

Impacts of community forests on livelihoods in Cameroon: Lessons from two case studies

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SUMMARY

Community forestry is considered a tool for decentralisation and devolution and as efficient strategy to achieve the multiple goals of sustainable resource management and poverty alleviation. However, evidence worldwide has shown mixed results. A financial, economic and environmental cost-benefit analysis of two community forests in Cameroon revealed that community forests are economically and environmentally profitable, and benefit communities more, compared to a baseline situation. Sharp differences between the economic and financial returns highlight the importance of conditional factors. These include the communities' technical and managerial skills, access to finance, legal resources and market information, and the communities' capacity for vertical integration. The cases highlight the limitations of the current regulatory and policy framework as a determining influence on the exploitation of community forests and conclude there is a pressing need for institutional and organizational reforms within the governmental and support apparatus to increase the profitability and equity of community forestry.

Impact de la foresterie communautaire sur les communautés au Cameroun: Leçons tirées de deux études de cas

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La foresterie communautaire est considérée comme une stratégie efficace de décentralisation et dévolution pour accomplir les objectifs d'une gestion durable des ressources naturelles et de lutte contre la pauvreté. Malgré tout, les études réalisées sur le sujet montrent des résultats mitigés. Une analyse de coûts et bénéfices financière, économique et environnementale de deux projets de foresterie communautaire au Cameroun révèle que les forêts communautaires sont profitables aux niveaux économique et environnemental pour les communautés impliquées, lorsque comparées à une situation sans forêt communautaire. Toutefois, de nettes différences entre les rendements économiques et financiers mettent en évidence l'importance de facteurs conditionnels, incluant les compétences techniques et managériales des communautés, l'accès au financement, aux ressources juridiques et aux informations sur le marché, ainsi que la capacité des communautés à s'intégrer verticalement dans la chaîne de production des produits forestiers. L'étude souligne les limites du régime de réglementation et de politique forestière actuel en tant qu'influence déterminante sur l'exploitation des forêts communautaires, et conclut qu'il y a un besoin pressant de réformes institutionnelles et organisationnelles au sein de l'appareil gouvernemental pour accroître la rentabilité de la foresterie communautaire.

Impacto de los bosques comunitarios en los medios de vida en Camerún: Lecciones de dos estudios de caso

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La silvicultura comunitaria se considera como una herramienta para la descentralización y la desconcentración y como una estrategia eficiente para alcanzar los diversos objetivos de una gestión sustentable de los recursos y la reducción de la pobreza. Sin embargo, la evidencia en todo el mundo ha dado resultados mixtos. Un análisis de costo-beneficio financiero, económico y ambiental de dos bosques comunitarios en Camerún reveló que los bosques comunitarios son rentables económica y ambientalmente, y que en comparación a una situación sin bosques comunitarios, beneficiar más a las comunidades. Grandes diferencias entre los rendimientos económicos y financieros resaltan la importancia de los factores condicionantes. Estos incluyen: las habilidades técnicas y de gestión de las comunidades, el acceso al financiamiento, los recursos legales y la información de mercados, además de la capacidad de integración vertical de las comunidades. Los casos ponen de relieve las limitaciones tanto de las políticas como del marco regulatorio vigente en tanto influencias determinantes sobre el aprovechamiento de los bosques comunitarios y se llega a la conclusión de que existe una urgente necesidad de reformas institucionales y de organización dentro del aparato gubernamental y de apoyo para aumentar la rentabilidad y la equidad de la silvicultura comunitaria.

COMMUNITY FORESTRY

Community forestry (CF) has evolved significantly since its origins in the deforestation of the 1970s (Diaw *et al.* 1997, Davis 2008). Seen as a strategy for sustainable resource management and to alleviate rural poverty, community forestry initially focused on participatory management in forest regeneration (Bray *et al.* 2005), largely in East Asia and Central America. The concept was slowly incorporated into tropical and timber abundant forest management, together with increased recognition of the (continuing) role of forests as common pool resources, and the significance of locally lead management initiatives. This contributed to a revival in community led initiatives in the 1980s (Arnold 1992). By the early 1990s, evidence from the development and testing of institutional approaches in community forestry lead to a conviction that devolving forest management to local communities could empower people, reduce poverty and protect forest resources (Pulhin *et al.* 2009, DfID 2001, Vabi *et al.* 2002). In the 1990s, community forestry continued to promote decentralization and devolution of power to solve multiple issues plaguing developing countries (Shyamsundar and Kramer 1996, Ezzine de Blas *et al.* 2008). Decentralization was positively associated with reducing bureaucracy and corruption, with sustainable natural resources management, empowerment and socio-economic development gained through community participation in management and thus increased justice and equity (Oyono 2005). However, democratic forest management decentralisation has rarely been implemented in practice: substantial decision-making power, resources and benefits from forests are still centralised, and local actors selected to receive new authority are often neither representative nor accountable and create new institutions that have unexpected impacts, including being disadvantageous for poor local people (Larson 2004). McDermott and Schreckenber (2009) also highlight equity issues, concluding that while community forestry can reduce social inequity, it generally does so by generating positive change at community and higher levels, rather than by delivering benefits directly to poor and marginalised households. Despite these drawbacks, Charnley and Poe (2007) conclude that community forestry continues to promise a viable approach to forest conservation and community development but that major gaps remain between theory and practice, particularly where the devolution of management authority from states to communities with local control over forest management appears to have more ecological than socioeconomic benefits. Larson *et al.* (2010) highlight that the continuing trend of tenure transfer of around 200 million hectares of forests to communities living in and around them raises critical questions about the rights, actual practices and consequent impacts on forest conditions and community welfare. Whilst the new rights and responsibilities vary considerably across the world, with some

being significant, new statutory rights do not automatically result in rights in practice. A variety of institutional weaknesses and policy distortions act to limit the impact of such changes. However they make a strong case, based on over 30 cases (including Cameroon), that the benefits of community forest management can be both effective and fair, whilst pointing out that there remains an urgent need for more supportive policies that are properly implemented.

