development through landowner

outreach and land acquisition to achieve landscape-wide coverage. It is advisable, therefore, to make project definitions outward-looking, with preliminary and conservative estimates of the impacts of pilots but with provisions for expanding boundaries and size as schemes develop.

Step 4.5: Relevant laws and regulations

Schemes should identify and document relevant local, national and international laws and regulations that have an impact on design and management and identify means of ensuring that the design takes into account the need to comply with such laws and regulations.

Step 5: Determine the means of valuation and the attribution of environmental services

In successful PES schemes, the environmental service(s) involved are clearly defined and visible (understandable), and the service providers and users are properly identified and informed. The charges and payments are not set arbitrarily but after systematic consultation and evaluation. Standards provide methodologies for calculating and documenting the benefits created by scheme activities (with respect to the environmental services provided) and for the certification of those benefits. Good practices (and indeed standards) dictate that PES schemes have a process for demonstrating that they generate real and additional benefits in the provision of environmental services using credible quantification and monitoring systems based on sound science. Usually, the methodologies include the design and use of technical specifications to estimate environmental services, including descriptions of the following:

- applicability conditions (i.e. under what baseline conditions the technical specifications may be used);
- the activities and required inputs;
- the benefits to be generated in the provision of environmental services and how those will be quantified;
- how the scheme is to be monitored;
- how the scheme plans to attribute the provision of environmental services to the various stakeholders; and
- how outcomes will be linked to payments.

Even if a scheme is not targeting formal markets and therefore has no intention of registering with a standard, it is still recommended that proponents use best practices from an existing standard to value environmental services.

BOX 7

Examples of contents of a monitoring plan

- Performance indicators and targets to be used and how they demonstrate if environmental services are being delivered.
- Monitoring approaches (methods).
- Frequency of monitoring.
- Duration of monitoring.
- How the validity of assumptions used in technical specifications is to be tested.
- The resources and capacity required.
- How communities will participate in monitoring (e.g. by training community members and gradually delegating monitoring activities over the duration of the scheme).
- How the results of monitoring will be shared and discussed with participants.

Source: Based on the 2013 Plan Vivo Standard

Step 6: Develop a monitoring and verification plan

In any effective PES scheme, the targeted environmental services must be accounted for over a specified quantification period that is of sufficient length to provide a clear picture of the long-term impact of the activity. Schemes are required to employ an approved approach to quantify the environmental services generated by each intervention compared with the baseline scenario.

Step 6.1: Planning monitoring

Consultation. The planning stage involves consultation with stakeholders to provide an understanding of the frameworks, formulae and methodologies that already exist and are available at the national or local level with the aim of adapting them to the PES scheme. The plan should also link to existing plans, such as national adaptation plans. Stakeholder involvement and integration with existing plans are both essential for the sustainability of PES schemes. The consultative process should keep all relevant stakeholders informed about monitoring and evaluation strategies and help build capacity among those stakeholders.

Tools and methodologies. The tools and methodologies should describe the approaches to be taken for monitoring performance, compliance and impact. These should be robust in ensuring that comprehensive information is gathered while also being user-friendly. Methodologies should use appropriate technologies (e.g. mobile applications, aerial imaging, documenting through photography, and combining participatory activities with technological approaches, for example in mapping), and monitoring intensity should be set so as to avoid monitoring fatigue in communities and to minimize costs.

Targets and indicators. The monitoring plan should define mutually agreed targets/aims for evaluation, the duration of monitoring, and the indicators to be used. Indicators should be SMART – that is, specific, measurable, achievable, realistic and timely – and they should integrate multiple environmental services and link to benefits. They should be adaptable over time and space and relevant across communities. Developing such indicators requires consultation with all relevant stakeholders.

Linking with risk management. Monitoring is part of risk management. Therefore, the monitoring plan should include in its objectives the generation of information that can be used to detect risk and thus contribute to its avoidance, mitigation or minimization. Projects must

identify and describe where uncertainty exists in quantifying environmental services and estimate the degree of uncertainty – which must be used in setting the conservativeness of the accounting method for quantifying environmental services. Box 7 presents an example of a monitoring plan.

Step 6.2: Staffing for monitoring

PES monitoring requires committed staff with a mix of skillsets, led by a person with a wealth of experience as well as broad knowledge and skills. The retention of staff with the skills and knowledge relevant to monitoring requires good management. It will be necessary to develop easy-to-understand training tools that help staff internalize the monitoring exercise. Partnerships with universities can help in developing suitable staff and in providing opportunities for students to participate in monitoring, which could help reduce costs. It is also useful to combine monitoring with other activities such as security, community capacity building, and the provision of extension services.

Step 6.3 Implementing a monitoring plan

Participatory monitoring – the involvement of local communities, households and other local stakeholders – is recommended as a way of collecting large quantities of simple data on forest resources (Box 8 sets out some principles for participatory monitoring). Mobilizing communities can be a cost-effective way of conducting ground-based surveys compared with the use of professional surveyors. It is also a meaningful way of raising awareness in communities about the environmental values of forests in the context of climate change and how they can improve forest management. Collaborative work promotes a culture of cooperation among forest owners, managers and users and the officers of involved local, subnational and national governments. Because monitoring is an additional activity for communities on top of their regular forest practices and other non-forest livelihood activities, time-effectiveness is an important factor affecting a community's willingness to participate.

6.4: Quality control

Any monitoring system (PES or otherwise) is as good as the quality of the information entered into the system and the way in which that information is managed. There is a need, therefore, for quality control, which should emphasize the following:

- correct information, including data collection accuracy and ensuring complete datasets;
- appropriate facilitation to ensure that monitoring is regular and accurate;
- proper analysis of data to support the evaluation of desired outcomes;
- flexibility, so that indicators can be added where required; and
- a system for checking the robustness of monitoring results (e.g. the project coordinator checks random samples of data).

Step 6.5: Reporting monitoring results

There must be a clear process by which the results of monitoring are shared with stakeholders. Reporting should include the results of monitoring and recommendations for decisions that may need to be made as a result of the monitoring. Different tools may be required for reporting to different stakeholders at the local, subnational, national and international levels. In dealing with

communities, it may be most effective to use existing traditional routes of communication (e.g. through chiefs or other local leaders).

