

Forests for climate change adaptation in the congo basin

Responding to an urgent need with sustainable practices

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Key points

- Raising policy and public awareness on climate change and discussing the need for adaptation strategies.
- Harnessing the Congo Basin's carbon potential for sustainable economic growth, climate change mitigation, and improved local livelihoods.
- Reviewing emerging market opportunities and their limitations for equitable cash flows, goods and services provision and national development.
- Improving ecological safety nets in forests so that valued resources are more resilient to climate variability and change.
- Balancing the interests of multiple stakeholders when setting priorities intended to achieve the Millennium Development Goal's, national economic growth and sustainability objectives.
- Engaging public participation in a science-policy dialogue throughout the process.

An innovative framework is needed whereby goods and services from sustainably managed Congo Basin forests are integrated into climate change adaptation strategies. Such strategies should also contribute to poverty reduction and biodiversity conservation in a way that enhances the forests' ecological resilience to climate impacts. For a region where livelihoods and national development are closely linked to natural resources, choosing the best pro-poor pathway for climate change adaptation is fundamental to sustainability and poverty alleviation. An understanding of ecosystem services and their trajectories in future climate scenarios will be required. Participation by multiple stakeholders, including women and minority groups such as indigenous communities, is crucial to ensure their interests are reflected in national planning and policies. This information brief reiterates the opportunities for integrating poverty alleviation and climate change adaptation strategies into an ecosystem approach¹ to regional forest policy and management.

Carbon capital of the congo basin and climate change

An estimated 25-30 million tons of carbon stocks are locked in the vegetation in the Congo Basin forests (Hoare 2007) and more than twice as much in the soil and litter sinks. However, these forests are vulnerable to activities such as slash-and-burn farming, and logging, which release substantial carbon stocks and thus contribute to global climate change. On a global scale, agricultural and forestry activities are the second largest source of human-induced greenhouse gas emissions after burning fossil fuels.

Although the Congo Basin's overall annual CO₂ emissions are low, deforestation and degradation account for 90 per cent (20-60 million tons per year) of its emissions. Emerging evidence indicates that selective logging accounts for 25-50 per cent of the region's carbon losses (Hoare 2007), and also helps to open up new forest areas for activities such as slash-and-burn farming (Figure 1) that are likely to accelerate carbon and biodiversity losses. These secondary activities are estimated to release 2.5 times more carbon than from selective logging alone (Greenpeace 2007). These emissions not only undermine the global response to climate change, but also reduce the local capacity to adapt to climate change impacts.

For example, the Central African rainforest is naturally drier than the tropical rainforests of South America and South East Asia, and has become drier in recent decades (Malhi & Wright 2004). Projected temperature increases under climate change are likely to accelerate this trend, severely damaging the forest ecosystem and its capacity reliably to provide essential environmental services such as water supplies for local communities and power generation, and forest products that sustain local livelihoods.

The carbon capital locked in the forest biomass also plays a major role in water and other biogeochemical cycles with far-reaching consequences. The forests generate 75-95 per cent of regional rainfall through evaporation and evapotranspiration (WWF 2007), compared to 50 per cent in the Amazon Basin and <20 per cent in Asian forests. Evaporation from the basin contributes about 17 per cent of West Africa's rainfall (Eltahir *et al.* 2004). Deforestation will potentially cause

a decline in rainfall as far away as North America and Europe (Feddema *et al.* 2005), and decline in water quality and quantity in the Congo River which possesses 1/6th of the world's known potential for hydroelectric power (Maniatis 2007).

This interconnected expanse of tropical forest allows uninterrupted biological processes to distribute carbon across different sinks, and enhance the ecosystem's resilience to climate impacts. This vast reservoir of natural resources and environmental services also generates wealth (Katerere & Katerere 2005) and is crucial for local livelihoods. Therefore, maintaining the forest's biodiversity integrity and biological connectivity must be an essential element in climate change adaptation strategies. Financial mechanisms emerging through Reducing Emissions from Deforestation and Forest Degradation (REDD) schemes could generate crucial revenue to help the most deserving and needy people adapt to local climate change impacts.

Safeguarding regional safety nets for adaptation

Tropical forests are widely considered to be safety nets (Box 1) that provide subsistence goods and services to help people get through difficult times such as crop failures, illness, shortages in household energy supplies and reconstruction materials. Yet safeguards to protect the safety net itself are still not integrated into forest management planning. Safety nets are crucial mechanisms for climate change adaptation and constitute major drivers for reactive adaptation in natural resource-dependent communities.



Photo by Abdon Awono

Box 1. Forests as safety nets

Table 1. Forests safety net mechanisms as household livelihood coping strategies

Coping with adversities	Function	Description
Safety net	Insurance	Food and cash income in periods of unexpected food and income shortfalls
Support current consumption	Gap-filling	Regular and irregular food and income shortfall, such as crop failures and seasonal shortages
Occupational activities	Source of employment and for diversification	Unexpected job loss, off-cropping season activities such as artisan handicrafts

Source: Modified from Stern Review (2006)

Forests safety nets for household livelihood and national development fall into three critical function categories: insurance, gap-filling and alternative livelihood activities. All of these are major assets in responding to climate change. As a source of livelihood security, these functions need to be included in planning for poverty reduction (Scherr *et al.* 2004) and climate adaptation strategies, as well as forest management.