COMMUNITY FORESTRY IN CAMEROON

One of a handful of countries to embrace these concepts, Cameroon revised its environmental laws, enacting the 1994 Forestry, Wildlife and Fisheries legislation (N° 94/01), the first in Central Africa to introduce community forestry. The explicit stated triple goal was to promote participation in forest management, sustainable management of forests and alleviate poverty. Cameroon was seen, and saw itself, as a regional leader in sustainable forest management (Topa *et al.* 2009). It aimed to increase the economic, political and social potential of its substantial forest resources, particularly the lowland humid, timber rich forests — covering 58% of total surface area, despite having one of the highest national population densities in Central Africa (Cerutti, Ingram and Sonwa 2009, de Wasseige *et al.* 2009). Decentralization and community-based management of resources were promoted as a means to do this, via pressure and support from influential organizations such as the World Bank, donors and bilateral financial institutions. International non-governmental organisations (NGOs) were also convinced of the CF approach (Cuny *et al.* 2007, Vabi *et al.* 2002), believing it to be a cost effective strategy to enhance livelihoods and reduce vulnerability through the direct provision of income and employment (DFID 2001). This is thus not a homegrown initiative but the result of international trends. The high profile focus on CFs and desire of neighbouring countries to emulate Cameroon's legislation, lead to neighbouring states such as Gabon, Congo and the Democratic Republic of Congo to keenly follow Cameroon's progress, adapt and experiment with similar models.

Decree 95/531/PM of August 23 1995 accompanying the 1994 Forestry Law established the legal requirements and steps to create a CF. This enables communities to gain the exclusive management and production (but not property) rights up to 5000 hectares of forest resources in the non-permanent forest domain¹ for up to 25 years. A lack of dissemination of information about CFs in rural areas made initial progress in obtaining a CF in Cameroon extremely slow and led to a clarification of the procedures in a Manual of Procedures and Norms for the Management of Community Forests (MoP) in 1998, becoming a legal instrument in 2003. This was revised through a long, consultative process starting

¹ The 1994 Forestry Law distinguishes between *permanent forest domain*, including protected areas, council forests and logging concessions, and is land solely allocated for sustainable managed forestry or as wildlife habitat and *Non-permanent forest domain* not requiring long-term forest maintenance and includes areas for sales of standing timber up to 2500 hectares, private, communal and community forests.

in 2007. The revised MoP, decreed in February 2009 (Ministry of Forestry and Wildlife 2009), was finally published in December 2009 at a launching workshop in Yaoundé.

The first stage of the CF process is to reserve the forest. Initially, the community is required to create a legal entity, known as a forest management institution, recognized by Cameroon law to represent the population. While the meaning of “community” is not discussed, this article implies that traditional lineage authorities are not legal entities and not appropriate for a CF. The legal entity submits an application for approval by the Ministry of Forests and Wildlife (MINFOF) to reserve the desired forest after a series of community and legal consultations. The second stage concerns producing a CF Simple Management Plan (SMP), including a socio-economic survey of the community, a forest inventory comprising a timber stock assessment, planned exploitation activities and a program of development actions to be realized with the exploitation revenues. While not explicitly mentioned, the 94/01 Forestry law focuses on timber exploitation and does not mention other income generating activities. After the approval of the SMP, a CF management convention is signed, serving as the contract between the state and the community, and the official exploitation stage of the CF begins.

The first CF in Cameroon started in 1997 and by 2000 there were 82 CFs (Djeumo, 2001). This low level of uptake was due to both the lack of knowledge and understanding of the concept by communities, and the financial means needed to jumpstart exploitation. This leads to agreements between CFs and commercial operators, exploiting CFs to access to timber resources otherwise inaccessible (Ezzine de Blas *et al.* 2008). With Cameroon serving as an incubator for experiments in the sub-region, numerous organizations and networks became involved and the situation was widely discussed, driving the Cameroonian government to adopt two enactments in 2001: the right of communities to start exploiting from approval of the forest reservation (*droit de pre-emption*) to gain financial resources; and the right to exploit their forest (*en régie*), without any commercial partner (Fomete *et al.* 2006). These measures shifted competences from forest industries to local communities and made CFs appear more financially interesting for communities (Brown 2002). By early 2002, there were 138 applications awaiting approval, 38 CFs reserved and preparing their SMPs and 24 management conventions signed (Brown, 2002). Numbers of new CFs reached a peak in 2004. By 2006, 378 application files had been received by MINFOF, 78 CFs reserved and 42 had an approved SMP and were waiting for convention signature. By mid-2010, 457 CFs were at some stage in the process although only 20% had actually gained full CF status (Ministry of Forestry and Wildlife 2010). These are situated across Cameroon’s diverse ecological, political, economic and institutional landscapes; however 86% are located in the lowland forest zone, with timber exploitation being their major objective.

Power and control are implicit in notion of CF, as it offers communities a means to legally control and access land and valuable forest resources for financial rewards. This is

arguably the major interest of communities, above environmental or conservation reasons (von Stieglitz 1999, Lachapelle Smith and McCool 2004). CF makes it possible and attractive for communities to address formerly inequitable access and control by the government and elites. The danger and actuality however has been that these parties co-opt the CF process and its reforms to continue their access to valuable timber resources (Oyono 2004, Karsenty 2009).

Despite over a decade of experience and studies, it is still debated if CFs are worth it (Brown 2003). A response is hindered by insufficient primary data and largely descriptive and qualitative studies coupled with a lack of critical analysis of the actual costs and benefits of CFs (Vabi 2002: 9). Empirical examples are rarely documented and when evidence exists, “there are good reasons for thinking many of the claims about benefits are inconclusive” (Gilmour *et al.*, 2004: 3). Though the incomes and profitability of CFs in Cameroon have been studied (Ezzine de Blas *et al.* 2008, Klein, *et al.* 2001, Fomete *et al.* 2001, Vabi 2002, Akoa, 2007) the combination of a rigorous analysis including start up and operational costs, economic and financial costs and benefits, and the distribution of costs and benefits within the communities is lacking. These gaps inhibit a holistic understanding of CFs and the mechanisms. Few studies have valued ecosystem services and almost all have been based on CFs not yet exploiting timber. While there is a bias in establishing profitability in a functioning CF, the costs and benefits incurred as well as the obstacles faced to maintain a CF in exploitation stage provide key insights both of the past and to inform future developments. It is in this context that this study attempts to answer whether a CF is a cost efficient strategy to improve the livelihoods of communities with a CF and to clarify the factors affecting its viability. Cost-benefit analysis has long been used as economic and policy tool to rationally compare gains and losses, and has increasingly incorporated environmental aspects (Pearce 1998, Pearce, Atkinson and Mourato 2006). Advances in methods have standardised placing monetary values on non-market goods, but issues such as the complexity, irreversibility and uniqueness of ecosystems; equity and discounting issues and dealing with risk and uncertainty remain problematic (Hanley 2001, Price 2000, Pearce, Atkinson and Mourato 2006). As with many tools, CBA has both strengths and weaknesses. CBA is a good indicator of economic efficiency in resource allocation, its process forces participants to identify all costs and benefits, and it incorporates environmental social values in decision making. However, it needs to be borne in mind in the resulting assessment that the robustness of results depends on the ethical incorporation of the cumulative and indirect effects surveyed (Hanley 2001).