BOX 8

Principles of participatory monitoring

- **Participation:** participatory monitoring is based on the principles of participation in forest management.
- **Simple methods and tools:** participatory monitoring methodologies must be simple enough for communities to implement, with training and assistance from technical forestry institutions.
- **Cost- and time-effectiveness:** simple procedures may achieve the best results for the lowest cost in the least amount of time.
- **Reliability of data:** data collection methods should use best practices.

Step 7: Negotiate and implement PES agreements

Rewarding land managers and groups for the provision of environmental services requires an agreement – a “service agreement” or a “PES agreement” – between the entity making payments for the services (commonly through an intermediary, such as the scheme’s coordinator) and the individual or group undertaking activities to provide the services.

A PES agreement is a contract between a PES scheme coordinator and a smallholder or community group specifying the rights and responsibilities of the parties for a given duration. Inevitably, the process of developing PES agreements varies from one context to another. Many have involved memoranda of understanding or memoranda of agreement between conservation agencies or their intermediaries on one side and the environmental-service providers on the other, with the latter engaged as individual farming households, community groups or institutions. Some schemes, such as the Cederberg Conservancy in South Africa, provide more than one option for participation. Under the Capenature Stewardship programme, of which the Cederberg Conservancy is part, landowners can enter into:

- “contract nature reserves”, which are legally recognized contracts or servitudes on private land to protect biodiversity in the long term;
- “biodiversity agreements”, which are negotiated legal agreements between the conservation agency and landowners for conserving biodiversity in the medium term; or
- conservation area agreements, which are flexible options with no defined period of commitment.

The Cederberg Conservancy has signed ten contract nature reserves, one biodiversity agreement and one conservation area agreement. Combined, these have contributed about 170 000 hectares to conservation and the expansion of the Greater Cederberg Biodiversity Corridor. Table 5 provides a summary of project–buyer relationships in sub-Saharan Africa, and Box 9 presents the key elements of PES agreements.

TABLE 5
Summary of PES community–project–buyer relationships in sub-Saharan Africa

Type of agreement	Description	Examples
Conservation easement agreements	Private landowners, who range from private individuals to family units, enter into legally binding conservation easement agreements with schemes that describe the roles, responsibilities and benefits. Conservation easement agreements may also be made between a community and government for the management of large communal areas that are close to national parks, have low human population density, and are set aside as concession areas leased for professional hunting activities. Conservation easement agreements enable the effective participation of rural communities and the generation of income for these communities through the sale of environmental services (e.g. hunting and photographic safaris, and biodiversity offsets)	CAMPFIRE; Namibian conservancies; Wildlife Works; Cerderberg conservancy
Cooperative carbon offsetting Scheme	The scheme operates as a platform through which a coordinating agency or cooperative obtains emission reduction credits from multiple landholder farmers and trades these through purchase agreements with PES buyers looking to offset their environmental footprints. Aggregation allows the scheme to achieve a marketable scale	ECOTRUST/Trees for Global Benefit
Linking conservation to value chains	Conservation is linked to value chains through “insetting”, in which businesses engage with their supply-chain partners to identify and invest in opportunities within their supply chain to reduce ecosystem risk and conserve and enhance the flow of environmental services. Through insetting, supply chains are made more resilient and sustainable by building in the evaluation of ecosystem-related risks and integrating payments for environmental services into products	Trees for Global Benefit working with coffee companies to invest in activities that reduce the risk of lower coffee production due to climate change and water scarcity
Brand endorsement	Brand endorsement approaches are usually private deals involving business partnerships between private-sector entities and producers living in areas important for biodiversity to encourage the adoption of conservation-friendly farming practices and participation in sustainable forest management activities	The WILD brand under COMACO, a special brand of organic, value-added processed products sourced from farmers living with wildlife; Wildlife Works’ employment-generating venture with Puma based on the production of fair-trade, carbon-neutral merchandise

Best practices require that contractual arrangements are consensual, flexible and aligned with existing institutions and norms. Compliance is monitored regularly, and governance is transparent and adaptable over time (that is, open to learning and improvement).

Box 9
Key elements of a PES agreement

- **Terms and type of payment:** when, how much, how often, to whom, and other details, such as cash to one person, a community group, the vendor of a community service (e.g. builders of a school), and whether the payment will be in cash or in kind (e.g. technical assistance or materials for a community building).
- **Timing of payments:** for example, if payments will be made when the seller carries out activities aimed at providing environmental services, when monitoring confirms that the activities have occurred, or a combination of these two.
- **Requirements that need to be met for payment:** such as periodic monitoring, reporting and verification needs.
- **Managing risks:** particularly those risks beyond a seller's control (such as unexpected natural events). Agreements should have clauses detailing how specific risks are to be shared between sellers and buyers and (if available, cost-effective and feasible) the payment of insurance.
- **Signatories to the contract:** should be directly affiliated with the buyer (or group of buyers) and the seller. Provisions setting out specific roles for support institutions, and details of the payments to be made to intermediaries for services rendered, may be useful.

Source: Forest Trends, The Katoomba Group and UNEP (2008)

5 How to implement transactions in payment schemes for environmental services

This chapter presents some of the strategies that have been applied in sub-Saharan Africa to mobilize resources for PES scheme development, market engagement and benefit-sharing.

Role of government

The public nature of environmental services requires the strong involvement of national and local governments. They are key players in the successful implementation of PES schemes in sub-Saharan Africa: for example, governments tend to regulate and control hydroelectric power generation and water production, with the private sector participating only in distribution. Currently, however, governments in sub-Saharan Africa have been involved in PES schemes to only a limited extent, with most schemes driven by NGOs or the private sector.

There is potential for governments to create local demand for environmental services and to mobilize additional resources to support PES schemes, for example under “sustainable forest management” in the sixth replenishment of the Global Environment Facility or through national implementing entities under the Adaptation Fund. The establishment of tax incentives for PES by national governments could help guarantee the availability of funds for PES transactions. The Government of Costa Rica, for example, generated US\$5 million for that country’s PES scheme through tax incentives, and international donors complemented these funds. On the other hand, Burundi’s Institute of Tax Incomes found that the Burundi Government was making no payments for environmental services, even though the Office of Environment was created to channel tax funds for such payments.