The Congo Basin forest is also highly strategic as a defense against advancing desertification in northern Africa and shielding water in the Congo River, which is shared by several countries, from the intense heat and accelerated evaporation resulting from climate change. The forests also play a strategically important role in regional, continental and global climate responses, regional development, and most importantly in livelihood security for the approximately 100 million people who depend on the forest, including about 30 million indigenous people (CBFP 2006).

Forests are commonly recognized for their role in mitigating the impact of the principal greenhouse gas, CO². Less well appreciated is their role in regulating extreme climate events such as floods, droughts, heat and dust storms, thereby providing a frontline buffer for people coping with climate change. As forests are a transboundary resource shared by several countries, there is the risk of conflict over diminishing resources due to climate change, at a time when increasing deforestation and degradation require a unifying

framework and a comprehensive adaptation strategy for forests across the entire Congo Basin. The safety net concept is a different approach to managing forests in a climate change future, requiring synergies between mitigation and adaptation processes.

Managing contemporary issues and emerging opportunities for adaptation

Climate change is a contemporary challenge of the Congo Basin (Box 2), requiring strategic planning to harness whatever emerging opportunities might exist for adaptation. The carbon stocks stored in the forest biomass and soils represent economic and livelihood opportunities for household and national development that could be strategically harnessed as part of the global effort on greenhouse gas emissions. Opportunities include rewards for avoided deforestation in areas vulnerable to activities such as slash-and-burn farming.

Economic activities in the Congo Basin have rapidly expanded beyond the timber trade in recent decades following significant surges in the commercial importance of non-timber forest products. These upswings have created new, largely unregulated economic networks that link remote regions with major urban and global consumer markets (DRC-PRSP 2007). The booming trade in both timber and non-timber forest products threatens the integrity of the very forest ecosystem that provides these goods (Debroux, *et al.* 2007) and undermines its resilience to climate change. This in turn undermines the capacity for local communities to adapt to climate change impacts.



Photo by Daniel Tiveau

Box 2. Some changes in terrestrial systems due to climate change impacts

- Phenology: changes in the timing of many life cycle events, such as blooming, migration and insect emergence
- Species distributions and abundances: Shift in plant and animal ranges
- Climate-linked extinctions and invasions
- Changes in morphology and reproduction of organisms
- Species community changes and ecosystem processes: decoupling of species interactions
- (e.g. predator-prey relationships)

Source: IPCC Fourth Assessment Report 2007

The trade is driven by emerging markets with new opportunities, especially in China, and the need for postwar reconstruction in the Democratic Republic of Congo. On the other hand, new economic opportunities are emerging through the United Nations Framework Convention for Climate Change (UNFCCC) 13th Conference of Parties decision to create an incentive scheme to reduce emissions from deforestation and degradation. This decision paved the way for experimentation with rewards for avoided deforestation projects in three locations, including the Congo Basin forest.

These emerging opportunities will only be translated into local and national development benefits through participatory approaches that lock in and balance the multiple interests of all stakeholders and actors in the region. Reforms will also be required in the laws and institutions that define flows and access rights, shape the markets and lay down regulatory mechanisms including benefit sharing as well as sustainable forest management and conservation.

The regional challenge now lies in choosing between alternative development pathways. On the one hand, exploitative development and livelihood activities will deliver benefits in the short-term but ultimately undermine ecological and therefore local human resilience to climate change, and the capacity for adaptation to its impacts. On the other hand, adaptive sustainable development policies will ensure forests will continue to provide a buffer against climate change impacts while providing livelihood opportunities and safety nets for local communities.

Contribution to development priorities

The United Nations Millennium Development Goals (MDGs) defined universal milestones for morally acceptable human development. These goals are unlikely to be realized in sub-Saharan Africa by the 2015 timeline (United Nations Economic Commission for Africa 2008, UNDP & UNICEF 2002). There are

several reasons for this lag. Amazingly, the potential contribution of forests to achieving some of the MDGs is not reflected in the national plans of actions. Yet forest resources drive national economies and sustain the regional livelihoods of the very poverty-stricken communities targeted for the MDGs. Excluding forests from plans of action omits a critical entry point for connecting with the target group.

Sustainable economic growth requires the national economic base to be expanded by facilitating broad participation and alternative livelihood opportunities (Scherr *et al.* 2004) that help to reduce poverty. Forests are an ecosystem surrounded by different asset pools that fit into the sustainable livelihood framework, and as such, forests have a central role in setting development priorities. Therefore, including forest management in the planning for climate change adaptation will contribute to the resilience of national development in the face of future climate change impacts.