METHODS

As part of a wider study in Cameroon using a common methodology (Ingram *et al.* 2010), three criteria were used to select the CFs:

- 1) The CF has been exploiting timber for at least two years
- 2) The CF is functional and accessible (due to the short study period) and
- 3) Willingness to be interviewed and availability of local MINFOF and village authorities.

Recommendations from actors in the Cameroon forestry sector were used to avoid research fatigue of CFs. The two community forests selected were Common Initiative Group² (GIC) Doh and COVIMOF (Communauté Villageoise de Melombo, Okekat et Faekel³). The research design was aided by the Center for International Forestry Research (CIFOR) with the support of MINFOF, the Renforcement des Initiatives pour la Création Communautaire des Ressources Forestières et Fauniques (RIGC) project, and the Netherlands Development Organisation (SNV) and the Réseau Forêt Communautaire (RFC). Primary data was collected using three questionnaires: a structured household questionnaire, a semi-structured interview and a market survey questionnaire. The household questionnaires gathered information on the socio-economic characteristics, timber and non-timber forest products (NTFPs) harvesting habits, agricultural and other economic activities. Semi-structured questionnaires were used for group discussions with different populations (elders, men, women and youth) and key informants, eliciting information on the creation and functioning of the CFs, the evolution, quantity and quality of ecosystem services provided by the forest, and costs and benefits during three phases: 1. Reservation: from sensitization activities to approval; 2. Preparation of the SMP; from approval to signing the management convention 3. Exploitation: from the start of income generating activities to date. Documents from the CF and market surveys provided information on costs, revenues and prices of timber, non-timber and agricultural products, including fertiliser, to calculate soil fertility. To complement the questionnaires, forest transects, observation, consultation meetings with local authorities and actors involved in the CFs and market visits were used. Time constraints prevented further gathering of primary data on the distribution of benefits and equity issues within communities.

Direct valuation of agricultural, timber and non-timber and other revenues and costs were obtained during household and semi-structured key informant interviews, CF records, market observations and cross checking against literature. Indirect-use valuation methods were used to value ecosystem services. Biodiversity was valued using patent rights to estimate potential value of undiscovered plant-based drugs for the pharmaceutical industry. As Cameroon is one of the top endemic species countries in the world (Butler, 2008; Duveiller *et al.*, 2008), a conservative price of 75% of Mendlesohn & Balik's (1997) average value of 3 US\$/hectare was used, that is 2.25 US\$/hectare. (Cardoso De Mendonca *et al.*, 2003, Mendlesohn &

Balik 1997, Ruitenbeek 1989). Fankhauser (1994)'s estimated global average carbon price of 20 US\$/ton was used to calculate carbon storage values (Minh Ha 2009, Yaron 2002, Van't Veld 2002). Soil fertility was valued through the replacement costs option. This was done by estimating nutrient loss following slash and burn clearing of forests in West Africa and defining the amount of simple N-P-K fertilizer is need to compensate for the soil fertility decline. The price for the local fertilizer brand Plantorus of N-P-K (20-10-10) was of 3000 CFAF⁴ per kilogram (Mainville *et al.* 2006, Rhodes 1988, Bush and Oosterveer 2007). Fertility loss was only evaluated in COVIMOF as GID Doh did not identify it as an issue for the community.

Field work was conducted between June and July 2009. A two-stage sampling strategy was used to create a sampling frame in which clusters or hamlets within the community were first selected and from which respectively 10 and 13% of the community's households were subsequently randomly selected. The number of households selected in each cluster was proportional to the cluster's population compared to the whole community. The SMP and the 1987 population census guided the sampling. In GIC Doh, questionnaires were conducted with 10% of the 253 households located in three hamlets, and one group discussion per hamlet. In COVIMOF, 13% 215 households in six of the eight villages constituting the community were interviewed, and two group interviews conducted: with women in Melombo and men in Akomnyada II.

Resource limitations meant that the methodologies used pose certain limitations. The indirect-use valuations technique used to value biodiversity and soil fertility lead to high uncertainty in the estimation of ecosystem services. Future studies using a longer time scale with primary data collection from observation rather than respondent recall are needed. A more randomised method for CF, household and discussion group selection would also increase methodological robustness.

Data analysis

For a Cost Benefit Analysis (CBA), key variables, costs and prices were extracted from the fieldwork and literature. Projections were made for each community to reflect two scenarios:

Scenario 1 – With CF: This reflects current, actual use of forest resources. This does not necessarily equate with activities described in the SMP, as a CF may have adjusted activities to gain higher returns in a shorter term than the prescribed five years.

Scenario 2 – Without CF: To compare with Scenario 1, a 'business as usual' projection of communities' activities without the CF was modelled, based on their description of resources used according to de facto rights and past habits.

² Groupe d'Initiative Commune: a common, legalised form of small collectively owned and managed enterprise in Cameroon under the Cooperative Societies and Joint Initiative Groups (COOP-GIC) Act (Law No. 92/006 of 14 August 1992), the Economic Interest Groupings (GIE) Act (Law No. 93/015 of 22 December 1993), and Associations Acts of 1990.

³ Direct translation: Community of the villages of Melombo, Okekat and Faekel.

⁴ Exchange rate at June 2009 1US\$ = 456 CFAF.