Governments also need to invest in pilot schemes to demonstrate their viability, to make industries aware of the risk involved with business as usual, and to increase the willingness of such industries to pay for the continued provision of environmental services.

How to mobilize funds

The long-term objective of sharing the lessons learned from working examples in this document is to assist actors in sub-Saharan Africa to augment the financial resources available for sustainable forest management by generating greater recognition and appreciation of the benefits of trees, forests and forestry and increasing the willingness to pay for these benefits. Defining the most advantageous financing arrangements and finding the right partners can be challenging. The localities where PES schemes are implemented on the ground are usually a long way from the centres of finance and offset demand. In addition, the various types of sales and investment arrangements all have advantages and disadvantages that may become more or less applicable as schemes advance or the priorities of stakeholders change. Not least, the array of players can be hard to evaluate, with new companies and players emerging seemingly on a daily basis, some of them reputable, competent and honest, and others less so.

It is important to understand that there are several possible sources of finance or revenue, ranging from domestic funds, internally generated revenue through the sale of environmental

services and products, community contributions, the private sector (which should go beyond corporate social responsibility obligations), national utility companies, and international funds (such as the Adaptation Fund, the Green Climate Fund and the Least Developed Countries Fund). This section presents strategies that have been used to mobilize funds, by type, and assesses their appropriateness in certain contexts.



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Photo 6: The development of a PES scheme requires several steps and conditions to obtain a more complete understanding of its roles.

Development funds

The process of developing a PES scheme can be protracted and costly in terms of time, finance and human resources. It must compete with other investment options that may seem more attractive because they have the ability to produce immediate gains. Most working examples of PES schemes have used donor funding to offset development costs, although there are also cases where buyers or potential buyers have provided start-up funds. Strategies applied in obtaining donor or private-sector support to develop PES schemes include the following.

Donor support. Donors increasingly prefer to support initiatives that trigger the generation of funds for conservation, and PES schemes may be considered as part of sustainability plans for donor investments. Donors also want means for measuring and verifying their contributions to environmental conservation. Some projects that have succeeded in accessing donor funds have done so on the strength of using a PES scheme as a monitoring tool.

PES buyer support. There are instances where the potential buyers of environmental services

invest in the development of the scheme. This is usually in exchange for rights to the first option to purchase exclusive rights or for a given quantity of environmental services. Some standards, such as Plan Vivo, issue *ex-ante* certificates to provide scheme developers with an opportunity to mobilize project development resources; these certificates are issued *ex-ante* when activities have been implemented but the carbon services will be delivered in the future (e.g. they may be issued for tree-planting activities, which will result in carbon sequestration as the trees grow). The Plan Vivo standard requires that, when certification is *ex-ante*, the project coordinator or the organization(s) with shared responsibility are responsible for long-term monitoring to ensure that the environmental-service benefits are delivered. Table 6 gives examples of how projects have been able to mobilize support for project development.

Co-investment. A number of opportunities exist for partnerships with private companies that could support the delivery of environmental services. For example, funds may be mobilized from stakeholders (especially through multistakeholder platforms) interested in improving landscape management, such as companies for which the sustainability of their supply chains depends on the landscape and which therefore want to maintain the supply of environmental services. This type of sponsor would be attracted to join a scheme as co-investors, which may require new information (which could be generated through comparative studies, valuations or other assessments) to demonstrate the role of PES in improving landscape management.

TABLE 6
Examples of sources of funding for project development

Source of funding	Example of project funded
Donor support for national budget	The establishment of conservancies in Namibia was made possible with funding from various donors, including the United States Agency of International Development (USAID) through its Living in a Finite Environment (“LIFE”) project, the Endangered Wildlife Trust, WWF and the Canadian Ambassador’s Fund
Biocarbon Fund	The Rwoho Project was developed with funding from the World Bank’s Biocarbon Fund to the Government of Uganda (represented by the National Forestry Authority – NFA). The NFA works with the Rwoho Environment Conservation and Protection Association to increase carbon stocks, and the NFA offers the carbon credits produced by the scheme to the Biocarbon Fund as per the framework of the emission reductions purchase agreement. The NFA pays participating community groups for each tonne of carbon dioxide sequestered, on delivery, at a price stipulated in the agreement
Private sector	Wildlife Works received significant start-up funding from BNP Paribas in the form of an option pledge to buy verified emission reduction credits over a five-year period. The market-based conservation solution is based mainly on job creation, sustained by consumer demand for carbon offset credits and other wildlife-branded merchandise (e.g. organic fashion apparel). The people employed in wildlife management are paid by the income earned from the sale of carbon credits and in enterprises run by the scheme

Project implementation funds

Investment in a scheme may be secured at any point in the development process; to some extent, therefore, its placement in this “step-by-step” framework is arbitrary. In principle, agreements for finance or sales may be made even at the earliest stage of scheme development. Agreements may be made with different buyers or investors at different stages of the process.

Ideally, the cost of implementing a PES scheme should be met from the sale of environmental services. However, the income from the sale of one type of environmental service may be insufficient to incentivize sustainable forest management. Studies have shown that the recent

commodity boom increased competition for land and its opportunity costs and PES did not provide sufficient incentives (Hou, 2013). This section presents examples of strategies that have been employed to mobilize resources that enable PES schemes to (at least) break even by generating income and minimizing transaction costs.

Income generation. The key strategy for income generation lies in the innovation of the scheme developer in designing multiple income streams. Strategies include bundling, stacking and diversifying project income streams, mainly through donor support, the sale of forest products, and ecotourism. A mix of funding sources is likely to be required to generate sufficient revenue to sustain schemes. In Costa Rica, FONAFIFO's funding includes government sources (from fossil fuels and forest tax revenues); loan and grant agreements with bilateral and multilateral donors; water protection agreements with private businesses; and individually purchased environmental services certificates. In the case of the Upper Tana–Nairobi Water Fund, funds from utility companies contribute to a long-term endowment fund, which is invested in conservation work and used to underwrite the PES scheme.

Reducing transaction costs. Several strategies have been applied to reduce the transaction costs of PES schemes and to increase the efficiency of such schemes. These include:

- partnerships with other stakeholders;
- hiring (local) expertise using short-term technical assistance funds; and
- designing schemes as part of wider conservation and livelihood improvement programmes.

