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Forests and Climate Change: adaptation and mitigation

EUROPEAN TROPICAL FOREST RESEARCH NETWORK



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4.1 Adaptation for forests and communities in the Congo Basin

DENIS SONWA, YOUSOUFA BELE, OLUFUNSO SOMORIN, CYPRAIN JUM and JOHNSON NKEM

Introduction

Climate change is considered to be one of the major threats to sustainable development because of its impacts on health, infrastructure, settlements, agriculture and food security, and forest ecosystems. An increasing frequency of extreme events such as increased temperatures, drought conditions and intermittent floods are expected to stretch natural systems. Climate change constitutes an additional burden on top of poverty, disease, illiteracy, weak institutional capacity, war, unstable political governments, poor infrastructure and other global environmental change issues (such as land-use change, land degradation, desertification and biodiversity loss), which limit development in Sub-Saharan Africa and countries in the region from realizing major global targets such as the Millennium Development Goals (MDGs).

In recent years, a number of global assessment reports, such as the Millennium Ecosystem Assessment 2005, the Stern Review 2007 and the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 2007) have all emphasized the vulnerability of Sub-Saharan Africa to climate change impacts and the region's inability to cope with projected climate change scenarios. Numerous factors underscore the vulnerability of the region to climate change impacts. One notable aspect is that the livelihoods of the poor majority (especially women and children) are highly dependent on climate-sensitive sectors such as agriculture, fisheries, pastoral practices. Local people also depend on forests for household energy, food security, water supply, herbs and tree bark as the first line of primary healthcare. These livelihood activities also contribute a significant proportion of the gross domestic product (GDP) of countries in the region. This reveals the fragility of national development to climate uncertainties,



THE CHALLENGE FOR THE CoFCCA PROJECT WAS TO INCREASE BOTH PUBLIC AND POLICY-MAKER AWARENESS OF FORESTS' CONTRIBUTION TO THE DEVELOPMENT OF LIVELIHOOD ADAPTATION STRATEGIES AND TO USE FOREST GOODS AND SERVICES IN A WAY THAT DOES NOT JEOPARDIZE THEIR RESILIENCE TO FUTURE CLIMATE IMPACTS.

Denis Sonwa, **Youssoufa Bele** and **Cyprain Jum** are with the Center for International Forestry Research (CIFOR), Central African Regional Office, Yaoundé, Cameroon; **Olufunso Somorin** is with CIFOR Yaoundé and the Forest and Nature Conservation Policy Group, Wageningen University, the Netherlands; and **Johnson Nkem** is with the Center for International Forestry Research (CIFOR), Bogor, Indonesia.

and the unpredictability of successfully implementing sustainable national and economic development plans.

The negative effects of climate change are likely to have the worst impacts on the poor. Most of them live in developing countries, and in Sub-Saharan Africa most of them are women and children. Women — who are likely to be hit hard by climate change — already shoulder the burden of providing household livelihoods, and are among those most vulnerable to climate variability and change, particularly as they are highly dependent on natural resources. Household livelihoods and food security are also likely to be vulnerable under the changing climate since both production systems and forests, which are a vitally important part of food security in the region, are intricately dependent on the climate system. This makes it imperative for climate change and climate variability measures to be taken seriously and for adaptation to be integrated into project development planning in both the private and public sectors in Sub-Saharan Africa.

Unfortunately, the importance of forests in the Congo Basin region — besides timber export value — is under-represented in some major national development planning processes, such as those on climate change response and poverty reduction strategies. This could largely be due to inadequate capacity in using the available evidence that documents how forests sustain the poor. The challenge for the Congo Basin Forest and Climate Change Adaptation (CoFCCA) project was to increase both public and policy-maker awareness of the contribution of forests to the development of livelihood adaptation strategies and to use forests goods and services in a way that does not jeopardize the resilience of the forests to future climate impacts. This would ensure the continuous provision of these goods and services, which contribute to adaptation, improving food security and reducing poverty.

Forests and Central African communities

Congo Basin forests constitute the second largest rainforest after the Amazon; its interconnected tropical forest represents 18 percent of the remaining global tropical rainforest (Anonymous 2007). The Congo Basin forests also hold 70 percent of the total plant cover in the African continent. Six Central African nations share the 1.5 million square miles of the Congo Basin forests: Gabon (17.7 percent); the Republic of Congo (12.4 percent); Cameroon (11.8 percent), the Central African Republic (3.4 percent), Equatorial Guinea (1.3 percent); and, with more than 50 percent, the Democratic Republic of Congo (CBFP 2006).

