



ECOSYSTEM-BASED ADAPTATION: USING ECOSYSTEM SERVICES FOR ADAPTATION TO CLIMATE CHANGE

The concept of ecosystem-based adaptation (EbA) was first introduced into negotiations at the **14th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) in 2008**. It has since then become an increasingly important aspect of the international climate policy debate. EbA measures are often enshrined in adaptation strategies and National Adaptation Plans of Action (NAPAs). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) specifically promotes the approach through the International Climate Initiative (ICI).

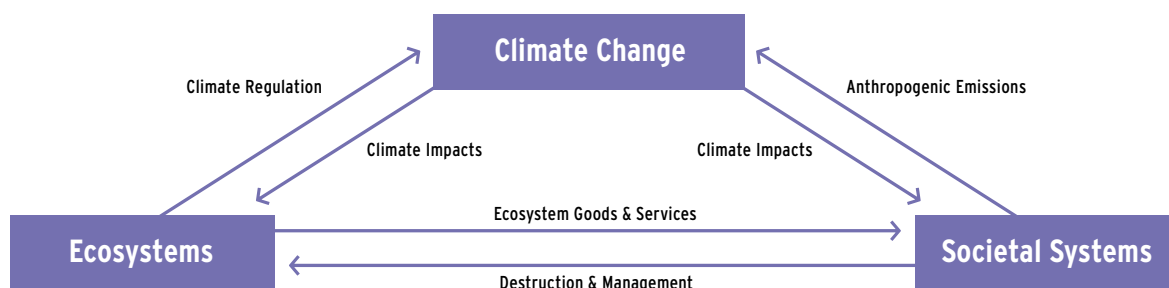
Functioning ecosystems provide important services for human society. For example, they conserve soil fertility, provide clean water and protect against floods and erosion. In the light of rapid world population growth these services are becoming ever more important, since **achieving the same ends by alternative technical means would be unaffordable. Poor people in developing countries are directly dependent on natural resources to a particularly large extent. By the end of the century climate change is likely to be the major cause of changes in ecosystem services** (Millennium Ecosystem Assessment 2005), **jeopardising many people's livelihoods**. At the same time functioning ecosystems help people and the natural world adapt to the effects of climate change. For example, wetlands, mangroves and beach ridges provide protection against storms and floods.

The concept of ecosystem-based adaptation

Ecosystem-based adaptation or EbA was defined by the Convention on Biological Diversity (CBD) and non-governmental organisations as **increasing the adaptive capacity of the population through the sustainable use and conservation of ecosystems. EbA is thus an anthropocentric approach. It aims to increase human societies' resilience in the face of climate change by managing natural resources sustainably and using them purposefully. This approach treats natural resources as complementary to or as a substitute for infrastructure measures.**

In contrast to classical natural resource and biodiversity management approaches, EbA focuses on the analysis of complex issues and cause-and-effect relationships, particularly on the pressures generated by climate change. Thereby, it explicitly considers both present climate variability and future climatic changes. For example, it draws on studies of climate change impacts or integrated climate analyses that make use of climate scenarios and models. While classical development and nature conservation strategies can also yield positive ecological and socio-economic co-benefits for adaptation, the EbA approach focuses specifically on the adaptation benefits right from the planning phase.

Interactions between climate change, society and ecosystems



Source: Based on Kus et al. (2010) and Consortium for Atlantic Regional Assessments (2006).

Boosting adaptive capacity

The benefits of EbA are obvious: ensuring that people have secure access via ecosystems to water and other vital resources and moderating the effects of floods, fire and drought safeguards people's livelihoods, reduces vulnerability to the impacts of climate change and increases resilience to natural hazards. Ecosystem-based adaptation also makes an important contribution to food security and poverty reduction. It also yields co-benefits such as biodiversity conservation and carbon sequestration in terrestrial and aquatic ecosystems. EbA measures therefore always deliver (climate) results, irrespective of whether the anticipated climate impacts occur.

A significant advantage of EbA measures is their cost efficiency. Quantified cost/benefit studies show that within a short period the benefits of restored ecosystems significantly outweigh the costs of their rehabilitation. In addition, such measures are often demonstrably cheaper than infrastructure measures. For example, it has been found in Vietnam that planting and maintaining mangrove forests to act as breakwaters and protect the coast is significantly cheaper (costing 1.1 million US dollars for 12,000 hectares) than mechanical repair of wave-induced dyke erosion (costing 7.3 million US dollars annually) (The Economics of Ecosystems and Biodiversity, 2009).

Ecosystem-based adaptation in the ICI

EbA is one aspect of comprehensive national adaptation strategies and should also be incorporated into existing national planning processes such as land-use planning. Specific measures include, among others, improved management, conservation or restoration of

- mangroves and coral reefs, to protect coasts against floods, storms and the consequences of sea-level rise;
- forests, meadows and pastures that provide protection against soil erosion and landslides (caused in part by increased heavy rainfall) and have a regulatory function within the hydrological regime;

- wetlands, riverine landscapes or floodplains to control flooding in areas at risk of floods, thus responding to changing precipitation patterns; and
- vegetation, where during increased and intensified dry periods it functions as a windbreak to protect against erosion and counteracts desertification and dust pollution.

Even though the EbA concept of adaptation has not yet been incorporated directly into the negotiating documents within the UNFCCC process, the importance of eco-systems for global adaptation to climate change is recognised. The approach is being discussed both in the UNFCCC and the CBD, as well as in the wider international climate policy arena outside the negotiating processes.

In keeping with this, EbA is gaining importance in German climate cooperation. In the ICI EbA is one of the priority areas in the field of adaptation. On the one hand, BMU is supporting projects that serve to mainstream the EbA approach at political and strategic levels in the partner countries (e.g. in Cambodia, Laos, Thailand, Vietnam). On the other hand, ICI finances pilot measures that put EbA to the test in practice and in the context of different ecosystems (e.g. in Brazil, South Africa, Uganda, Nepal, Peru and the Philippines). The experience gained is conveyed by BMU into the international discussion processes in order to promote further development of this innovative approach and move it further to the forefront of climate negotiations.

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