Engaging the market

Making contact with buyers

The effective demand for environmental services (especially carbon sequestration and biodiversity conservation) usually derives from global buyers (mainly in Europe and the United States of America), although beneficiaries of such services also include local communities. Key strategies include the following.

- All buyers of environmental services engage with sellers through an intermediary, such as in Costa Rica's national scheme, where buyers and sellers engage through FONAFIFO using water protection agreements or individually purchased environmental services certificates.
- Sellers engage with buyers, either directly or through intermediary institutions, through brokers or resellers (e.g. Uganda's Trees for Global Benefit).
- Sellers or their intermediary institutions draw from their networks to devise strategies for linking the sellers of environmental service with prospective buyers.
- Crowd funding – for example, Wildlife Works has used crowd sourcing for VCS- and CCBA-credited projects to sell 20 000 carbon credits using a music video from a famous musician and other components of their marketing strategy.

Establishing a market share

This section discusses the characteristics that have enabled actors in sub-Saharan Africa to establish market share.

Value proposition. Value proposition is a key factor in helping environmental-service providers stand out from the crowd. Understanding what motivates buyers is important for designing strategies to demonstrate the value to potential buyers of investment in a given scheme. The degree of competition in both supply and demand is key. Buyers seek the lowest-cost suppliers of services, although there is growing interest in – and a premium placed on – the co-benefits of PES deals, such as habitat conservation and poverty alleviation. In addition to affordability, a growing number of buyers are looking for deals with proven benefits for surrounding communities or which have been endorsed by credible NGOs, thereby reducing the reputational risk associated with participating in a scheme. In such cases, cost is important but may be secondary to the “quality” of the product or even the “story” associated with the scheme. Examples of buyer motivation include the following.

- *Conservation leadership:* there is increasing demand in the private sector and the donor community to demonstrate conservation leadership by supporting PES schemes. According to the State of Voluntary Carbon Markets report (Hamrick and Goldstein, 2015), 22 percent of offsets purchased for voluntary end use were done so to “demonstrate climate leadership” in the buyers’ respective industries. Traditional corporate social responsibility was behind another 40 percent of voluntary offset transactions. Multinational corporations were responsible for over one-quarter of all offset demand in 2012, offsetting 27 million tonnes. Trees for Global Benefits, for example, sells more than 90 percent of its emission reduction units to corporations, mainly in Europe (e.g. Tetra Pak, Max Hamburger) but also in Africa (e.g. Nedbank).
- *Payments for bundled environmental services:* in bundling, multiple services are quantified and monitored, or the quantification of one service (e.g. carbon sequestration) is used as a proxy for other environmental services, and beneficiaries pay for the delivery of this “bundle” of services. Bundling is useful for several reasons, but mainly because the additional services add value to the primary service and thus attract a premium price without adding greatly to the transaction costs. The 2012 Ecosystem Marketplace report (Peters-Stanley and Hamilton, 2012) indicated that demand had surged for carbon offsets from forestry projects certified to the VCS and the Climate, Community and Biodiversity (CCB) standard. The CCB is an “add-on” standard used to verify that a climate services scheme also delivers community and biodiversity benefits. Plan Vivo only issues bundled certificates – schemes can use the Plan Vivo standard to access the voluntary carbon market and markets for non-carbon environmental services such as watershed or biodiversity services, by selling Plan Vivo certificates. In the Kasigau Corridor project, for example, Wildlife Works bundles carbon emission reductions with biodiversity conservation, and it has been certified by the VCS and the CCBA. The project, therefore, can sell carbon credits as evidence of biodiversity conservation and climate regulation. The project has created several revenue streams, including the sale of carbon credits and the sale of wildlife-branded organic merchandise, by which enterprises are paid.
- *Supply-chain security:* the potential to mitigate supply-chain risks is one of the motivations for agricultural commodity buyers to invest in forest environmental services through carbon offsets or agricultural niche markets. In the case of Portal Plantations and the Experiential Learning Center, for example, the security of supply chains for high-value essential oils, spices and flowers is highly dependent on forestry; other supply chains that may rely on

forest environmental services include coffee and cocoa. Investment in forest environmental services is likely to be attractive to corporations as a way of securing their supply chains, demonstrating corporate social responsibility and capitalizing on niche markets for their products.

- *Risks of continuing with business as usual:* Generating empirical evidence on the risks of business as usual is a key strategy for translating an ability to pay into a willingness to pay. The Wildlife Conservation Society in Rwanda, and The Nature Conservancy in Nairobi, Kenya, have both conducted research to predict the likely increase in the cost of treating water if no investment is made in watershed management. In Rwanda, the Wildlife Conservation Society is undertaking a comparative study of tea companies, some of which use water derived from a watershed comprising a protected forest and the others using water from degraded landscapes. The results of the comparative study will be used to build a business case for the tea companies to invest in watershed management.
- *Sustainable development:* donors are likely to be attracted to PES schemes as a means for delivering sustainable development. Peters-Stanley and Hamilton (2012) observed that sustainable development projects continue to grow in popularity because of their multiple community benefits, and PES leaders are considering how the international donor community can harness such approaches to deliver benefits at a much larger scale. In Uganda, for example, ECOTRUST mobilizes donor funding (from the United States Agency for International Development and the United Nations Development Programme) through projects that apply the Trees for Global Benefit model as a form of ecosystem-based adaptation.

Achieving scale Most PES schemes, especially in sub-Saharan Africa, start as pilot schemes. An effective approach may be to begin with a limited set of small-scale landholder farmers, with a long-term plan to expand and diversify through mechanisms to introduce new communities and activities over time. Trees for Global Benefit, for example, is designed as a cooperative offsetting scheme in which credits from multiple landholdings are aggregated to achieve scale. The scheme started with a pilot of 33 farmers in one district and has now expanded to ten districts, recruiting up to 600 farming households annually. New communities and activities are introduced into the scheme through the development of technical specifications.

Determining market value

The price of an environmental service is determined ultimately by what the buyer is willing to pay and what the seller is willing to accept and deliver. In regulated markets, the price is often mandated; in voluntary PES markets, it is negotiated. For most environmental services, markets have not yet developed to a level that allows the establishment of a market-determined price. Several strategies have been employed to determine the value of environmental services. For carbon credits, the market is demand-driven and prices are set accordingly. Nevertheless, these prices are confidential and it is difficult, therefore, to know the average market price.

