



Ecosystem-based Adaptation (EbA)

A new approach to advance natural solutions for climate change adaptation across different sectors

Conceptual background

People worldwide depend on intact ecosystems and the services they provide, such as soil fertility, clean water and food. This is especially true for poor people in developing countries, whose livelihoods are closely linked to natural resources. Climate change is one of the major causes of changes and deterioration in ecosystem services and its impact will most likely increase in the future (Millennium Ecosystem Assessment 2005). At the same time, functioning ecosystems help people and the natural world adapt to climate change effects.

“Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change.”

CBD 2009

Ecosystem-based adaptation, or EbA, purposively uses ‘green infrastructure’ and ecosystem services to increase human societies’ resilience in the face of climate change. Hence, EbA is an anthropocentric approach concerned with the way ecosystems can help people adapt to both current climate variability and future climate change. The objective is always to reduce the vulnerability of people towards the effects of climate change. EbA comprises measures to conserve, restore or sustainably manage ecosystems and natural resources, and complements or even substitutes other adaptation measures, such as hard or ‘grey’ infrastructure measures. In addition, the ecosystem-based, natural solutions tend to generate valuable co-benefits, such as carbon sequestration, biodiversity conservation, or food production, and are often more cost efficient. 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).

A promising new approach – or old wine in new bottles?

In contrast to common natural resources and biodiversity management approaches, EbA purposefully assesses and selects measures in the context of an overall adaptation strategy. It a) draws on studies of climate change impacts or integrated climate analyses that make use of climate scenarios and models, b) analyzes cause-and-effect relationships and pressures generated by climate change, c) considers costs and effectiveness of different adaptation measures, and d) monitors their adaptation impact. Thus, while classical development and nature conservation projects can also lead to positive ecological and socioeconomic co-benefits for adaptation, EbA focuses on adaptation needs and benefits right from the beginning. It is however important to note that a substantial number of EbA projects have started out as traditional nature conservation or natural resource management projects, and have only after some time realized adaptation benefits.

From theory to practice

The EbA approach is new – also to GIZ. There is abundant experience with potential EbA measures but in most cases these measures were not taken in the context of an adaptation planning process.

Experiences of **potential EbA** measures include, among others, improved management, conservation or restoration of

- forests, wetlands and organic soils to provide their regulatory function within the hydrological regime in the context of water scarcity due to decreasing rainfall and longer dry spells;
- pastures, forests and meadows that protect communities from enhanced soil erosion, mud flows and landslides due to increasing heavy rainfall;
- coral reefs and mangroves for coastal protection in the context of increased storms and floods;



- vegetation, where during increased and intensified dry periods it protects against the consequences from enhanced desertification, such as dust pollution;
- riverine landscapes, wetlands or floodplains in flood prone areas and watersheds responding to increased heavy rainfall and rainfall frequency or volume.

Rather such measures can be classified as EbA or not, depends on the specific context: during the project design. The theory of change must outline how they increase the resilience of vulnerable people in the face of climate change impacts.

EbA can be taken in different vulnerable areas/sectors, e.g. water management, coastal protection, food security, disaster risk reduction, reduced inland flooding or landslides, health sector, among others. One example of a **concrete EbA** measure is the project on coastal protection through mangrove reforestation and sustainable management in the Soc Trang Province, Vietnam. Impacts of climate change in Vietnam include altered precipitation and run-off patterns, changes in temperature regimes and more intense and more frequent tropical cyclones. It will also aggravate current pressures on biodiversity, like land-conversion through forest clearing for shrimp farming, pollution of soil and water from aquaculture and the overuse of forest products by local communities. EbA measures include conservation (protection zones where logging and shrimp farming is prohibited, co-management schemes for mangrove management) and restoration of ecosystems (rehabilitation of degraded mangrove forests and afforestation), as well as sustainable management (integrated planning and management of coastal zones, fishing regulations and promotion of alternative income opportunities for local communities).

Many of the existing tools and approaches in the fields of climate change adaptation and biodiversity management are relevant for EbA, e.g. vulnerability assessments of

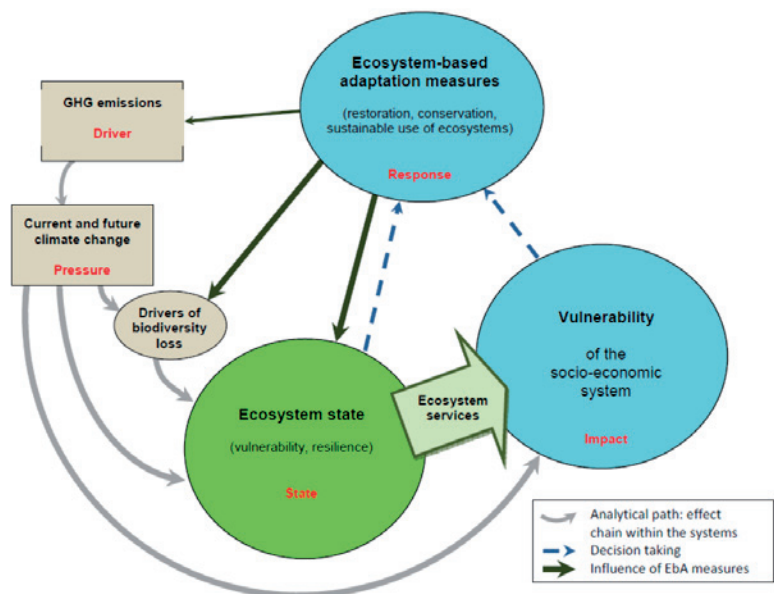
societies and ecosystems with respect to climate change, adaptation planning and monitoring, climate proofing, mapping and valuation of ecosystem services, spatial planning and ecosystem conservation/restoration.

Future outlook

EbA projects, components and pilot activities are on the rise within GIZ. GIZ Headquarters has established a working group involving staff from different sectoral departments to compile relevant experiences and tools, and to provide advice on how EbA can be advanced in German International Cooperation. Services that are under development and which can be provided on demand include:

- Provision of information material and training.
- Advice on specific methods/tools relevant in an EbA context.
- Design and implementation of pilot measures.
- Exchange visits and study tours to learn from good practices examples and experiences in Europe.
- Presentation of GIZ experiences in international fora.

Analytical framework for EbA measures



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