The data collected was extrapolated to the whole communities respectively. A distinction is made between financial and economic CBA. Financial analysis includes market priced costs and returns from activities, while the economic analysis also includes non marketed returns (i.e. household consumption) and opportunity costs of activities which impact ecosystem services. As the management convention allows communities to use forest resources for a fixed duration of 25 years; the analysis uses a 25 year period, taking into account the past years of exploitation extrapolated until the project reaches 25 years. It was assumed that this right would continue as communities renewed their SMP every five years. For GIC Doh, this equates to a 22 year extrapolation, while for COVIMOF 20 years. The OECD recommend a discount rate of between 3 and 4% for economic analysis of environmental projects (OCDE, 1995), previous analyses of CFs in Cameroon have used a 5% discount rate (Lescuyer 2000, Akoa 2007) and according to the CIA World Factbook (Central Intelligence Agency 2009) the Cameroon central bank discount rate was 4.75% in 2008. To reflect an appropriate time scale and enable comparisons, a 5% discount rate was used. A sensitivity analysis explored how positive and negative 20% changes in the parameters of operating costs, returns and annual harvestable timber volume affected revenue and cost outcomes for the communities. Variations from changing discount rates to 3%, 10% and 30% were tested as well.

RESULTS

GIC Doh

GIC Doh is located in the Eastern region, 25 km from Bertoua and contains 3 villages with a total population of 253 households, spread along 30 km of a minor linear non asphalted road, at least one of which has been located there since 1800. The CF covers 4 738 hectares, divided into a primary forest exploitation zone (2 961 ha) and agricultural zone along the road between the villages (1 777 ha). The SMP limits agriculture to the agricultural zone and excludes timber exploitation there. The main village activities are agriculture, hunting, fishing and NTFP harvesting: fuelwood, bushmeat, and plants such as njangsang (*Ricinodendron heulelotii*), bush mango

(*Irvingia gabonensis*), bush pepper (*Piper guineense*), snails, caterpillars and various medicinal leaves for medicinal purposes. An increasing number of people are involved in timber harvesting. Before the CF, three independent timber companies worked the area and villages practiced artisanal exploitation. The community forest was set up in 2006 by a small group with a background in timber and forestry, with the consensus of the population and financing from the three independent operators. External support was received from Project RIGC, who pre-financed five chainsaws. The management entity is composed of representatives of each of the 9 family lineages in the community elected annually at the general assembly at which all the population is convened. The entity's revenues from CF activities are used to support community projects such as improving inhabitants' dwellings, constructing a health centre and communal market.

From 2006 to 2009, timber was harvested by independent operators on behalf of the community, which provided all labour in the first three years. In 2009, the community started harvesting timber themselves, selling the majority to two of the initial three independent operators. Individuals also harvest timber from their own plots, often in collaboration with small chainsaw operators. Agriculture and NTFPs however represent by far the largest revenue sources in the community per hectare, also in Scenario 1 (Table 1).

Both scenarios show relatively similar results for a 25 year period, although the 'Without CF Scenario' is slightly more financially viable, while in economic terms, the 'With CF' Scenario is slightly more profitable. Comparing total harvested volumes of timber, forest use in Scenario 2 is highly unsustainable (Table 2). In the long term, scenario 2 becomes unprofitable with steeply declining returns after 19 years, once the ten popular species are depleted, leaving a low standing volume. Despite lower annual incomes, the more regulated option Scenario 1 provides constant returns up to and beyond the 25 period, due to a more sustainable management regime.

The sensitivity analysis indicates that at a 30% discount rate, economic and financial values are higher in Scenario 1 than in Scenario 2 (Table 3). The general preference within the villages is for a higher discount rate, due to the lack of alternative incomes and need for immediate financial returns. Scenario 1 is therefore more appropriate in the short run for

TABLE 1 GIC Doh's financial and economic returns at NPV at 5% per hectare (CFAF/ha)

Activities	Scenario 1		Scenario 2	
	Financial	Economic	Financial	Economic
Management	-6 673	-6 673		
Timber exploitation	82 283	82 283	21 524	21 524
Agricultural Activities	1 696 098	2 258 393	1 810,049	2 410 122
NTFP Harvesting	256 358	399 549	231 860	359 062
Biodiversity Value		-104		-629
Carbon Release		-47 729		-168 853
Total (CFAF/ha)	22 028 066	2 685 719	2 063 433	2 621 226

TABLE 2 Total harvested volume of timber after 25 years in GIC Doh (m3)

	Scenario 1	Scenario 2
Harvested volume m3	31 305	228 418
Unauthorized harvested volume m3	0	0
Total harvested volume	31 305	228 418
Standing Volume after 25 years	233 828	36 715
Total Revenues at NPV at 5% (CFAF)	389 856 289	101 982 040
Average Revenues per m3	12 454	446
Revenues per Hectare at NPV at 5% (CFAF/ha)	82 283	21 524

the communities. At a low discount rate, the scenario without a CF is still financially more viable than scenario 1, but the gap between returns closes, suggesting the financial advantages of scenario 2 will be lower towards the end of the CFs lifetime.

COVIMOF

COVIMOF is located in Nyong and So'o Department in the Centre region. It comprises 8 villages with 1 148 people in 115 households. South of the CF is a primary asphalted road joining Mbalmayo to Sangmélina, crossing the village of Okekat. The other villages are deeper in the forest, linked by dirt roads, making communication difficult due to the scattered spatial arrangement and swampy area. The main activities are agriculture (subsistence crops including cocoyam, cassava, peanut, plantain and vegetables with some households cultivating coffee and cocoa cash crops), and NTFP harvesting, with the majority of villagers not involved in the CF and timber harvesting activities. The vegetation is mostly secondary forest, some primary forest and a marshy area nearby the Nyong River. Exhaustive timber harvesting has taken place since 1981 and prior to the CF by private companies. Illegal harvesting was common and is still practiced despite the CF.

COVIMOF was one of the earliest CFs, established in 2004, the legal entity having been set up by elites in 1996 with the goal of sustainably managing the forest resources and socio-economic development. The management entity is composed of 10 non-elected members and 8 village delegates, and manages revenues from timber exploitation towards community projects such as the construction of wells, a primary school and a health centre. Initially it relied on an independent

company to fell its timber. However the CF's permitted volume of timber was exceeded in 2006, resulting in the loss of its permit and timber royalties in 2006, when one of its partner companies, ECAM-Placage, was caught illegally harvesting timber within the CF. However the legal case against it was dropped due to a lack of finances. In 2007, the CF reopened with the help of the Yaoundé-based NGO, the Centre for Environment and development (CED) and partnered with the civil society EQUIFOR to harvest and sell timber. Greenpeace and the Departmental delegation of MinFoF were also partners in reforesting degraded areas of the CF in 2007 and 2008. Conflicts and a lack of consensus concerning finances between COVIMOF and EQUIFOR ended the partnership in August 2008. The main source of financial revenues in the community (78%) is from agriculture and NTFP harvesting (19%) (Table 4).