It is important for PES schemes to establish a base price during feasibility assessments based on the transaction costs and what service providers are willing to accept (which normally is determined by an appraisal of those providers). The price that providers are willing to accept is usually related to the opportunity costs involved; the scheme would therefore set a base price

derived from a combination of the willingness to accept and the transaction costs, and price negotiations would aim to ensure that, at a minimum, providers can break even. Another strategy would be to estimate the “willingness to pay”, which can be estimated based on the value that buyers are likely to attach to a given service (for example, as a factor of the cost of alternatives). In the Upper Tana–Nairobi Water Fund, the plan is to attach a price to the cost of pollution. Preliminary studies indicate that the Nairobi City Water and Sewerage Company spends approximately 10 million Kenya shillings (about US\$130,000) per year on water purification and desilting clogged intakes; if it is possible to estimate the extent to which improved catchment management can reduce these costs, the value of the service can also be estimated.

Box 10 summarizes the main potential approaches for establishing a price for environmental services.

Box 10 **Main approaches for establishing a price for environmental services**

- **Economic value**, or the quantification of economic benefits of the services from a societal point of view (both direct and indirect).
- **Financial value**, which is a combination of:
 - the actual private financial benefits to specific actors, which can be estimated based on the costs of replacing an environmental service if it were damaged or unavailable
 - the cost to a landowner of making the necessary resource management changes (e.g. planting trees)
 - the cost of the transaction, including creating baseline documentation of the status of the environmental service(s) and developing a plan for changing practices to improve the flow of environmental services over time
 - the opportunity cost to landowners based on alternative land-use options.
- **Relative cost of alternatives** such as building a water treatment plant versus investing in environmental service-based filtration.
- **Market or transaction price**, which is partly a reflection of perceived risk and uncertainty as well as of bargaining power and the existence or otherwise of co-benefits.
- **Pricing of similar deals.**

Rewarding service providers

A PES scheme is not complete until the payments or rewards for generating the environmental services are delivered to providers. This section examines the kinds of reward and how they can be delivered effectively.

Definition of rewards

Rewards in PES schemes may be in the form of cash or non-cash benefits. The latter can potentially far outweigh the cash benefits and may include technology transfer (e.g. improved irrigation technology in the Upper Tana–Nairobi Water Fund), capacity building and increased land-tenure security. It may also include increased land productivity (e.g. when nitrogen-fixing or shelter-providing trees are introduced to agricultural systems) or other benefits arising from improvements in environmental services. Often, however, PES scheme participants may be unaware of such benefits. PES scheme proponents should invest in raising awareness about benefits because this could help sustain positive land management activities if and when cash payments cease.

Another potential non-cash benefit of PES schemes is an increase in employment. The main local benefit of the Wildlife Works REDD+ conservation strategy, for example, is job creation; the aim is to provide viable livelihood alternatives for people who had previously destroyed their environment to survive. Wildlife Works REDD+ projects have created the following jobs: conservation rangers, factory workers, horticulturalists, machinists, seamstresses, foresters, carpenters, construction workers, drivers, mechanics and administrative personnel. The company also finances small businesses: for example, it has a joint venture with Puma to produce a carbon-neutral T-shirt line in an eco-clothing factory based in Kenya's Rukinga conservancy.

It is important to recognize that income from PES schemes is generally low, and it may be insufficient to provide the necessary incentives to sustain the provision of environmental services. There is a need, therefore, to obtain benefits for providers from diverse sources and mechanisms (e.g. income from related enterprises and donor funding). There is also a need to consider carefully the provision of additional benefits to participants actively involved in implementing the scheme or who are traditionally marginalized (e.g. women, the landless, and people living in remote areas). Such considerations point to the need for schemes to develop clear guidelines or bylaws to guide PES benefit-sharing. In implementing such guidelines, flexible, adaptive and dynamic approaches should be adopted to ensure they are well suited to the particular context.

How to ensure that payments result into action

A defining factor in a PES scheme transaction is that it results in the provision of a benefit (in the form of improved environmental services) that would otherwise not have occurred. Schemes may use either “output-based” or ‘input-based’ payment models to ensure this.

Output-based payments are made on the delivery of actual environmental services. For example, payments might be made for a certain level of water purification, the sequestration of an amount of carbon, or a measured increase in biodiversity. In an ideal world, output-based payments would form the basis of all PES schemes.

Input-based payments are made when specified land or resource management practices are implemented on the assumption that such practices will ultimately lead to an improvement in environmental services. For example, input-based payments might be made for the creation and maintenance of vegetation buffer strips along watercourses or for the restoration and upkeep of green spaces in residential areas. Costa Rica's PES scheme applies this approach to reforestation, forest protection measures, natural regeneration and agroforestry systems. Specifically, the scheme pays the following: reforestation activities – US\$816–980 per hectare per year for ten years; forest protection – US\$64 per hectare per year for five years (with an option for extension); natural regeneration – US\$41 per hectare per year; and agroforestry: US\$1.30 per tree for three years.

Table 7 describes various payment types and gives examples. Most schemes use multiple approaches to benefit-sharing.

