

CHAPTER 8

A NEW TOOL FOR SUSTAINABLE FOREST MANAGEMENT IN CENTRAL AFRICA: PAYMENTS FOR ENVIRONMENTAL SERVICES

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Payments for Environmental Services: Background

Tropical forests represent one of the rare ecosystems able to provide an abundance of products and support a diversity of human practices: from villagers seeking a source of natural products, the state seeking to conserve biodiversity, the timber processor, to the Global Environment Facility, which sees it as a carbon sink, the rainforest is multi-purpose and multi-stakeholder *par excellence*.

First and foremost, the tropical forest provides material support for local populations' way of life: the ecosystem is both their environment, a source of raw materials and foodstuffs, and a land reserve for farming expansion. Most people in the Congo Basin meet basic needs by direct exploitation of their environment: fuelwood, timber, game, non-timber forest products (NTFP) ...

Nationally, the rainforest is often viewed as supporting economic development: industrial logging is supposed to generate economic growth, employment and foreign exchange earnings. Most reforms of sub-regional forest policy in the past fifteen years were primarily geared towards improving timber production and processing.

Finally, tropical forests also provide a set of indirect benefits as "natural capital," including the generation of environmental services. The loss of these benefits would diminish the well-being of human societies. Unlike the extractive uses of forest resources, the environmental services provided by tropical forests are not yet incorporated into forest policies, even if all Congo Basin states have signed international conventions on climate change, biodiversity or wetlands. However, as stated in the Millennium Ecosystem Assessment, tropical forests have four functions that cannot be broken down just into the production of material resources.



Photo 8.1: Tropical forests alternate between dense undergrowth and gaps.

Table 8.1: Categories of environmental services provided by forests

Regulatory functions	Productive functions
The forest provides support to economic activities and human well-being by:	The forest provides basic resources, notably:
<ul style="list-style-type: none"> - climate regulation - hydric regulation - protection against soil erosion - maintaining biodiversity - carbon sequestration - recycling organic matter and human waste 	<ul style="list-style-type: none"> - building materials: wood, lianas... - energy: fuelwood... - food resources: non-timber products, game... - medicinal resources - genetic resources
Physical support functions	Informational functions
The forest provides the space and required substrates for:	The forest provides esthetic, cultural and scientific benefits:
<ul style="list-style-type: none"> - habitat - farming zones - recreational sites - conserved natural spaces 	<ul style="list-style-type: none"> - source of cultural and artistic inspiration - spiritual information - historic, scientific and educational information - potential information

There is currently much scientific uncertainty about how these ecological functions play out as well as their interrelations, especially in tropical forests. After their production roles, attention turns to forests' regulatory functions so these can be better integrated into the sustainable management process. Three environmental services are

currently at center of debate - carbon sequestration, biodiversity conservation, and watershed protection - which generate significant economic benefits, as illustrated in the following table, both generally (Pearce and Pearce, 2001), and specifically as in the case of Cameroon (Ruitenbeek, 1990; Lescuyer, 2000, Yaron, 2001).

Table 8.2: Estimation of the main economic benefits derived from tropical forests (in current \$ per hectare)

Goods or services provided by the tropical forest	Tropical forest (Pearce and Pearce, 2001)	Cameroon forest: Korup National Park (Ruitenbeek, 1990)	Cameroon forest: forest concession in the East (Lescuyer, 2000)	Cameroon forest: Mount Cameroun (Yaron, 2001)
Timber	200 – 4,400		580	
NTFP	0 – 1,000	60	1	40 - 70
Tourism	20 – 4,700	20		
Genetic resources	0 – 3,000	7		3
Watershed	150 – 8,500	70		270
Carbon sequestration	360 – 2,200		980	2,260
Benefits of non-usage	50 – 4,400			20 - 30

Thus, these environmental services have a positive impact on human well-being, sometimes greater than the impact from lucrative activities. Such estimates depend on both local and analyst assumptions - on methods and on some variables - and are hard to extrapolate (Lescuyer, 2000). Nonetheless, they indicate the potential importance of certain products or certain ecological functions rarely subject to management measures. As they are rarely subject to monetary transactions, environmental services are difficult to incorporate into forest management. For ex-

ample, unlike the person who fells a tree and sells the timber, there is no payment for protecting the forest, its carbon and biodiversity. But, as true in Central Africa as it is anywhere else, an effective way to change forest managers' behavior is to change the revenues and costs derived from management. A better way to take into account forests' environmental functions involves assigning a price to be paid by the beneficiary of these services which provides an income for the producer/protector of these services. This is the purpose of payments for environmental services (PES).