The forest area per capita is 2.9 ha, compared to a global forest area per capita of 0.8 ha. More than 78 million people inhabit this region, 62 percent of whom still live in rural areas (FAO 2005). Despite the vastness of the area's natural resources and the riches of the Congo Basin forests — on which people depend for their everyday needs (Ndoye and Tieguhong 2004) — the level of poverty in the region is still very high (Tieguhong and Ndoye 2007). A significant majority of the local communities sustain their livelihoods by direct use of forest ecosystem goods and services for household consumption, including food, fuelwood and medicinal plants. They also generate income from the trade of many forest goods, especially non-timber forest products (NTFPs).

In addition to supporting local communities the Congo Basin forests also contribute to the national economies of the countries that share them, especially through timber exports. In 2004, 49.4 million ha (36 percent) of the forest was under logging concessions (Karsenty 2005). The logging sector contributes 10–15 percent of regional GDP and is a major source of government revenue, foreign exchange and employment (Collomb 2003). It contributes up to 18 percent of GDP of the Central African Republic (CAR) (Demarquez and Petrucci 2005), and about 20 percent of the foreign exchange earnings of Cameroon (MINFOF 2005). The development of the Congo Basin region cannot be successful without the sustainable management of its vast forest resources.

Adaptation for forests and people

The Congo Basin forest also provides major regulatory services for local and regional weather and ensures the cycling of water, which is a critical resource for adaptation and is also projected to be severely affected by future climate change (Anonymous 2007).

As well as the wildlife habitats and biodiversity preserved in these forests, more than 29 million people, mostly indigenous people of about 150 distinct ethnicities, live in the Congo Basin forests (Anonymous 2007 and CBFP 2006). They are totally dependent on the forests for habitat and resources for livelihood, which further increases their vulnerability to climate change impacts. As an ecosystem providing livelihood opportunities (e.g. water, household energy, foods and medicines) for such a large number of people living in extreme poverty, the forest remains an indispensable asset for supporting poverty reduction strategies and serving as a starting point for adaptation. Unfortunately, the value of forests to local livelihoods is not fully captured in national development plans in the Central African region. In a review of some national documents, such as the first national communication reports submitted to the United Nations Framework Convention on Climate Change (UNFCCC), very few references were found to the potential contribution of forests to climate adaptation and mitigation strategies.

For decades, deforestation (through the conversion of forest lands to other land uses) has been the second major source of greenhouse gas (GHG) emissions, after fossil fuel combustion (IPCC 2007). There has been a global decline in deforestation; Sub-Saharan Africa is the only region where it has increased. Deforestation in the western and Central African region of the continent — including the Congo Basin forests —accounts for most of this loss of forests. The huge implication of this in terms of climate change is not just carbon emissions; more importantly, it is increasing the vulnerability of forest ecosystems.

Consequently, there is a need to study climate change impacts and their implications for indigenous and traditional communities in the Congo Basin Forests. It is also important to understand the adaptation strategies these people have developed over time, particularly in marginal areas and ecosystem boundaries. The natural resource base affected by climate change needs to be evaluated in order to plan for the special adaptation needs of women and the elderly, and of minorities and under-represented groups who are the most poor and most vulnerable.

Given this lack of data, planning climate change response becomes very challenging, but it is absolutely fundamental and urgently required. Planning national climate change adaptation involves the integration of scientific knowledge and monitoring, and estimating future scenarios in order to formulate policy (Nkem, Idinoba and Sendashonga 2008). The goal of the CoFCCA project was to provide an innovative framework that incorporates forest ecosystem goods and services from sustainably managed Congo Basin forests into climate change adaptation strategies. These strategies contribute to poverty reduction and biodiversity conservation in a way that enhances resilience to future climate impacts. For a region where livelihood and national development are highly linked to natural resources, an effective pro-poor approach for climate change adaptation is fundamental in sustainability and poverty alleviation (CoFCCA 2008).