TABLE 7
Examples of payment types

Payment type	Description	Example of project
Direct cash payments		
Individual performance-based payments	An output-based model that estimates the environmental benefits generated by individuals or groups of households tagged to the attainment of individual performance targets	Trees for Global Benefit; FONAFIFO; Cash for Assets
Payments based on shareholding	Communities are mobilized through associations, under which participating households buy shares. PES payments are allocated according to these shares	Rwoho
Conservation dividends	If participating farmers fully embrace conservation guidelines (e.g. resulting in reductions in poaching or illegal charcoal-making) they receive an end-of-year “conservation dividend”	COMACO
Revenue-sharing	Local communities enter into partnerships with, for example, the managers of protected areas, to undertake certain tasks. In return, they receive a percentage of (for example) tourism revenue	Canopy Walk at Kakum; Kibale Association for Rural and Environmental Development
Community grants through trust funds	Income from a PES scheme is used to establish an endowment fund that provides grants to assist local community groups in developing socioeconomic activities with positive environmental impacts and which provide alternative livelihood options	Reciprocal environmental agreements in the Plurinational State of Bolivia; Mgahinga Bwindi Forest Conservation Trust
Non-cash rewards		
Right to access forest resources	Communities are given rights to access specified forest resources in exchange for responsibilities aimed at reducing forest degradation and deforestation. Communities may or may not develop enterprises based on the resources they are able to access	
Right to sell environmental services	Communities are granted the authority to sell access to wildlife (e.g. photograph safaris, controlled hunting and expeditions). This might be in community wildlife reserves or on private land under a forest stewardship programme	CAMPFIRE in Zimbabwe and wildlife-based PES schemes in Botswana
Employment by project	The scheme invests in sustainable forest-related businesses that generate employment in local communities	
Financing investment opportunities	The scheme finances small businesses that lead to sustainable forest management and also benefit communities. This is usually achieved through the establishment of a revolving fund	Most schemes
Access to markets and premium prices	Farmers participate in conservation initiatives through improved management of their land and participation in sustainable forest management. Producers are rewarded with higher commodity prices for improved land management and farming practices that can sustain higher food crop yields while reducing potential conflicts with natural resources	Kibale Wild Coffee; COMACO

Inclusive participation

Inclusive participation of targeted communities is one of the most challenging issues for PES schemes in sub-Saharan Africa and also a critical factor in their success. Most forests are in remote areas, surrounded by communities that typically are not served by regular extension agencies or other programmes and are otherwise neglected. Considerable effort is needed to

build the necessary social capital and trust among communities to ensure the sustainability of interventions. This, in turn, involves considerable costs not normally covered by PES schemes alone; additional resources may need to be mobilized. On the other hand, community-led and -driven approaches that enable communities to identify their own priorities and address their own concerns are likely to produce better results.

Cost-sharing

PES schemes should consider not only the benefits they might generate but also the costs, which should be shared equitably. For example, the cost of improving the management of a watershed that straddles an international border may be born mainly by the upstream country, while the downstream country enjoys the benefits. The concept of PES is that the beneficiaries of environmental services compensate those who bear the costs of providing those services.

Challenges

Institutional capacity

The effectiveness of any PES scheme is as good as the institutional context in which it operates. PES is still in its infancy in sub-Saharan Africa, and few institutions have the capacity to participate effectively in the design and implementation of PES schemes. Moreover, most providers of environmental services are not well organized for engaging in such schemes. More government investment in institutions to support PES scheme processes would help build much-needed local capacity to engage in PES. In so doing, governments need to create space for the participation of multiple stakeholders. For example, NGOs can be instrumental in mobilizing communities to create the structures they need to participate in PES schemes.

Costs

A central challenge for PES schemes is obtaining access to start-up capital for scheme design and investment in sustainable forest management to generate and ultimately sell environmental services. Transaction costs, such as those associated with contract negotiations, scientific baseline studies, and monitoring and enforcement, also need to be factored in (Kelsey, Kousky and Sims, 2008). The design process can be costly, especially if it is tapping into a regulated market, which might involve costs for registering and validating schemes. Some organizations seek buyers willing to provide upfront financing, while others ask communities to commit their own resources; most schemes, however, continue to rely on government/donor grants to fund activities. For organizations focused on building project portfolios, fundraising is an ever-increasing burden, diverting significant resources from work on the ground. It is important to recognize that generating income from the sale of environmental services will usually be insufficient to offset the cost of establishing and managing forests, addressing the drivers of deforestation, and developing alternative land-use practices – interventions that may require the involvement of thousands of actors. In most cases, multiple revenue streams will be required, such as:

- the sale of single or bundled environmental services;
- the sale of multiple environmental services (e.g. stacking carbon with biodiversity and watershed services);
- the sale of products (such as timber and food) and services (such as ecotourism); and

- non-market finance (e.g. donor support).

Building trust

Building trust among stakeholders takes time and resources that most (especially donor-supported) schemes cannot afford. Mistrust is often the default position, especially between scheme developers and environmental-service providers, with the latter viewing PES schemes as just another way of depriving them of their livelihoods. For example, certain direct causes of deforestation, such as charcoal-making, slash-and-burn agriculture and timber harvesting, are important sources of livelihood for communities. Communities may depend on forests for water, energy, food and building materials, and PES schemes set out to regulate (or, in some cases, prohibit) access to these resources. It is important for stakeholders to understand that a PES scheme will not threaten – and, rather, may actually enhance – their rights to land or their capacity to use forest resources sustainably. Stakeholders should also be aware of, understand and trust the safeguards to be put in place to protect their tenure and human rights and their right to participate. Entry-point interventions can play an important role in building such trust.

Benefit-sharing

Inequality in benefit-sharing is one of the main sources of conflict in the implementation of PES schemes. For example, a lack of clarity on land tenure, coupled with other inequalities, can skew access to PES scheme benefits to only privileged members of a community, while the most vulnerable groups – such as youth, women and indigenous peoples – are prevented from participating in PES scheme negotiation and benefit-sharing processes. Equitable benefit-sharing requires an understanding of the roles played by different stakeholders and how these serve forest stewardship and therefore the provision of environmental services. In the case of women, gender-mainstreaming approaches should be used from the design stage through to implementation. PES scheme processes should identify opportunities to involve different stakeholders in the feasibility assessment stage and create design mechanisms to provide space for the participation of all stakeholders. This may be as simple as understanding the ways in which stakeholders use their time, and planning consultative meetings accordingly to ensure they are able to participate. In the Trees for Global Benefit scheme, for example, meetings are held close to households, with the timing coinciding with when women have fewer household chores to enable their participation. Trees for Global Benefit has also supported the negotiation of access rights in protected areas and used these as a basis for benefit-sharing.

Forest stakeholders may need to change their practices to obtain income or other benefits from a PES scheme, but the cost of making such changes may pose a considerable obstacle, especially in schemes designed to make *ex-post* performance-based payments. There may be a need, therefore, to develop mechanisms for the provision of upfront resources and incentives. Some schemes, such as Plan Vivo, allow *ex-ante* crediting as a source of upfront funds. Other markets allow “front loading”, an arrangement in which credits can be purchased in advance – buyers provide resources for carbon asset creation in exchange for a right of first refusal to sign an emissions reduction purchase agreement forward contract when the project reaches validation. For example, the World Bank’s Carbon Fund initially targeted certified emission reductions through the CDM in least-developed countries.

