REDD+ and adaptation to climate change

Key message

There are potential synergies between REDD+ and adaptation but strategies to exploit these synergies are at an early stage of development. Further work is needed to better understand how REDD+ can reduce human and ecosystem vulnerability at different scales and how links between adaptation plans and REDD+ plans can be made in practice.

Disclaimer

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1 **Some forest ecosystems are more vulnerable to climate change than others.** The resilience of a forest ecosystem to changing environmental conditions is determined by their biological and ecological resources, such as the diversity of species, the regional pool of species and ecosystems, and the size of forest ecosystems (generally the larger and less fragmented, the better).
Different types of forests might be particularly vulnerable or serve particular functions. For example:

- Tropical cloud forests are especially sensitive because they are in areas with steep gradients and highly specific climatic conditions.
- Tropical dry forests are particularly vulnerable to changes in rainfall, increased fires, land degradation and latitudinal shifts in habitats.
- Coastal wetlands, including mangroves can reduce vulnerability to sea level rise and extreme weather events whilst also contributing to food security. Restoration of degraded mangroves in the Mekong Delta in Vietnam for example, has improved management of coastal forests, improved coastal protection and safeguarded important nursery grounds for local fisheries and food security[1].

Modelling studies suggest that forest conservation, particularly at the basin scale in the Amazon, could be important for preventing climate feedbacks that could cause more rapid forest loss through the acceleration of climate change[2].

2 **REDD+ can contribute to forest adaptation.** Conserving forests, reducing human pressures on forests, preserving genetic and species diversity, and enhancing landscape connectivity are some examples of objectives for forest adaptation. REDD+ can contribute to these objectives, but it may not be sufficient. Specific measures may need to be planned into REDD+ programmes to reduce vulnerability to future climate change.

3 **REDD+ could contribute to human adaptation to climate change at different scales through its support to ecosystem services.** REDD+ aims to conserve the global ecosystem service of carbon sequestration and may contribute to conserving other services (e.g. water regulation, provision of goods).

At the national scale, REDD+ could contribute to human adaptation through:

- Increased resilience in highly vulnerable sectors, such as hydropower and drinking water, which are particularly dependent on forest goods and services.
- Increasing the scale of national environmental planning processes from projects to programmes. For example, ecosystem-based adaptation activities are often more accessible to the rural poor and can better support poverty

reduction objectives.

At the local scale, ecosystem services can act as safety nets to reduce vulnerability of forest dependent communities to climate shocks and stresses. These could include, for example:

- Non-timber forest products (NTFPs), such as fuelwood, water, medicines. The livelihoods of 250 million to one billion people depend on these products[3].
- Environmental services such as clean water and erosion prevention.
- Income from the sale of timber, NTFPs or potentially carbon.

4 **REDD+ could have negative impacts on both ecosystem and human adaptation to climate change, depending on the types of policies and the rules established.** The main pathways include:

- **Policy approaches that reduce access to assets.** For example, policies such as strict enforcement of protected areas can restrict access to livelihood assets, which could increase vulnerability, particularly for forest dependent communities[4]. Agricultural intensification outside the forest estate as part of a REDD+ strategy could also degrade lands and increase vulnerability.
- **A focus on carbon could unbalance 'policy packages', resulting in less coherent and potentially less resilient forest protection plans.** Studies suggest that conservation and biodiversity priorities might not coincide with incentives based on carbon metrics. Incentives based on alternative metrics at the international level might be needed to ensure that REDD+ is implemented in conservation priority areas.
- **Different definitions of 'forest'[5] and activities such as 'sustainable forest management' could result in REDD+ approaches that are less resilient to climate change.**

5 **REDD+ and adaptation policies can complement each other:**

- Adaptation strategies such as 'ecosystem based adaptation'[6] aim to conserve ecosystem services to reduce human vulnerability, but can have positive impacts on carbon conservation.
- REDD+ could provide a source of funding to support human adaptation.
- REDD+ projects are more likely to be successful if they take into account the impacts of climate change on local livelihoods (i.e. populations affected by climate change may not buy into REDD+ projects and may need to deforest to cope with climate impacts).

In terms of national and subnational governance, there are also potential synergies between REDD+ and adaptation. Similar governance reforms or policy changes are needed for both. Existing evidence indicates that only 56% of 'National Adaptation Plans of Action' (NAPAs) have significant natural resource components[7], and in some countries REDD+ and adaptation strategies are being dealt with under separate processes (e.g. Nepal).

Key publications on this issue

Guariguata, M., Jonathan, P., Locatelli, B., Forner, C., Sanghez-Azofeifa, G. (2008) 'Mitigation needs adaptation: Tropical forestry and climate change', Mitigation and Adaptation Strategies for Global Change, Vol. 13, No. 8.

IUFRO (2009) 'Adaptation of forests and people to climate change: A global assessment report', Ed. Seppala, R., Buck, A. and Katila, P.

Locatelli, B, Kanninen, M, Brockhaus, M, Colfer, C. J. P, Murdiyarso, D and Santuso, H (2008) 'Facing an uncertain future: How forests and people can adapt to climate change', CIFOR Forest Perspectives No. 5, CIFOR: Indonesia.

Nkem, J., Santoso, H., Muriyarso, D., Brokhaus, M. And Kanninen, M. (2007) Using tropical forest ecosystem goods and services for planning climate change adaptation with implications for food security and poverty reduction.

Reid, H., Phillips, J. And Heath, M. (2009) 'Natural resilience: healthy ecosystems as climate shock insurance', IIED Briefing Note, IIED, London, U.K.

Thompson, I, Mackey, B, McNulty, S., Mosseler, A. (2009) Forest Resilience, Biodiversity and Climate Change: A synthesis of the biodiversity/resilience/stability relationship in forest ecosystems. CBD report.

1 World Bank, 2008

2 Bruijnzeel (2004) for example, predicts that large-scale Amazonian forest conversion to pastureland would result in a 7% reduction in annual rainfall. Recent research on the Amazon also suggests that the river feeds carbon sequestration by diatoms in ocean, amounting for an additional 7.2 million tons of carbon sequestration each year due to nitrate and phosphate inputs delivered by the river's water. Subramaniam, A (2008) 'Amazon River enhances diazotrophy and carbon sequestration in the tropical North Atlantic Ocean', PNAS July 25, 2008. Bruijnzeel, L. A. (2004) 'Hydrological functions of tropical forests: not seeing the soil for the trees?', Agriculture, Ecosystems & Environment 104: 185-228.

3 Byron and Arnold 1999, cited in Locatelli et al. 2008

4 Brockhaus, M. and Botoni, E. 2009. Ecosystem services – local benefits, global impacts. Rural 21 Vol. 01/2009: 8-11

5 For example, in some circumstances plantations will be less resilient to climate change, and there are unresolved questions in the UNFCCC process surrounding the definitions of activities included in REDD+ and the safeguards surrounding the avoidance of conversion of natural forest.

6 Ecosystem-based adaptation (EbA) is the use of biodiversity and ecosystem services (through sustainable management, conservation and restoration) as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change.

7 Reid et al. 2009