The CoFCCA initiative

The Congo Basin Forests and Climate Change Adaptation (CoFCCA) is a three-year project of the Center for International Forestry Research (CIFOR). Based on CIFOR's previous research on dry landscapes in West Africa, the initiative was developed with the idea of learning from the Tropical Forest and Climate Change Adaptation (TroFCCA) project of the Center for International Forestry Research (CIFOR) and the Tropical Agricultural Research and Higher Education Center (CATIE) and using its approach to understand the vulnerabilities of the forests and the dependent communities of the Congo Basin to the multiple impacts of climate change, both present and future. The project covers three countries within the region (Figure 1): Cameroon, Central Africa Republic (CAR) and the Democratic Republic of Congo (DR Congo).

Figure 1.
Map of Congo Basin countries
(project countries are Cameroon, Central Africa Republic and Democratic Republic of Congo)



The project's main objective is to contribute to the development of policy-oriented adaptation strategies that also ensure the sustainable use of forest resources. This is to be done in the following ways:

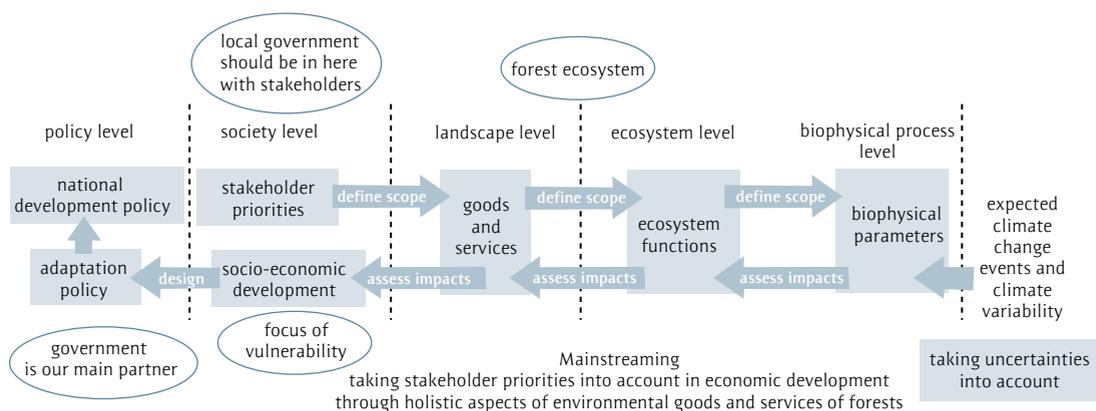
- identifying and prioritizing forest-based sectors through a regional science-policy dialogue;

- assessing the vulnerability of gender and minority groups including indigenous communities;
- developing adaptation strategies that emphasize the links between climate change, forest ecosystems and livelihoods, with the goal of mainstreaming them into national development policies; and
- contributing to capacity building for communities and technical staff.

Conceptual and analytical framework

The methodology was intended to link variables related to vulnerability (such as impacts, exposure, sensitivity and adaptive capacity) across different levels (policy, landscape, ecosystems and species), so that a streamlined assessment of vulnerability could be undertaken. It was expected that forest-based sectoral methodologies developed in the TroFCCA project could be adapted for use in the region, especially where sectors with similar priorities exist (Table 1). The methodology should be seen as a chain of events that start from the development policy and return to it while incorporating adaptation as a component of development (Figure 2).

Figure 2. Methodological framework approach of CoFCCA



Other sustainable livelihood approaches developed by CIFOR, including criteria and indicators for sustainable forest management, were used in the CoFCCA project. Starting with a national development policy, the project will assess the vulnerability of sectors and areas where forests play a significant role. After the assessment, the project would return to the national policy with a clear idea of how to incorporate adaptation. The methodology to assess the vulnerability of tropical forests to climate change will follow similar approaches, leading to a clear identification of adaptation priorities for the Congo Basin forests.

Preliminary results

In July 2007, CIFOR organized a brainstorming workshop around climate change adaptation and the Congo Basin forest. This workshop led to the implementation of the CoFCCA project. One of the main achievements of the project is creating an awareness of the forest and climate change adaptation debate within the region by emphasizing the role

of the Congo Basin forests in adapting to climate change impacts. The initial focus as far as climate change is concerned has been mitigation. In many regional policy debates and scientific literatures (for instance, the State of the Forest in Central Africa 2006), climate change adaptation is not an urgent priority.

Another key achievement involved developing baseline scenarios on climate change impacts, vulnerability and the adaptive capacity of the Congo Basin forest ecosystem. Several working groups (or task forces) were put into place within the project to study specific factors:

- the magnitude of climate change in the region;
- the impacts of climate change on forest ecosystems; and
- the effects of climate change on local communities and the communities' adaptive capacity.