The ecosystem approach also presents participatory opportunities for integrating human and environmental aspects into strategies to address key development challenges (Box 3). In terrestrial biological systems, special conservation measures are also needed



Photo by Colince Menel

Box 3 CIFOR initiative on climate change and forest

CIFOR's approach is to create an environment for climate change adaptation whereby stakeholders and partners are brought together to set the agenda and the implementation plan of activities that reflect local livelihood and national development priorities. With support from the International Development Research Centre Climate Change Adaptation for Africa program, CIFOR's "Congo Basin Forests and Climate Change Adaptation" project is undertaking research in the Congo Basin forest with the vision of generating public awareness and developing a critical mass for planning adaptation strategies, as well as contributing to the knowledge base required in using forest ecosystem services for climate change adaptation, and mainstreaming this into national development. Working with multiple stakeholders in a participatory action approach, the project balances the multiple interests of the stakeholders and identifies their special needs for adaptation.

as part of the adaptation effort, focusing on spatial strategies, such as ecological networks, short-term refugia, robust corridors, transnational pathways, or potential future protected areas.

Conclusion

While the "safety net" roles of forests are critical to the livelihoods of millions of rural poor, they also play an important role in the national economy by maintaining market routes and networks for a large part of the population engaged in marketing forest products. There is great, unrecognized potential for climate change adaptation as well as poverty reduction through using these markets more effectively to generate revenue and diversify livelihood activities.

Targeted actions by national and international policymakers, local producer organizations, the forest business community, and civil society and donor organizations is required to harness market trends towards the development of sustainable local livelihood systems. Regional institutional pathways such as the Central African Forest Commission (COMIFAC) provide an important platform for an ecosystem approach in responding to climate change and achieving synergy between mitigation and adaptation strategies. Policies that protect the weak and vulnerable while balancing multiple interests and activities contributing to human wellbeing and national development should be emphasized.

Reference

¹Ecosystem approach (IPCC 2007). The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. An ecosystem approach is based on applying appropriate scientific methodologies focused on levels of biological organisation, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of many

ecosystems. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Priority targets are conservation of *biodiversity* and of the ecosystem structure and functioning, in order to maintain ecosystem services.

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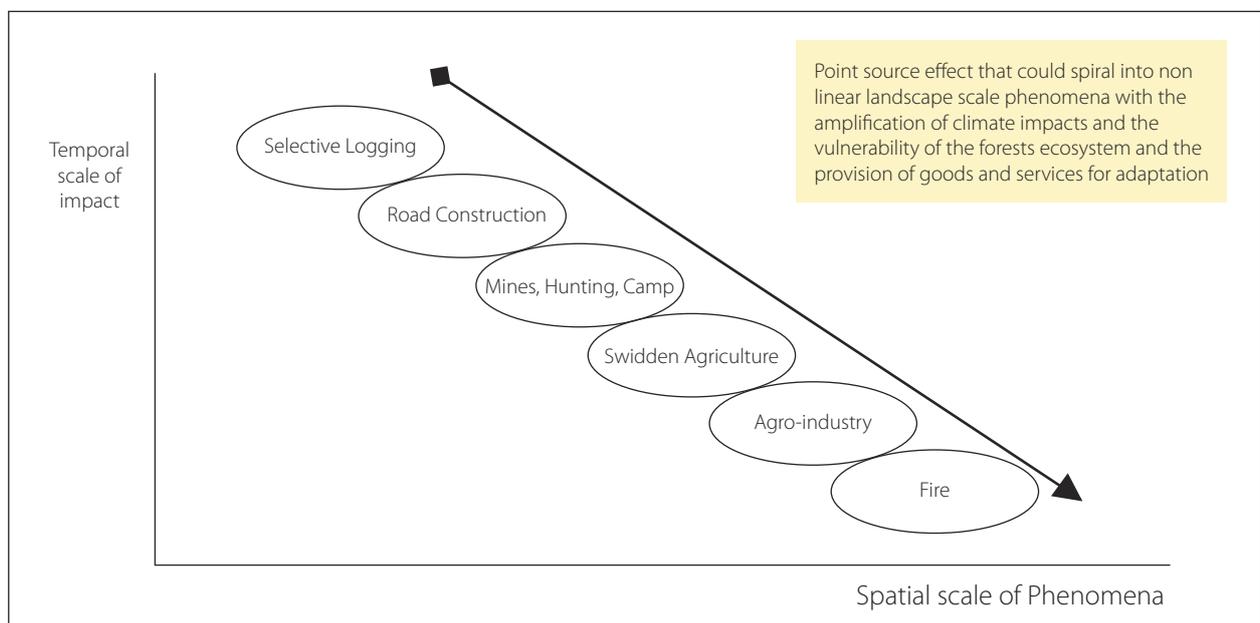


Figure 1. The potential amplification of anthropogenic disturbances over time and space in the Congo Basin Forests

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