Implementing Payments for Environmental Services in Congo Basin Forests

The rationale behind PES schemes is simple: external beneficiaries of environmental services make a direct, contractual and conditional payment to the owners or users of the sites if they adopt practices to secure the conservation/restoration of the ecosystem and thereby generate environmental services (Pagiola *et al.*, 2002; Wertz-Kanounnikoff, 2006). In this way, users receive a direct incentive to include environmental services in their land and resource use decisions, which should ideally lead to better resource use than

in the absence of such payments. In theory, the PES contractual mechanisms should have five main features: (1) a voluntary transaction where (2) a clearly defined environmental service (3) is "purchased" by (at least) one individual consumer (4) from (at least) one individual supplier, (5) if and only if the supplier guarantees the continued production of the environmental service (Wunder, 2005). In practice, these conditions are rarely met: PES vary significantly by level (competitive markets, or on the basis of profits made by the

ecological service, or based on opportunity costs borne by the actors involved) and by type of financial¹ transfer (in cash or in kind, through taxes, trust funds, bilateral or multilateral compensation,...). Moreover, biodiversity conservation PES employ three broad types of support:

- *schemes based on area*, where the contract is for a particular space in which all or certain uses are prohibited, such as a first-class protected area;
- *schemes based on products*, where consumers pay a “green” premium in addition to the market price for a property that has been produced in compliance with environmental standards;
- *schemes based on use restrictions* which compensate users for limiting their use of resources, without restriction to a particular area, such as preventing great ape hunting or sea turtle fishing.

There is in fact a continuum of PES initiatives ranging from competitive markets to projects to promote environmental services and regulatory approaches using economic incentives (Grieg-Gran *et al.*, 2005). Whichever form the PES takes, the approach is still recent in Central Africa, and not widely implemented. In the early 2000s, Llandell-Mills and Porras (2002) conducted a broad review of market mechanisms designed to ensure maintenance of several forest environmental services. The only case study from Central Africa in

the report covers the assignment of bioprospecting access rights in Cameroon.

Even today, if we refer to <http://www.ecosystemmarketplace.com>, a PES discussion and promotion group (Katoomba Group), PES implementation in the African rainforest is addressed in five papers, and even then, only partially. Hence there is currently very little PES activity with regard to the Congo Basin forest.

Yet many sub-regional actors are beginning to pay close attention to this type of mechanism. As for donors, the African Development Bank in 2008 launched the “Congo Basin Forest Fund,” with more than \$ 110 million, which will be partly devoted to setting up PES, including the fight against climate change. Similarly, the World Bank, with its Forest Carbon Partnership Facility, and the United Nations - UNDP, UNEP, FAO - have significant funding for implementing sub-regional programs for reforestation or avoided deforestation. Finally, the Global Environment Facility has started a “Strategic Program to Support Sustainable Forest Management in the Congo Basin,” which is also skewed towards PES.

All this funding is for three main environmental services – carbon sequestration, biodiversity conservation, and watershed maintenance – which are just starting to be implemented in Central Africa.



Photo 8.2: Pitsawing is a common activity on the edge of the forest (near Mitzié, Gabon).

¹The opportunity cost corresponds to the sum of lost net benefits due to the loss of access to natural resources.