Technical reports on the baseline situations are available and are being reviewed. A review of the climate change vulnerability of indigenous peoples in the Congo Basin reveals that their adaptive capacities are shaped by parameters such as accessibility to information, ability to acquire new skills and access to markets. During a kick-off meeting where several stakeholders involved in climate change and forest-related activities within the region were present, the science-policy dialogue led to the adoption of a number of forest-related sectors that are considered to be more sensitive and/or vulnerable to climate variability and change in the Congo Basin.

Sectors were prioritized at two levels, national and regional. The resulting priorities determined the research emphasis in developing adaptation strategies (Table 1). The sectors include bio-energy (wood fuel), NTFPs for food and medicinal purposes, and drinking water (CoFCCA 2008).

This analysis was pivotal in setting the stage for the rest of the project activities (CoFCCA Annual Report 2008). Other objectives are gradually building around these prioritized forest-related sectors. The results of the ranking process emphasized the importance of ecosystem provisioning services and demonstrate regional livelihood dependence on the forest for these ecosystem goods and services. The potential impact identified so far is the possible delineation of common areas of interest by several countries for collective adaptation action, with broad consequences that could be managed by a regional framework such as the Central African Forest Commission (COMIFAC).

A workshop was organized with the aim of using the Participatory Action Research (PAR) approach to evaluate the vulnerability of local forest-dependent communities and look for appropriate solutions in the Congo Basin to develop adaptation strategies at the local level. At this level, the target is to see how priorities resulting from the science-policy dialogue match communities' priorities. Contributing to capacity building, especially at the local level, is one of the objectives of the CoFCCA. Since uncertainties still remain as to the magnitude and direction of many climate change variables — such as degree of exposure, sensitivity, impacts, vulnerabilities, resilience and adaptive capacity — building local capacity and capability of students and researchers is critical. Within the project,

a number of graduate students and researchers were awarded fellowships to undertake vulnerability assessments in all the project countries. Some assessments are concentrated on landscape dynamics and modeling impact scenarios; others have focused on ecosystem goods and services, and their provisioning under a changing climate.

Table 1. Project priorities

DR Congo	Cameroon	CAR	Regional
food (NTFPs)	food (NTFPs)	agriculture and animal husbandry	food (NTFPs)
energy (firewood, charcoal)	water (potable, quality, quantity, availability, access)	water (potable)	water (potable, quality, quantity, availability, access)
water (potable)	research	biodiversity	energy (firewood, charcoal)
health (medicinal plants)	energy (firewood, charcoal)	health (medicinal plants)	health (medicinal plants)

Looking ahead

Incorporating climate change adaptation into forest policy (and vice-versa) in the Congo Basin requires information and scientific knowledge. From an epistemological viewpoint, this information will be central to mainstreaming adaptation into policy processes. At the regional level, the challenge for CoFCCA will be to identify constraints on and opportunities for climate change adaptation. Vulnerability maps of the prioritized forest-related sectors will be developed. PAR activities initiated at the local level focused mainly on the evaluation of tools for impact and vulnerability assessments, which involved knowledge sharing and learning opportunities for current and future adaptation strategies.

Results from the various research projects will be useful in shaping future climate change adaptation strategies at the local and national level. The project will provide capacity-related support by increasing collaboration with national universities and research institutes. This is particularly important for increasing the scientific knowledge and expertise of tropical forest ecosystems and climate change adaptation in national research priorities. A regional perspective on adaptation, based on a comparison of research findings from the different countries, will be integral to designing a regional political framework in which adaptation would be embedded. In addition, collaborating with an existing regional political institution such as COMIFAC should give more visibility to the outcomes of the project.

Conclusions

With the CoFCCA project, an awareness of forest ecosystems and climate change adaptation is gaining momentum in the Congo Basin. It is accepted that forest ecosystems and forest-dependent communities and their livelihoods are vulnerable to climate change. It is also understood that the vulnerability of forests will lead to the vulnerability of the

people who depend on the forest. Capacity-building is in force to expand the relevance of adaptation within the region. To date, the project has prioritized forest-related sectors and has started to develop methodologies to assess vulnerabilities. The next steps include developing vulnerability maps and adaptation strategies using forest resources. This implies a constant iterative science policy dialogue among stakeholders in the region.

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