

Scenario building—based on models that allow a quantitative analysis of the effects of different policy interventions on biodiversity—can be used both to inform policy responses and to communicate the challenges for achieving the 2010 Biodiversity Target and the longer term goal of halting biodiversity loss.

Scenarios were developed to evaluate six global policy interventions that were considered realistic, yet challenging, and for which long-term benefits for biodiversity were anticipated. The six policy options were:

1. The effective implementation of **full trade liberalization in agriculture** beginning in 2015, in line with the Doha Development Round of the World Trade Organization;
2. Direct investments in Sub-Saharan Africa, as well as trade liberalization in agriculture (option 1), to **alleviate extreme poverty**, in line with the proposals of the Millennium Project;
3. Implementation of a **climate change mitigation policy** option focusing on bio-energy, aimed at limiting climate change to within a global average temperature rise of 2 degrees Celsius;
4. **Sustainable wood production** based on plantation forestry, aimed at limiting the exploitation of timber from natural and semi-natural forests;
5. Implementation of **sustainable meat production** practices, taking into account human health, animal welfare, and limiting nutrient loading, involving higher costs and reduced demand for meat;
6. **Doubling the area of all terrestrial biomes under protected areas.**

The above policy options complement the more general storylines of the four scenarios examined in the Millennium Ecosystem Assessment (see Figure 4.4). Each of the six options was analysed individually for its impact on species abundance and ecosystem extent in terrestrial ecosystems, against a baseline of a moderate business-as-usual scenario in which biodiversity continues to decline driven by the combination of increasing global population and economic activity.

Full trade liberalization in agriculture (option 1) leads to losses of biodiversity additional to those occurring in the baseline scenario, because of expansion of land used for agriculture, particularly in Southern Africa and Latin America. These negative effects on biodiversity are accentuated in the poverty alleviation option (option 2), though longer-term benefits for biodiversity may result from the expected reductions in demographic pressure and economic improvements. Options 3 and 4 lead to medium-term additional reductions in biodiversity, but later improvements are expected due to reduced climate change and pressure on natural forests, respectively. Sustainable meat production (option 5) leads to marginal improvements in biodiversity compared to the baseline scenario. Doubling of protected areas (option 6) leads to a significant, but still small, improvement.

These findings suggest the need to identify smart, nationally and locally tailored combinations of measures for reducing biodiversity loss, using a range of approaches. The study concludes that:

- ◆ It is of paramount importance to minimize the rate of land conversion. The further enhancement of agricultural productivity is a key factor in reducing the need for land. Payment for environmental services that compensate for the opportunity cost of the non-conversion of biodiversity-rich natural ecosystems could also contribute to the 2010 target.
- ◆ Trade liberalization measures need to be combined with policy interventions to avoid unnecessary loss of biodiversity through land conversion in areas of low land and labour costs.
- ◆ A comprehensive and effectively managed network of protected areas is another important mechanism to limit the loss of biodiversity.

The study was carried out by the GLOBIO (Global Methodology for Mapping Human Impacts on the Biosphere) Consortium comprising the Global Resource Information Database of UNEP (UNEP/GRID-Arendal), the World Conservation Monitoring Centre (UNEP-WCMC), the Netherlands Environmental Assessment Agency (MNP) and the Agricultural Economics Research Institute at the Wageningen University and Research Centre (WUR-LEI).