Table 8.3: Some Clean Development Mechanism projects in Central Africa

Country	Cameroon	Cameroon	Congo	Congo	
<i>Project</i>	Alternative to the decline in old cocoa plantations using mixed species, medium growth plantations on humid savanna	« One Parisian, one tree »	Private woodlands on the Batéké plateaux and on degraded lands of the Pool savannas to supply fuelwood to Brazzaville	Cogeneration CIB	
<i>Localization</i>	Plain of Mbam, municipality of Bokito	Western region	Plateaux Batéké and Pool savannas	Pokola	
<i>Period</i>	To start in July 2009	February 2008 - December 2012	Possible 2009	Possible 2009	
<i>Project Perimeter</i>	At full term, 1,670 hectares of cocoa plantations with mixed cropping	Village plantations over 51 ha in November 2008; 500 ha over time	Plantations for fuelwood over 16,500 ha in 30-years	Energy independence, wood drying and electricity for the town of Pokola	
<i>Species</i>	Cocoa association with fruit species, palm oil, coconuts, forest species (frake and fromager)	Fruit trees, timber species or artisanal species, fast growing exotic species	Plantations of species for charcoal (eucalyptus and acacia)	Development of 90,000 t of wood waste/year and substitution of 6 million liters of gas oil/year	
<i>Project Sponsors</i>	ANAFOR, SODECAO, IRAD	Municipalities of Tonga and Foumban	<i>Ministère de l'Économie forestière</i> by SNR, City of Brazzaville and region of Pool	CIB Group	
<i>Supervision</i>	FUPROCAM, IRAD	<i>Syndicat des Communes forestières du Cameroun</i> , CTFEC, ONFi	SNR via <i>Autorité du Bassin d'Approvisionnement énergétique de Brazzaville</i>	CIB	
<i>Actors</i>	Individual growers in Bokito affiliated with FUPROCAM	<i>Communes</i> of Tonga and Foumban, Community Interest Groups	Private producers (individual and industrial)	CIB	
<i>CDM case instruction</i>	CDM: CASCADe/UNEP (decision January 2009)	CDM: City of Paris	CDM: seeking financing	CDM: PIN/self-funded	
<i>Supporting body</i>	ANAFOR, IRAD	ONFi	SNR, CIRAD and others	CIRAD	

	DRC	DRC	CAR	CAR
	Private woodlands on the Batéké plateaux and degraded lands of Bas-Congo to supply fuelwood to Kinshasa	Carbon sink at Ibi-Batéké	Cogeneration SEFCA	SCAF Plantation on savanna
	Plateaux Batéké and Bas-Congo	Plateaux Batéké	Mambéré-Kadéi and Sangha-M'baéré	Liboko
	Possible 2009	To start in January 2008	Possible 2009	Possible 2010
	Plantations for fuelwood over 112,000 ha in 30-years	Plantations of timber and fuelwood over 8,000 ha in 30-years	Energy independence, wood drying and rural electricity	Industrial timber plantation
	Plantations of species for charcoal (eucalyptus and acacia)	Eucalyptus, acacia and local species	Development of 59,000 t of wood waste/year and substitution of 942,000 liters of gas oil/year	Teck plantation
	<i>Ministère de l'Environnement</i> and provinces of Kinshasa, Bas-Congo and Bandundu	Fondation asbl Novacel sprl	SEFCA Group	SCAF Group
	SNR via <i>Autorité du Bassin d'Approvisionnement énergétique de Kinshasa</i>	Novacel sprl and Gi Agro asbl	SEFCA	SCAF
	Private producers (individuals and industrial)	Private company and local community	SEFCA	SCAF
	CDM: CASCADE/UNEP (decision January 2009)	CDM: World Bank (Biocarbon Fund) + CASCADE	CDM: PIN/CBFP- CDM	CDM: PIN/PDD through self-funding
	SNR, CIRAD and others	FRM then ONFi	CIRAD	FRM

PES and Climate Change

Undoubtedly, carbon sequestration represents the most interesting environmental service and the one with the highest expectations. This is linked to the scale of the issue and the funds available. The payment mechanism for maintaining or restoring this service assumes three main forms: Clean Development Mechanism (CDM), Reduction of Emissions linked to Deforestation and Degradation (REDD), and initiatives linked to voluntary markets. None of these mechanisms are operational in the Congo Basin, or registered with the United Nations Framework Convention for Climate Change (UNFCCC). On the other hand, numerous project ideas have come to light in the sub-region in recent years.

First, under the Kyoto Protocol, all Central African states and a number of private actors are initiating afforestation/reforestation projects to benefit from CDM. The following table presents some of these initiatives. Several have been formalized in documents known as PINs (Project Idea Notes) prepared by designated national authorities in sub-regional countries while others are individual efforts. In both cases, the design of a CDM project is long and complex and requires a variety of skills.