While Scenario 1 is more profitable economically, Scenario 2 is also financially viable. The differences are however small, around 1%. Higher returns in the "Without a CF scenario" arise from increased use and conversion of the forest for agricultural activities, which is however undermined by the long term costs of losing ecosystem services. As forest products (fuelwood, bushmeat, and NTFPs such as bush mango (*Irvingia gabonensis*), palm nuts (*Elaeis guineensis*), raffia (*Raphia* spp.) and bitter kola (*Garcinia kola*) are the second most important source of revenues and for household consumption, economic returns need to be given a greater importance than just the commercialized share of production. The loss of soil fertility represents 15% of the agricultural activities in each scenario. An increase such loss of soil fertility rate could have multiple, negative effects on the profitability of agriculture in the future. Scenario 1 "With a CF" therefore appears the most beneficial scenario due to the

TABLE 3 GIC Doh's total returns per ha under alternative discount rates (CFAF/ha)

Scenarios		Discount Rates			
		5%	3%	10%	30%
Scenario 1	Financial (CFAF/ha)	2 028 066	2 522 686	1 285 133	449 433
	Economic (CFAF/ha)	2 685 719	3 322 298	1 695 483	601 291
Scenario 2	Financial (CFAF/ha)	2 278 403	2 597 179	1 274 082	423 739
	Economic (CFAF/ha)	2 621 226	3 292 486	1 630 204	558 447

TABLE 4 COVIMOF's financial and economic returns at NPV at 5% per hectare (CFAF/ha)

Activities	Scenario 1		Scenario 2	
	Financial	Economic	Financial	Economic
Management	-6 421	-6 421		
Timber exploitation	18 083	18 083	6 954	6 954
Agricultural Activities	394 200	882 041	410 434	920 878
NTFP Harvesting	97 664	134 513	86 785	119 416
Biodiversity Loss		-289		-521
Carbon Release		-75 830		-138 576
Soil Fertility Loss		-135 579		-149 019
Total (CFAF/ha)	503 525	816 518	504 173	759 131

lower environmental costs and higher overall economic returns.

COVIMOF has tried different exploitation modes, most not providing the returns expected. Factors affecting timber revenues include annual harvesting rates, the total harvestable area and market trends. Table 5 shows that Scenario 1 maintains long term timber volumes and is more profitable, providing almost four times more returns. The sharp contrast can be explained by the fact that GIC Doh does not traditionally exploit timber, therefore without a CF resources are entirely harvested by outsiders and only a minimum (labour costs) is paid to members of the community for its timber.

Table 6 illustrates how Scenario 1 remains the most profitable option economically at any discount rate. Yet, returns in the "Without CF" option remain almost the same as for "With a CF" and financially profitable under any rate. This can be

explained by the lower economic benefits from agriculture and NTFPs, due to land and forest degradation.

Comparison of the two community forests

The cost benefit analysis illustrates that in both cases the Scenario "With a CF" is the most profitable. GIC Doh produces higher returns both financially and economically than COVIMOF (Table 7), gaining greater benefits from each activity with correspondingly lower costs, except for the management expenses of running the CF. GIC Doh achieves four times greater returns from timber exploitation than COVIMOF, as despite the volume of timber being twice as great in GIC Doh, on average a 53% higher average price per m³ was anticipated, partly due to the losses incurred by the continued illegal logging in COVIMOF CF. This is attributed

TABLE 5 Total harvested volume of timber after 25 years in COVIMOF (m3)

	Scenario 1	Scenario 2
Harvested volume m3	10 794	51 857
Unauthorized harvested volume m3	4 661	112 355
Total harvested volume m3	15 455	164 212
Standing Volume after 25 years	178 277	29 519
Total Revenues at NPV at 5% (CFAF)	90 414 009	34 767 948
Average Revenues per m3	8 377	670
Revenues per Hectare at NPV at 5% (CFAF/ha)	18 083	6 954

TABLE 6 COVIMOF's total returns per ha under alternative discount rates (CFAF/ha)

Scenarios		Discount Rates			
		5%	3%	10%	30%
Scenario 1	Financial (CFAF/ha)	503 525	610 256	294 783	94 478
	Economic (CFAF/ha)	816 518	985 319	456 165	130 003
Scenario 2	Financial (CFAF/ha)	504 173	610 212	294 896	95 546
	Economic (CFAF/ha)	759 131	910 641	420 713	120 630

due to members with experience in the sector. However the major difference in revenues is from agricultural activities, with GIC Doh again having 60% higher economic revenues mostly because of high fertility loss and forest degradation in COVIMOF. NTFP harvesting also generates more than twice the return in GIC Doh than in COVIMOF. The costs of degrading ecosystem services in COVIMOF are double those of GIC Doh. While agriculture was planned to be limited in the first SMP, there is still no zoning or limit to agricultural expansion and on average 87 hectares are newly cultivated annually and the decrease expected in agricultural yields linked to forest degradation and declining soil fertility. Whilst this may be tempered by sustainable management; a low but constant annual rate of 1% decrease in yield is anticipated.

The distribution of costs and benefits provides another indicator of the impact of CFs on livelihoods. The stakeholders involved and assessed included independent operators and NGOs, the CF management institutions and the community. The local community represents also in a theoretical sense the global community that can benefit from ecosystem services. Comparing the distribution between the communities (Table 8), although both management entities received significant external subventions, COVIMOF received more external support. Detailed data on costs and gains by external organizations was unfortunately unavailable. These external stakeholders made a theoretical loss as they incurred relative costs, but had no direct returns. However in practice, their support was covered by grants which covered intervention and indirect costs (salaries and per diems for NGO staff and consultants). User groups (i.e. farmers, hunters, NTFP harvesters, villagers) in both CFs receive the highest returns under both scenarios, although in the GIC Doh the returns are three times higher than COVIMOF. Households in GIC Doh's

communities benefited from 10,502 CFAF/ha on average while COVIMOF communities received average returns of 6,999 CFAF/ha. Benefits in both cases indicate revenues used for communal projects.