Translating ability to pay into willingness to pay

Even when there is a demonstrated ability to pay, it is not automatic that this will translate into willingness to pay. In most cases, the potential buyer is a private company, which is motivated by an ability to make a profit. Although there may be strong links between the sustainable flow of environmental services and profitability, these links are not always appreciated. To bring companies on board a PES scheme requires strong engagement, potentially including the use of pilot schemes to demonstrate the benefits and the processes by which such benefits can be obtained. For example, pilot schemes can help utility bodies (e.g. hydroelectricity companies or municipal water users) understand that the cost of sedimentation can be reduced significantly by incentivizing improved forest management. Companies that would benefit from improved environmental services may be far removed from the communities that could provide those services, and linking the two constituencies so that payments lead to improved services is challenging.

PES schemes should avoid the perception that they could deprive certain constituencies of their rights. For example, raising the cost of water to pay watershed managers to improve their management practices could be viewed as reducing the access of less-affluent people to water. Steps should be taken, therefore, to ensure that the introduction of a PES scheme does not have unintended consequences for social equity.

Governments should also ensure that PES policies do not cause undue harm to the private sector, and incentives such as tax breaks could be used to encourage direct investment in PES schemes. The key aim is to harness the self-interest and corporate social responsibility programmes of the private sector by demonstrating the advantages of PES schemes for the bottom line and public image.



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Photo 7: Lack of governance and institutional capacity are some of the large challenges that are faced when developing PES programmes

6 How to manage risk

What is risk?

Any PES scheme is likely to face multiple risks that could undermine its performance. These may include a failure to:

- achieve the desired environmental benefits;
- mobilize sufficient resources to sustain the flow of environmental benefits; or
- achieve desired socioeconomic impacts.

PES schemes attempt to place a market value on relatively abstract environmental services; an additional risk is that this approach contrasts with the cultural conceptions and economic models operating in traditional communities.

These and other risks can complicate the implementation of PES schemes and potentially render them unviable. Risks will be exacerbated where there is a lack of transparency or where resource access or ownership is disputed. A scheme may prove unable to deliver the expected environmental services or desired socioeconomic results, jeopardizing the scheme. Another risk is that the scheme delivers the expected environmental services but fails to find a market for those services.

The early identification of risk is a crucial aspect of scheme development, and those risks need to be reflected in the design of the scheme and of specific risk-mitigation strategies. An evaluation of risk is highly recommended for any proposed scheme.

In assessing risks, scheme developers should recognize and take into account factors outside the control of the environmental-service providers (e.g. wildfire, insect infestation or changes in rainfall) that could affect the provision of environmental services and the viability of the scheme. The risk assessment should identify all potential risks, determine their potential impacts on the scheme, and identify remedies.

Several approaches are available for risk assessment. The VCS requires scheme proponents to conduct risk assessments using the systematic AFOLU [“agriculture, forestry and other land uses”] Non-Permanence Risk Tool. An independent auditor must, in turn, evaluate such assessments.

Potential risks of payments for forest environmental services

Risks can be categorized as follows: *internal risks* (e.g. project management capacity or financial viability); *natural risks* (e.g. the occurrence of fires and pests); and *external risks* (e.g. land-tenure conflict). External and internal risks stem mainly from an inadequate understanding of what is being bought and sold and the long-term implications for local livelihoods and resource rights. It is important to identify and consider these potential issues and to identify potential “friction” points before exploring a PES scheme. Table 8 summarizes the risks associated with PES schemes and provides examples of how they might be controlled.

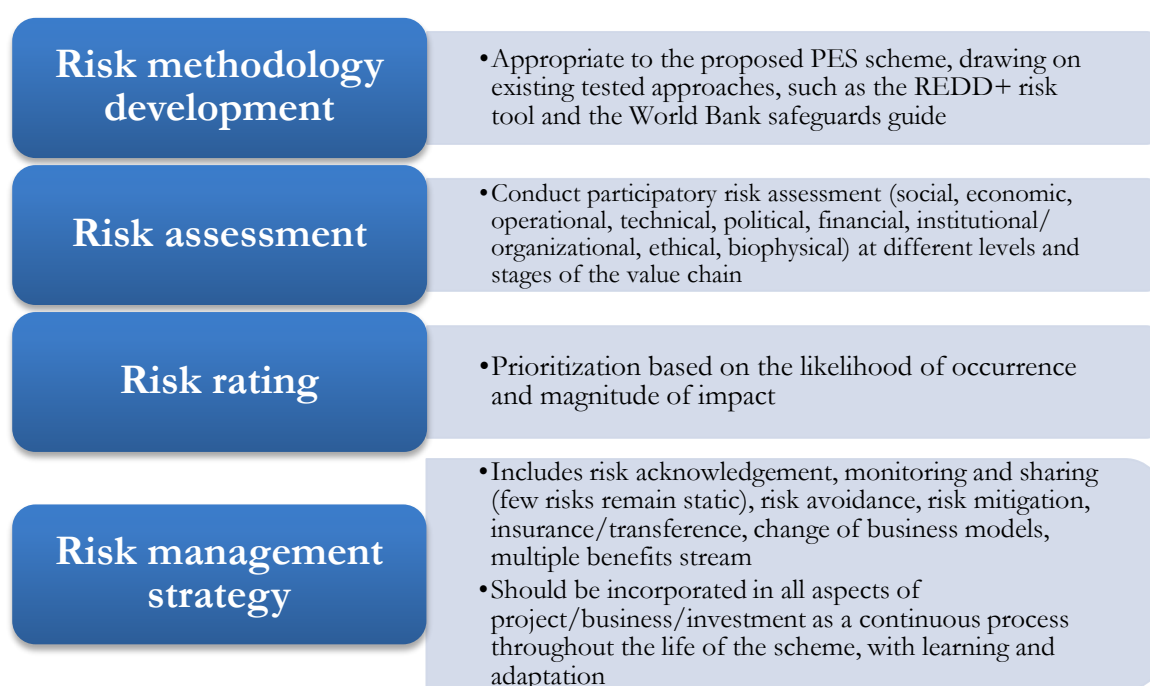
TABLE 8
Potential risks of PES schemes and how they might be controlled