Since 2005, a second new approach has been under discussion to include “avoided deforestation” in the collection of Protocol instruments: the famous REDD process, which aims to compensate efforts to prevent deforestation and forest degradation, and thus the release of greenhouse gases at the end of the next post-2012 commitment period, that is, starting in 2018. This tool is the subject of much debate and encounters still

unresolved methodological difficulties. The issues regarding this financial mechanism are discussed in detail in chapter 11. In general, all sub-regional countries have drafted documents called R-PINs (Readiness Plan Idea Notes) submitted to the World Bank’s Forest Carbon Partnership Facility to develop a national strategy for avoiding deforestation. These R-PIN include roughly the same four headings: consultation with stakeholders, developing a baseline project, drafting the national strategy, and developing a monitoring system.

In addition to these R-PINs, the Congo and DRC have also written papers on PIN REDD initiatives, in both cases to guarantee wood energy supply in Brazzaville, Kinshasa and surrounding areas.

Finally, surfing the wave of climate change, many carbon sequestration/storage initiatives do not originate directly from the Kyoto Protocol. Difficult to identify, these voluntary measures are usually implemented by environmental NGOs with private (often international) funding for their mission. The reforestation project initiated by WWF and MTN (Mobile Telephone Network) in northern Cameroon is such an example. A number of CDM projects currently facing important methodological difficulties will probably switch to the voluntary market, where criteria are less stringent. But unlike CDM or REDD projects, such voluntary measures are not recognized by the UNFCCC and cannot be used to achieve quotas of greenhouse gas emissions. They therefore enjoy a lower price per metric ton of carbon sequestered (Hamilton *et al.*, 2008).



Photo 8.3: *Koko leaves (Gnetum sp.) are commonly consumed by rural populations.*

An Innovative Way to Conserve Biodiversity

In recent years, biodiversity has become the second PES environmental service in the sub-region. There are direct incentives for biodiversity conservation in which compensation depends upon the level of biodiversity. They differ from more conventional approaches which either provide alternative activities to biodiversity exploitation (game farming, micro-development, agricultural intensification ...) or develop profitable but sustainable uses for biodiversity (tourism, recreational hunting, crafts, sale of non-wood products ...). In both cases, the link between financial support and the level of biodiversity is indirect at best (McShane and Wells, 2004). On the contrary, a PES depends directly on conserving the biodiversity we seek to maintain: the degradation or disappearance of the resource means the payment is reduced or cancelled.

There are several initiatives in Central Africa to compensate protectors of biodiversity. There are three types: “freezing” potentially exploitable areas to promote conservation; the labelling of goods produced in compliance with specific environmental standards; and restrictions on practices impacting biodiversity in and around protected areas. Table 8.4 summarizes these initiatives and their implementation in Central Africa.

Conservation concessions represent the most recent approach in the Congo Basin. The objective is to convert areas earmarked for logging into protected areas, the shortfall being offset by domestic and local financial flows, or investment in kind from the conservation concession manager (Niesten and Rice, 2004). No projects have started yet in Central Africa, but WWF and CI have made three proposals: in the special dense forest reserve of Dzanga-Sangha in CAR; for the Ngoyla-Mintom forest area in Cameroon (Usongo *et al.*, 2007); and for a bonobo conservation concession in DRC (Conservation International, 2008). The goal is to conserve the habitat of several major species of large mammals, especially apes and elephants. These conservation concession proposals have yet to convince the national governments to whom the land belongs. The reluctance of public authorities can almost certainly be attributed to the opportunity cost of these conservation concessions - estimated at € 13 million per year for the Ngoyla Mintom forest (Karsenty, 2007), and almost € 10 million for the forest reserve of Dzanga-Sangha (Lescuyer, 2008) - as well as the complexity of national and local institutional arrangements to put in place.