DISCUSSION

The analysis indicates that despite differences in scale, both community forests provide more benefits for their communities, than a 'no CF' situation, in terms of economic returns and sustainability. However, there are sharp differences between the two communities and a very small gap in revenues between scenario 1 and 2 for COVIMOF. This raises questions about the conditional factors influencing the benefits of CFs. This is given that both are operating in broadly similar ecological, regulatory and institutional regimes. Intrinsic factors influencing the development, viability and impact of community forests are of course situational specific (Brown, 1999; Brown, 2002). While such factors justify the numerous studies documenting the CF process, it also points to the necessity of addressing these aspects in terms of priority vectors for action and impact and drawing lessons from the differences and similarities between the two cases. This paper identifies lessons learned from the case studies and from the literature review to determine which issues need to be addressed for the implementation and regulation of CFs in Cameroon.

Potential for vertical integration

GIC Doh has higher total benefits than COVIMOF, with timber receipts almost quadruple and agricultural and NTFP

TABLE 7 GIC Doh and COVIMOF's financial and economic returns over 25 years (NPV at 5% per hectare)

Activities	GIC Doh		COVIMOF	
	Financial	Economic	Financial	Economic
Management	-6 673	-6 673	-6 421	-6 421
Timber exploitation	82 283	82 283	18 083	18 083
Agricultural Activities	1 696 098	2 258 393	394 200	882 041
NTFP Harvesting	256 358	399 549	97 664	134 513
Biodiversity Loss		-104		-289
Carbon Release		-47 729		-75 830
Soil Fertility Loss				-135 579
Total (CFAF/ha)	2 028 066	2 685 719	503 525	816 518

TABLE 8 Distribution of costs and benefits from scenario 1 and 2 (CFAF/ha at 5% NPV)

	Scenario 1			Scenario 2		
	External organization	CF entity	User Groups	External organization	CF entity	User Groups
GIC Doh	-2 961	31 937	2 657 177	0	0	2 621 226
COVIMOF	-4 007	15 669	804 856	0	0	757 740

revenues double. Support has been underlined as critical in increasing such returns, both in Cameroon and worldwide (Vabi 2002, Fomete *et al.* 2001, Donovan *et al.* 2006, Macqueen, Macqueen *et al.* 2009). The case studies however point to different key determinants than the long history of external support that COVIMOF received. The managerial and technical skills of the communities, allowing them to fully vertically integrate their production, appear critical in capturing and adding value and assuring higher returns from timber.

GIC Doh has evolved its CF management, initiating community exploitation only after three years. While receiving financial support in the first phase, the community provided only paid labour initially. Adequate management of these revenues allowed them to initiate self-managed exploitation in 2009, with plans to phase out all external operators. This strategy has resulted in a significant increase in returns — up to 20 times greater — than relying solely on partnerships, a phenomenon also noted in other situations (Ezzine de Blas *et al.* 2008).

A contrasting situation affected COVIMOF's lower profitability. Their lack of technical and managerial expertise led them to depend upon external partners at all stages of exploitation, in a complex situation dominated by poor governance and corruption. The lack of representation in COVIMOF's management institution further suggests the wider community neither participated in resource use decision-making nor benefited from exploitation revenues. Initially, COVIMOF's reliance on fraudulent independent operators drained social, natural and financial capital, and did not result in any employment. At the commercialization stage, COVIMOF's failed commercial partnership meant that felled timber was never sold, again incurring a net loss. The 2008 annual report of the local MINFOF official emphasizes that the "difficulty to sell timber and non-timber products is a crucial problem encountered by four of six CFs" in Nyong & So'o Department (DDFOF 2009, Vabi 2002, Ezzine de Blas *et al.* 2008). Research, and increasingly also development literature, has underlined that a value chain approach focusing on marketing capacities is critical for viable small forest enterprises (Scherr, White, and Kaimowitz 2003, SNV 2009, Plouvier and Atyi 2000). This approach has not been highlighted by Cameroonian NGOs (Abbe, Tchoumba, and Beaud 2006) until recently. The cases also illustrate that support actors had little more technical or marketing expertise than the CFs.

GIC Doh received external financial support in the first and second stage. Since COVIMOF already had a good financial basis, the level of financial support is a decisive factor. This is iterated as a common barrier in Cameroon (Djeumo 2001, Adeleke 2006, SNV 2005). The significant NGO support for COVIMOF highlights that rather than the value of support received, the definitive factor in economic and financial productivity is the technical and managerial capacities within the community. NGO support to help develop these competences to a level where they communities can valorise their timber (and potentially, non-timber products) and manage a value chain to maximise benefits, appears a pivotal factor. The cases indicate that NGO support is only beneficial

if it allows the community to participate in higher value, profitable operations. It can be detrimental and costly if insufficient, creating dependency and being vulnerable to abuse. In Cameroon, external assistance in the sector almost exclusively refers to NGOs or consultancies, many of which are well established in the CF business.

Access to resources

Total costs vary noticeably between communities. Higher costs incurred by COVIMOF are largely due to the costs of degrading ecosystem services, but the occurrence and distribution of management costs, whilst less than 3% of total costs are also important with influencing factors best explained by the access and use of natural, infrastructural and information/legal resources available to each community.

Natural resource base

The positive relationship between high returns and access to abundant forest resources has been highlighted in Cameroon and other tropical forested areas (Sunderlin *et al.* 2005, Ezzine de Blas *et al.* 2008, Cuny *et al.* 2007). Higher environmental costs of COVIMOF's past timber exploitation are exacerbated by the high rate of un-demarcated and unplanned land use change. Small-holder agricultural expansion is one of the main causes of deforestation in this case, as in Cameroon in general (Grieg-Gran 2006). Fertility loss in COVIMOF was attributed in interviews to this forest degradation, linked to the heavy exploitation history and aggravated by large scale illegal exploitation. Uncontrolled development can aggravate competition for space by comparing the longer term revenues from timber against the immediate benefits from agriculture (Brown 2002). GIC Doh in contrast, has a defined agricultural area that minimises the expansion of smallholder agriculture. Therefore not only access to natural resources, but also resource and land planning is an important aspect in CF profitability and a major determinant of agricultural productivity.

