Links between biodiversity and forest carbon

- Generally, strong correlation between forest carbon stock and biodiversity (e.g. Strassburg et al., 2010). Both are highest in primary forests

- However, important exceptions, and related opportunities to optimize biodiversity benefits at low cost (Venter et al., 2009), e.g. focus on areas with high levels of endemism – key opportunity for GEF and other biodiversity funding.

Links between biodiversity and forest carbon

- Carbon in plantations on average 28% lower than primary or other naturally regenerated forests (Liao et al., 2010)

- A/R generally inferior to natural succession for carbon sequestration and storage (with exceptions); factors leading to forest degradation need to be effectively controlled for A/R (Sayer et al., 2004; Liao et al., 2010)

Links between biodiversity and forest carbon

- Synthesis of 400+ peer-reviewed articles: Forest resilience and stability depend on biodiversity, at multiple scales (Thompson et al., 2009, see also Diaz et al., 2009)

- Implications e.g. for REDD permanence: biodiversity essential for stability/carbon permanence

- **Biodiversity is enabling condition for SFM and REDD-plus**
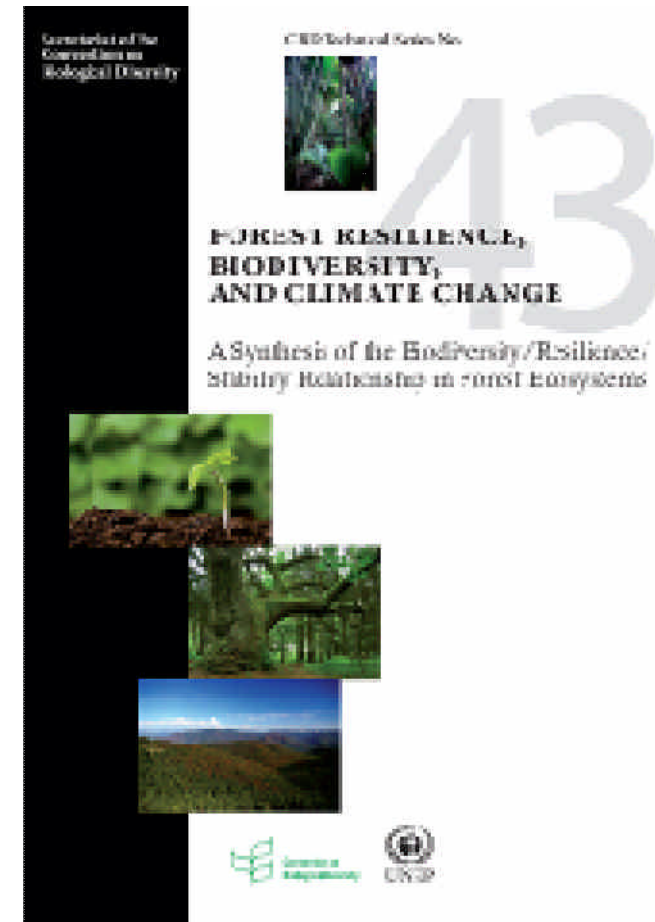
Forest Resilience and Biodiversity: Key Findings

- **Primary forests and other naturally regenerated forests are generally more resilient** (and stable, resistant, and adaptive) than planted forests.

- Biodiversity (at species, genetic and ecosystem level) supports **maintain forest ecosystem resilience** and thus the long-term stability of the forest carbon stock.

- Increasing the biodiversity in **planted and semi-natural forests** will have a positive effect on their resilience capacity and often on their productivity (including carbon storage).

Key Knowledge Gaps

– **Monitoring of SFM/REDD-plus biodiversity benefits**, including in the context of forest degradation/restoration: simple yet robust criteria and indicators (work ongoing)

– **Biodiversity and ecosystem service data and models** including for online (interactive) 'on-the-fly' assessments

– **Economic aspects**: quantify the return on investment of multiple benefits/synergies, including ES

– Refining and/or operationalizing the **definitions** of certain terms (forest degradation ; classification of forest types)