The trend is reversed when we look at the number of FSC-certified forest concessions in the

Table 8.4: Current state of PES for biodiversity in Central Africa

	PES based on area: conservation concessions (proposed)	PES based on products: FSC - certified forest concessions	PES based on restricting usage in/around protected areas
Country	Cameroon (2007): Ngoyla Mintom (550,000 ha) CAR (2006): Special dense forest Reserve of Dzanga-Sangha (230,000 ha) RDC (2008): Bonobos conservation concession (680,000 ha)	Cameroon: Wijma (2 concessions, 97,100 ha); Pallisco (6 concessions, 341,700 ha); SEFAC (4 concessions, 314,600 ha); TRC (1 concession, 125,500 ha) Congo: CIB (2 concessions, 748,200 ha) Gabon: CEB (2 concessions, 616,700 ha), Rougier (3 concessions, 688,200 ha)	Cameroon: Compensation for halting turtle fishing (Campo Ma'an National Park) RCA: Compensation for reporting poachers (Dzanga and Ndoki National Parks) DRC: Compensation for reporting poachers (Garamba National Park) DRC: Creation of the Tayna Nature Reserve by local communities Equatorial Guinea: compensation for damage caused by wildlife (Monte Alén National Park)
Area (ha)	1,460,000	2,932,000	

sub-region. Most European forest companies are now committed to this process, although few have received final certification. By early 2009, three million hectares of forest should be managed in compliance with the “principles and criteria” of FSC in the Congo Basin. Compliance with FSC criteria requires the demarcation of areas with high conservation value and effective integration of local practices into forest management.

However, there are two reasons why forest certification represents an indirect incentive rather than direct payment for biodiversity conservation. For one, the “green premium” associated with certified products still has little weight today: it is not enough to convince a company to manage its forest and hence biodiversity better. Moreover, the surcharge paid by the final customer can be linked to a number of virtues associated with certified products, with biodiversity

conservation being only one among others – legal compliance, empowerment of indigenous peoples ... Thus only a small part of the certification premium can be linked to biodiversity protection.

Finally, PES for biodiversity conservation also takes the form of a contractual arrangement between the protected area manager and local people. People are rewarded for their help in maintaining certain animal populations - such as sea turtles in Cameroon or great apes in DRC - or for their efforts in reducing pressures on biodiversity, including poaching. These types of agreement are still rare in Central Africa.² Based on a survey of 30 protected areas in the Congo Basin, Tchifofo (2008) observes that only five instances of direct compensation for users’ right restrictions currently exist, even though almost all these protected areas offer indirect and/or semi-direct incentives for biodiversity conservation.

Financing Watershed Protection

Most Central African watersheds are covered with forest, which enhances the quality and regularity of water flows. However, it remains difficult

predominantly forested watersheds (Lescuyer and Bravi, 2004). On another scale, Ivindo National Park in Gabon helps ensure the high water quality of the Ivindo River, but it is only a secondary tributary of the Ogooué River, which itself flows through sparsely populated areas. In most Central African cases, access to water resources is not yet a problem. Finally, there are generally still few data on the relationship between forest ecosystems and water resources in Central Africa, which gives rise to much scientific uncertainty about how effective the forest’s environmental role is (Bruijnzeel and Critchley, 1994).

Despite these difficulties, two PES for watershed protection are being developed: one in Gabon and one in Cameroon.

Proposed by WCS to the Global Environment Facility, the project "Sustainable Management of the Mbé River Forested Watershed through the Development of a Payments for Ecosystem Services Mechanism" aims to strengthen the protection of the river Mbé watershed, which is both the main source of drinking water and electricity for Libreville and an area of high conservation value. Located in Monts de Cristal National Park, the Mbé Forest plays several ecological functions, reducing sedimentation of reservoirs used by the power plant, preventing flooding and protecting the mangroves, which are major spawning grounds. The project objective is to test a PES mechanism in 100,000 ha of the Mbé River catchment area to compensate actors for preventing degradation



Photo 8.4: *Water, a valuable commodity, is abundant in the region.*

to link forest cover and the quality/quantity of water used in urban centers where most demand takes place. In Cameroon, for example, the water used in Yaounde and Douala does not come from

²No example of such a PES is explicitly mentioned in the Landscape presentations.

of forest cover and natural resources. The same logic drives WWF-CARPO to consider creating a PES scheme for Lake Barombi-Mbo, overlooking the town of Kumba in Cameroon. The crater lake has had Forest Reserve status since 1940; however, this has not prevented the area from suffering considerable damage for many years. Yet this lake is a major reservoir of drinking water, an ecological function that is now threatened by the fast disappearance of the surrounding forest. Economically, a PES payment for forest protection in this watershed could be a more viable solution than seeking an alternative drinking water source for Kumba.