Access to finance and infrastructure

Other costs, often camouflaged, are the fixed and functioning management costs. Overall they are relatively similar for GIC Doh and COVIMOF, but the underlying distribution and composition of these costs highlights factors key to profitability. Both CFs required financial support during their development stages. In GIC Doh, financing covered 50% of first and second stage costs in creating the CF. COVIMOF used individual capital to cover these expenses. The total value of external aid received over CF's predicted lifetime shows that over two thirds of COVIMOF's management costs in exploitation were absorbed by supporting organizations. These organisations also largely subsist on grants and projects, making this an expensive (and un-transparent) investment. COVIMOF's slow phases of exploitation have now been halted by the lack of finances to open new sites, as current support partnerships have resulted in heavier debts than benefits (B. Owonondi, Pers. Comm., July 16, 2009; DDFOF 2009). Access to financial resources, at either stage of development, is thus essential to long term CF

profitability. Cameroon however has some of the poorest indicators worldwide for doing business (World Bank 2009), creating a very un-enabling environment for small forest enterprises, lacking financial support or collateral available (Kozak 2009, Brown, 2002, Donovan *et al.* 2006). Financial institutions are unwilling to commit to this largely informal, small scale sector with a reputation of corruption (Laird *et al.* 2010, Awono, Ndoye and Preece 2010). These cases illustrate that instead financial support was provided by intermediary NGOs, who are arguably unqualified to provide effective and neutral advice. The net present value analysis demonstrates the insignificance of overall management costs, relative to other returns in GIC Doh, proving that these costs can easily be absorbed once exploitation has started after access to financial resources.

Access to information and legal resources

Small-scale and unauthorized timber exploitation in COVIMOF incurred high environmental, monitoring and enforcement costs, during which no financial benefits were received. Global Forest Watch (2000) emphasizes the high number of violations in Central region, Nyong & So'o ranking as the second highest for infringements and that "one fifth of all violation reports registered are not fully followed through in the judicial process because of the "intervention of an influential person" (GFW 2000: 34). COVIMOF's failure to act against its partners' fraud has had severe impacts on its viability. The lack of transparency and corruption in governmental and community processes coupled with the CF's political weakness against powerful actors, due both to their lack of awareness of rights, access to legal and information resources, silenced them into inaction, in common with other poor, forest dependent communities (Sunderlin *et al.* 2005, Brown 2001, Oberndorf *et al.* 2007). The lack of information on law and procedures is aggravated by the communities' dependence on authorities to help, also common in other areas of Cameroon (Brown 2002). COVIMOF demonstrates how access to information and legal resources can be decisive in the viability of CF and its capacity to positively impact livelihoods.

Regulatory drawbacks

When examined closely, the roots of many conditional factors can be found in the current legislation. A review of these weaknesses allows a prioritisation of issues, which, at the time of the fieldwork, was fed into a joint government, FAO and SNV lead consultations to amend the 1994 Forestry Law.

Establishing a framework for sustainability

A major drawback of the 1994/01 Law is its failure to promote sustainable management of forest resources. This originates from the conceptual incompatibility between the law and the assumption that CFs can enhance sustainable management, as CFs can only be located in the non-permanent forest domain, where forests can be converted to other uses and where timber exploitation is concentrated. This has two negative effects. Firstly, CFs are often secondary forests previously exploited, reducing their capacity to

provide meaningful livelihoods through timber, as COVIMOF's case underlines (Mandondo 2003). Secondly, CFs find themselves competing with commercial companies, which have less restrictive exploitation rules and often try to access CF resources through exploitation arrangements (Brown 2002). The facilitated exploitation and subsequent rush to gain short-term benefits increases the risk of unsustainable harvesting in the short term and the overall sustainability of the CF as a long-term enterprise (Ezzine de Blas *et al.* 2008).

This problem is enhanced by the lack of experience (only 5% of CFs are recorded as having revised or starting revising their SMPs for the second five year cycle (Ministry of Forestry and Wildlife 2010) in renewing the CF convention. The short five year time horizon of the contract, based on one-rotation cycle of 25 years, reinforces to a profit maximization focus within the first management convention, as access is not assured after this period, aggravating the predicament of sustainable CFs.

Including of other income generating activities

The 2003 MoP and its revised 2009 version (Ministry of Forestry and Wildlife 2009) and encapsulating 1994/01 Law implicitly emphasise timber exploitation as the means to provide returns from CFs (Brown 2002, Cuny *et al.* 2006). This negates other forest products and services which play a more dominant role in CFs, particularly in the montane and savannah areas and provides an inadequate framework for implementation. Evidence from the case studies located in the humid forest zone points to the greater income generated and comparable importance of agricultural and non-timber products, mirroring previous studies documenting the long term benefits that can be derived from their active management (Brown *et al.* 2001). The focus on timber to support the high costs of CF is encouraged at the detriment of other, often more traditionally important and more sustainably manageable forest resources (Brown 2002). The cases show that agricultural expansion, the mainstay of these rural economies, competes with timber exploitation if not managed and planned. Negating the importance of NTFPs and services creates a false dichotomy between forestry and other land uses, especially agriculture, despite the numerous interface links shared by all activities (Mandondo 2003).

Ecological sustainability and diversification of livelihoods could be maintained by promoting the integration of other opportunities into the CF more explicitly: NTFPs and agriculture, but also reforestation, tourism, conservation (Cuny *et al.* 2007) and emerging in the last year, payments for reduced or avoided deforestation and degradation, in the form of Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) mechanisms. Including other income generating opportunities such as payments for ecosystem services could not only allow CF projects to become more sustainable, but more profitable while increasing the populations' livelihood resilience through diversification. Cameroon's legislation still needs to take into account multiple sectoral uses of forest and land resources and reduce its focus on timber exploitation. To date, 14 applications for

CFs (2% of the total) have been rejected due to conflicting land uses of which the communities were presumably not aware when they started the attribution process. By integrating other land uses, leaving room for possible schemes paying for ecosystem services in the process, and reinforcing the concept of sustainable community land planning and management.

Increasing the rights of communities

The decentralization aims in Cameroon's CF regulatory framework are a major source its shortcomings in implementation (Etoungou 2003, Oyono 2005, Oyono, Biyong, and Kombo 2009, Poissonnet and Lescuyer 2005). The disconnect between command-and-control national policies and majority interests highlights that the framework is not responsive and accountable to citizen views, and that participation, representation, and other forms of inclusion are neither common practice or effective (Gregersen and Contreras 2010, Veit *et al.* 2009), negatively impacting community empowerment and natural resource governance. The case studies echo these criticisms and highlight the lack of community power when faced with injustice and the absence of sufficient safeguards and mechanisms when competing for the forest resources (legally or illegally). The impact is to impoverish the community. This is due to the lack of definition, accountability and representation of to these populations in the existing law, facilitating abuse at all stages in the CF process.