Potential risk	Description	Control
Socioeconomic risks		
Loss of rights to harvest products or use environmental services	Loss of rights to critical, non-negotiable activities	<ul style="list-style-type: none"> • A resource plan that accounts for sellers' access to forest resources as part of the agreement • Consultations with all resource users on the land in question
Opportunity cost	Reduced land production, which may lead to loss of employment as well as to reduced support from donors and aid agencies	<ul style="list-style-type: none"> • Weigh the possible loss of non-PES opportunities against revenues from a PES deal
Increased competition and/or loss of land rights	The success of a PES scheme could attract speculative investors, which could in turn squeeze out indigenous landowners, especially where tenure is insecure	<ul style="list-style-type: none"> • Ensure that increased tenure security is a benefit of the PES scheme
Unfair outcomes	Net revenues are shared unevenly between communities and business entities, mainly due to asymmetrical information	<ul style="list-style-type: none"> • Proper consultation • Rules to guide benefit-sharing
Loss of control and flexibility over local development options and directions	Poorly designed easements or long-term contracts can limit land management activities to a narrow range, which could cost community residents their right to exercise certain options for managing their lands	<ul style="list-style-type: none"> • Scrutinize limitations carefully in light of potential future options that sellers of environmental services wish to keep open
Environmental service-related risks		
Loss of critically important environmental services	Poorly designed carbon schemes may lead to large-scale monoculture plantations, which may negatively affect watersheds and biodiversity. Payments for watershed services may create incentives to divert water away from local agriculture	<ul style="list-style-type: none"> • Take entire ecosystem into account
Risk to permanency	Factors outside the control of the environmental-service providers, such as wildfire, pests and changes in rainfall, may result in a failure to achieve contractual obligations and, consequently, in non-payment	<ul style="list-style-type: none"> • Employ insurance strategy, such as formal insurance or risk buffer, where the plan is to deliver more than the minimum required under the contract
Confusion over resource and environmental-service rights	Payments for biodiversity offsets or water-related services may be misunderstood to imply accompanying control over biological or genetic or water resources	<ul style="list-style-type: none"> • Ensure that agreements are clear on these distinctions
Financial risks		
Market-related risks	<ul style="list-style-type: none"> • Failure to mobilize sufficient buyers • Disowning market agreements • Market saturation – failure to sell • Shrinkage of demand • Price fluctuation, price-fixing 	<ul style="list-style-type: none"> • Long-term buyer commitments, with fixed volumes • Clear value preposition
Financial viability	<ul style="list-style-type: none"> • Failure to raise sufficient funds, leading to a failure to break even • Unstable cash flow, leading to a lack of interest from producers • Price insufficient to incentivize behavioural change 	<ul style="list-style-type: none"> • Proper financial analysis feeding into the pricing model • Diverse income streams • Multiple rewards
Limited supply	<ul style="list-style-type: none"> • Failure to match supply with demand • Poor planning • Side marketing/double counting 	<ul style="list-style-type: none"> • Purchasing credits from producers in advance of finding buyers • Regular monitoring and communication

Managing risks

Risk management begins at the design stage by assessing potential risks and establishing the risk context, which includes developing a common understanding of the proposed scheme among all stakeholders. When the risks have been identified, they are rated based on the likelihood of their occurrence and the magnitude of likely impacts. These two assessments are used to guide the prioritization of risks as well as the development of strategies to address those risks. Risk management is a continuous process that should be linked to the monitoring and evaluation framework to ensure a continuous flow of information as a guide to decision-making. Figure 4 summarizes the steps in PES scheme risk management.

FIGURE 4
Steps for developing a risk management strategy in PES



Managing the risk to permanency

Scheme proponents can reduce risk by demonstrating that threats have been identified and that effective risk-mitigation strategies, monitoring systems and response measures are in place. A lack of information on particular risks can be an important warning sign. The following strategies have been applied to minimize risks:

- *Conservative estimates* – the scheme assumes a lower ability than assessed to deliver on projected environmental services and incomes.
- *Risk buffer* – in scheme design, a percentage of the estimated environmental services is unavailable for trading.

-
- *Project design* – measures are installed in PES agreements to reduce the impacts of certain risks through, for example, silvicultural practices such as fire management and integrated pest control.
 - *Insurance risk* – schemes intended to support the environmental-service providers may be disproportionately affected by natural disasters. Where payments are dependent on the delivery of specific environmental-service outcomes, factors outside the control of providers may result in their failure to meet contractual obligations and, consequently, in non-payment. Ideally, therefore, participants in PES schemes will employ some type of insurance, such as formal insurance or a risk buffer. Formal insurance policies are rarely used in tropical forestry, although new insurance products are being developed for large-scale companies (Cottle and Crosthwaite-Eyre, 2002). The keys are the cost of such insurance policies, and who bears it. Ideally, PES agreements will include provisions for risk-sharing (or for sharing the cost of insuring against risk) between the sellers and buyers of environmental services.

Environmental and socioeconomic safeguards

To ensure the sustainability of a PES scheme it is critical that the scheme includes, in its design, socioeconomic and environmental safeguards. These are intended to ensure the equitable distribution of benefits, gender equity, and certainty over property rights and economic competitiveness. Such safeguards will help ensure that schemes obtain continued support from the environmental stewards.

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Payments for forest environmental services in sub-Saharan Africa

A practical guide

This publication responds to calls in regional and global forestry forums to strengthen capacity for effectively developing and implementing payment schemes for environmental services in sub-Saharan Africa. In particular, the African Forestry and Wildlife Commission, at its 18th session, called for enhancement of the institutional capacities of member countries and the sharing of knowledge on payment schemes for forest environmental services at the national and subregional levels. The publication focuses on forest-based environmental services, such as carbon sequestration, watershed protection and biodiversity conservation. It comes at a time when forests are at the centre of global responses to the challenge of climate change and when payment schemes for forest environmental services are increasingly seen as a valuable means of generating revenues for local economic development from sustainable forest management. It compiles lessons applicable in sub-Saharan Africa generated by initiatives in the subregion and in other regions relevant to sub-Saharan Africa.

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