These two testing-grounds will only be implemented at best by 2010. It is now clear they raise more issues than they solve. Nonetheless, widespread PES application in the sub-region must first transit through the implementation of such pilot projects. Although PES literature is abundant, there has hardly been any implementation in Central Africa. However, these direct incentive approaches are currently considered a promising solution by many managers. Firstly we need to consider the relevance of, and implementation conditions for, such incentives in the Congo Basin.

PES Issues and Constraints in Central Africa

Is There a Market for Environmental Services from Tropical Forests?

A payment mechanism for producing or protecting an environmental service implies a permanent and solvent demand for this service. Carbon sequestration is a good example as numerous funds and considerable funding exist for such initiatives, even though REDD implementation conditions remain unclear. On the other hand, biodiversity conservation remains fully problematic for two reasons. First, it is not easy to link biodiversity to a specific environmental service with a clear and direct impact on human well-being. As illustrated in the Millennium Ecosystem Assessment (2005), biodiversity helps maintain key ecological services on the planet without any direct connection to producing an environmental good or service. Thus, unlike the more traditional PES for water or carbon for example, users who pay for biodiversity know they are paying for an environmental service that does not directly alter their level of well-being because the biodiversity-ecosystem-human well-being relationship is still poorly understood (Ridder, 2008). Secondly, for a PES to be sustainable, the beneficiaries of environmental services – i.e., potential buyers – often have to be richer than those helping to produce or protect the service. Therefore, payments for biodiversity conservation can only come from companies or the international community, the only solvent and politically acceptable “buyers.” The problem is similar for watersheds or carbon. The primary condition is that some actors are willing to finance the PES. To be effective, these funds have to change the behavior of actors in relation to maintaining one or several environmental services. This is the famous criterion of additionality, that says that activities that would have occurred

without introducing the PES scheme should not be funded. Specifically, an environmental service must be threatened by human practices to be eligible for a PES. If agents are not capable or do not have the opportunity to clear forests, to impact biodiversity or degrade a catchment area, there is no reason to pay them to guarantee these environmental services as this is what they would have done anyway. Local practices have a clearer impact on biodiversity: the populations of flagship animal species are declining almost everywhere partly because of big game poaching for commercial trade. In most cases, these practices are carried out via local people who continue to manage and control access to hunting areas (Nasi *et al.*, 2008). This is thus an instance where local actors pose a real threat to biodiversity and where a PES would represent a real incentive to change practices (Pagiola *et al.*, 2005). However, if local people are actually involved in the illegal commercial hunting trade, the main beneficiaries are generally poachers from outside. Thus the opportunity cost of curbing the hunting of these species would be relatively modest for local people. Such a context would seem to favor setting up a usage restriction system since modest compensation for local people may be enough to halt these practices and bring local people back into full legality

Securing Legitimate but Illegal Rights

Compensating actors for conserving environmental services they are used to degrading is equivalent to purchasing some of their user and access rights to natural resources.³ However, these rights

tional way of enforcing a legal and still credible restriction, for example on the edge of protected areas where there is minimal control of human activities (Arnoldussen *et al.*, 2008). However, this combination of legal repression and economic incentive still requires a change in the way local managers think and in local people's legitimacy in the context of conservation activity.

These legitimate user and access rights to resources have the advantage of being generally based on local institutions, which can provide the foundation for creating a PES. Across Central Africa, people have appropriated areas and established key principles for land and resource use (Diaw, 1997). Still we should not have an idyllic view of these institutions as the way they function often has little to do with sustainable and harmonious community management of resources. In general, there is a multitude of flexible and adaptable rules, ambiguous sources of authority, heterogeneous communities ... (Geschiere, 1982; Le Roy *et al.*, 1996). A PES requires a field-level institution or organization capable of becoming a credible partner in such a contract. Two minimum requirements must be met:

1. The institution must have legitimate authority in the eyes of the people concerned, raising the question of how to define a community. Most decentralized management experiences in Central Africa equate the community - social entity - to a village - a geographical unit that, most often, had been created by colonial authorities. This is one of the main reasons why most of these experiments failed (Karsenty, 2008). Despite legal recognition, most villages are made up of a series of lineages or families, which are the real institutions regulating land access and use (van den Berg and Biesbrouck, 2000; Lescuyer, 2006). Thus, legitimate community institutions should be designed at this decision-making level to have any real impact on resource users. Families and lineages have the added advantage of being flexible enough to integrate people originally from outside the community but who have been assimilated through land allocation for example.
2. The institution must be capable of monitoring both internal and external individual rights in the community. Resisting outside pressures generally necessitates legal status to act and carry out sanctions beyond the local level: this can involve legalizing the institution or operating partnerships with influential external actors (NGOs, businesses, administrations, projects ...).