The definition of "community" both in the law and in the 2009 MoP remains insufficient, leaving an arbitrary gap in identifying who needs to be included in the CF process. While grievance procedures allow those believing they are excluded to exercise their voice, such a right on its own is inadequate unless complemented by strategies to effectively know about, claim and defend such a right against the powerful array of actors in Cameroon's forests (DFID 2001). There is no established right of public redress for citizens against state agents, and very little power to counter excesses of the forest industry (Brown 2002), as our case studies demonstrate.

The current regulatory framework does not confer any guarantee of representation or accountability from the forest management entity to its population, failing to guarantee equal benefit-sharing and integration of the community in the process (Brown 2002). A double edged sword is that as the law does not recognize traditional institutions as legal entities, this opens the way for elite capture through the creation of an extraneous body managing the CF (Tacconi 2007, Brown, 1999). However, it also creates a path for new political and familial power structures and allegiances, as the cases show. While traditional institutions are not always accountable to their populations, the value knowledge and resource intensive nature of CFs creates a window of opportunity for abuse by authorities or elites, in the absence of checks and balances (Brown *et al.* 2001). The cases highlight the need to strengthen communities' rights by defining the concept of "community" and enforcing mechanisms to guarantee equitable representation.

The fact that of the CF management entities benefited in both cases whilst user groups maintain similar benefits, indicates that the CF model offers a higher value and more benefits touching a greater number of people in the community, than the situation without a CF. Compared with past experience, illegal logging benefited a smaller but not quantified number of people, largely external to the community. The difficulty in obtaining data on profits obtained by supporting NGOs, timber companies and the government however is a drawback in accurately assessing distributional equity. The sample size does not sufficiently permit an analysis of issues of equity within the community between different user groups (hunters, NTFP gatherers, farmers) or for specific groups such as women and elites. However during the focus groups there was no indication given of changes in perceptions in equity between users after the creation of the CF.

Strengthening Tenure Rights

Another drawback of the Forestry Law is its failure to permanently award exclusive use or ownership rights for CFs. This lack of decentralisation and devolution emphasizes that only conditional communities empowerment occurs, failing to address fundamental issues of ownership, control of the forest and the land on which they grow (Mandondo 2003). The transfer of tenure rights may be an essential step in sustainable resources management (Brown 2002), noted by with CF initiatives in other countries, noticeably Mexico (Bray *et al.* 2006). This argument however is nuanced, with evidence suggesting that classic tenure rights are not de facto a guarantee of sustainable management and that what counts is local level empowerment and institution-building, particularly building on local structures rather than creating new ones, and a flexibility that reflects dynamic overlapping customary and regulatory frameworks on the basis of current political, social and market contexts (Gregersen and Contreras 2010).

POLICY RECOMMENDATIONS

The networks and organizations involved in sustainable forest management not only in Cameroon but worldwide since the early 1990s have produced a wealth of studies documenting the process. They could be expected to provide sufficient evidence to improve practices; however the gap between science, policy and practice remains problematic (Gough and Elbourne 2002, Colfer 2005, Ojha 2006, Larson and Ribot 2007). This results in a lack of overview of the economic and social impact of CF regionally in Central Africa and in Cameroon in particular, given similarities between the situations. Institutional and organizational reform — with a participative revision of the Forestry Law planned. Corresponding improvements in intervention methods and instruments are necessary to further sustainable development and improve livelihoods. Given the scope of this study, recommendations for further amendments include:

- Provision of a clear definition of “community” to allow local populations to develop appropriate representation and accountability and through legitimate and accountable institutions.
- Take into account traditional institutions, customary land uses and tenure to provide safeguards against external abuse and elite capture, also to ensure equitable benefit sharing and informed community planning (Fomete *et al.* 2001, Adeleke 2006).
- Incorporate other income-generating activities and environmental services in the CF framework to promote diversified livelihood strategies.
- Provide monitoring and quality control guidelines for CFs in exploitation to ensure equal benefit-sharing and transparency (Fomete *et al.* 2001, SNV/FGF 2006).
- Stimulate professional finance and credit systems that enable communities to fund their CF independently of technical partnerships and develop transparent financial transfer mechanisms for community benefit distribution (Brown 2002). Coordination between all actors involved is essential to efficiently channel funds for lasting impacts.

CONCLUSION

This study provided a snapshot of community forests in Cameroon based on an economic, financial and environmental assessment of two communities. These have resulted in net benefits that enhance rural livelihoods and sustainable management of natural resources, compared to a situation without a community forest. However, the profitability and distribution of benefits is highly conditional upon a number of factors, particularly the technical and managerial capacities of communities, access to and the quality of natural resources, access to finance and legal resources. Co-option by community elites, private logging companies and government agencies further hinders the success of CFs and prevents the representative and equitable distribution of benefits. External support can enhance these factors, but does not directly correlate with positive outcomes.

An analysis of the case studies, empirical and secondary evidence indicates that the 1994 Cameroon Forestry Law, currently in the process of revision, contains conceptual and legislative weaknesses that translate into practical hurdles that either hinder or positively contradict the aim for devolution and sustainable management of forests. The rights and responsibilities of local communities are currently insufficient to guarantee a significant level of improved livelihood from community forestry. The incomplete decentralization process fails to empower rural populations due to its inconsistencies, lack of representation and transparency. Legislative and institutional reforms therefore continue to be needed to increase the positive impact of CFs on livelihoods. Whilst recommendations and studies exist for reforming forestry and land tenure in Cameroon, the valuation of ecosystem services has not been included and needs to be incorporated to take into account the multidimensional nature of rural livelihoods

and the opportunity costs in developing different land uses. Future research could address distributional equity within communities, options for enhanced local governance and land tenure reforms with more precise methodologies. Time is an important dimension to allow decentralization and devolution to become institutionalized and validate the impacts of CF in operation. Greater cooperation and exchange of information is required to accelerate the process to realize the full potential of the community forestry approach.

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