Photo 8.5: “Collaring” is a common trapping method.

are not always legal even if stakeholders consider them legitimate. In Central Africa, local people commonly practice commercial hunting but the practice is nearly always banned under the Forest Code. The same is true of opening fields/plantations in forest concessions. Yet these legitimate but illegal practices often have a major impact on the state of the forest, and should be modified through economic incentives. But should people who degrade resources illegally receive compensation? Compensation mechanisms may encourage law-compliant actors to resort to illegality to benefit from this compensation, with the risk of spreading a “payment right” claim. However, this risk is lessened when the PES strengthens poorly enforced regulations and is used to partially cover the opportunity costs associated with implementing these regulations. Thus it represents an addi-

³This can be translated by compensating the populations to protect some resources against outside pressures such as poachers, for example. But there again, poacher access to the village hunting grounds is generally considered a legitimate right by people and it is more often than not a reason for remuneration. Paying local people to combat poaching means taking away their right to let poachers enter.

These institutions may also find it tricky to regulate the uses of group members, especially for partial or total restriction (Hackel, 1999). In Central Africa, user rights are acquired and updated through usage of an area or resource, not through maintenance. PES implementation for biodiversity conservation means turning this paradigm upside down. This can only be done through regular payment of adequate compensation in a context of secure but unused rights.

A major problem for decentralized resource management in Central Africa is the lack of local institutions credible enough and able to enter into a contract. It is probably more sustainable to work with established social entities, such as lineages, than to set up more specialized village

committees. Several examples show that these local institutions can be strengthened through building capacity so they can finally commit to, and comply with, contracts for natural resource use (Bigombe Logo, 2004).

Ownership of future royalties from PES implementation will undoubtedly be an important issue for forestry sector actors in the years to come. Good governance will be a central issue in future discussions. Will this benefit local “elites” able to capture these new profits or will it be a springboard for a new sustainable development model based on communities? What role will the national governments and its decentralized agencies play? The question remains open and the answers are in the hands of African stakeholders themselves.

PES and Opportunity Costs

Convincing users to surrender some of their rights to protect environmental services requires the proposed compensation to be greater than the benefits users would earn by continuing their practices. In economic terms, the PES must be greater than the opportunity cost borne by the actor if he accepts the PES and subsequently limits his/her practice.

Estimating opportunity costs is a delicate exercise, particularly in Central Africa where, unlike the static vision of low or non-existent technical change over time (Ferraro, 2002; Wunder, 2006), the socio-economic situation in rural areas has experienced important dynamics in recent years: higher prices for agricultural materials, more chainsaws and motorcycles, easier (and illegal) individual logging of timber, restitution of some forest royalties ... There has been a tendency towards higher rural incomes in the last ten years, as evidenced by some recent studies in Cameroon in particular (UNDP, 2006; Toison, 2008). The baseline scenario “without carbon sequestration” or “without biodiversity conservation” is indeed a development scenario, resulting in a progressive, albeit moderate, rise in income and greater forest resource utilization. On a small-scale or project scale, any evaluation of opportunity cost should incorporate income changes that can be objectively expected in Central Africa in the medium and long term. The same is true for a national approach to the REDD mechanism for example, although in practice the current price of a metric ton of carbon leaves little doubt about the ability of the PES to exceed opportunity costs.

Transaction costs to set up and operate a PES may also represent a major brake in Central Africa. These costs are generally estimated at between 5 to 25 % of the operating budget (Ferraro and Kiss, 2002; Grieg-Gran *et al.*, 2005). In Central Africa, where rural populations are dispersed and generally have limited technical capacity, transaction costs are likely to be high. Local monitoring of environmental services often represents a substantial cost, but can also be an effective way for the stakeholders themselves to appropriate the PES. In any case, such a mechanism seems unlikely at present unless a supporting actor absorbs part of the transaction costs. This is the case in protected area buffer zones where managers support local organizations to help local stakeholders become organized and to suggest discussion fora. In addition, a national PES, such as REDD, will undoubtedly help reduce transaction costs, at least after the negotiation, development and learning phases.



Photo 8.6: Pineapples and bananas are consumed daily in Central Africa.

To be effective, a PES must convince buyers that the service is, and will be, effectively provided by the suppliers for the period stated in the agreement. The primary objective of these mecha-



Photo 8.7: Traditional house in Mount Oku.

nisms is environmental: the non-delivery of the environmental service means payments will stop. To be effective, the PES should thus target the actual producers of the environmental services and pay them a fair price, i.e., at least the opportunity cost they incur by engaging in this activity. Such an arrangement is more complex when it targets the poor and when the PES is viewed as a means of alleviating poverty (Corbera *et al.*, 2007). A PES will have at least two types of effect on living standards in rural areas: effects on environmental service providers and effects on non-suppliers who live in the same communities.

Even if the goal is primarily environmental, the PES may actually increase the living standards of the service providers if the proposed income exceeds the transaction and opportunity costs and is based on a baseline scenario for regular development in the area. Thus, the PES must meet stakeholders' legitimate aspirations to increase standards of living consistent with what they could reasonably expect without PES implementation. Can we sustain an effective PES designed solely for environmental service providers in the segmentary societies of Central Africa where egal-

itarian sentiment is dominant? A compensatory mechanism for only some people might create tensions among community members, and could lead to resource degradation from retaliation. By not bowing to the social community order, the PES could lead to private appropriation of collective resources and the generated funding, ultimately leading to a rejection of the mechanism (Karsenty and Weber, 2004). In addition, in the spirit of fairness, there is no shortage of pro-indigenous voices to defend the principle of equal pay for communities adopting "secular" forest conservation practices.

The distribution of PES benefits is a major issue in Central Africa. One option would be to share these benefits with all community members, irrespective of producers and non-producers of environmental services. But besides the fact that the payment would no longer be an incentive for producers of environmental services, current community organizations in Central Africa which manage such collective income (from community forestry, forest fees, ...) also face difficulties and do not always have a real impact on local development (Oyono, 2005; Assemb Mvondo, 2006). If the PES must increase the living standards of environmental service providers to be accepted, it cannot by the same token be a tool for supporting rural economic development. To remain effective and be socially acceptable, a PES should probably be linked to the introduction of other indirect and semi-direct incentives systems for stakeholders besides providers of environmental services and which share conservation benefits more equally.

Conclusion

Even with few practical examples, PES are of interest to a growing number of stakeholders in the Congo Basin. The probable implementation of the REDD mechanism within a decade (with current indications that massive funding will be available) should lead to an expansion of all PES. But all the REDD structures being considered are not equally favorable to the PES, in particular the balance between carbon and biodiversity. The dominant option at present is to pay governments based on a quantified target for avoided deforestation at national level, in which the national government (not decentralized actors) sells carbon credits on the market. This poses a double constraint for PES promotion in the Congo Basin. For one, it is not clear that governments will use the funds from REDD to launch national PES programs covering biodiversity and watersheds. Furthermore, since "REDD payments" will only start by 2018, bridging in the form of "funds" or voluntary programs will be needed to launch PES. In summary, if REDD really represents a major opportunity for setting up PES for not emitting carbon in Central Africa, existing regional initiatives tend to show that other envi-

ronmental forest-related services are often mentioned but not incorporated into these projects. PES implementation for biodiversity or watersheds still depends heavily on funding and specific experiences. PES are primarily environmental management tools. However, implementation in Congo Basin countries means their economic efficiency should be linked to relative social equity. Locally, the PES must be estimated on the basis of opportunity costs incurred by people involved in the mechanism. The baseline scenario used to estimate these opportunity costs must reflect the current development of rural economies in Africa and an increase in living standards. However, the PES should not be regarded as the main instrument for poverty alleviation. Even though PES can actually improve the living standards of environmental services providers, they must be combined with other development support approaches to achieve a more egalitarian distribution of benefits within communities. Their effectiveness ultimately depends on careful integration into ambitious sustainable development policies at local and national levels.

