“Natural solutions to climate change:

The ABC of ecosystem-based adaptation

Summary and conclusions

from an International Expert Workshop
held 4-9 August 2013 on the Isle of Vilm, Germany

compiled by Barbara Fröde-Thierfelder, Isabel Renner and Klemens Riha

The seminar, jointly organized by BfN, GIZ and KfW, was aimed at clarifying basic principles of ecosystem-based approaches to climate change, specifically adaptation, as well as providing guidance to the implementation in the context of international cooperation. Supporting partner countries governments and institutions through advisory services for sustainable development, is the foremost task of German development cooperation. In August 2013, 42 experts from the fields of development cooperation and biodiversity conservation gathered at the International Academy for Nature Conservation Isle of Vilm, a branch office of the Federal Agency for Nature Conservation, to discuss constructive ways forward.

Further information can be downloaded at: http://www.bfn.de/0610_vortraege+M52087573ab0.html

1 OVERVIEW

A first introduction to the concept of ecosystem-based adaptation (EbA) as well as to the international policy field (see section 2) was followed by discussions along the adaptation cycle on entry points, objectives, vulnerability assessment tools, decision support tools for comparing adaptation options and approaches that allow the monitoring and evaluation of adaptation effects and changes in biodiversity. The expert inputs and interactive exercises where reflected in lively discussions and group work, linking participants' longstanding expertise in development planning with EbA (which was not seen as an entirely new but different topic and approach(see section 3). Although EbA has advanced conceptually, there is still work to do with respect to effectively moving EbA from principle to practise (section 4**Fehler! Verweisquelle konnte nicht gefunden werden.** gives indications on major practical questions discussed during the seminar).

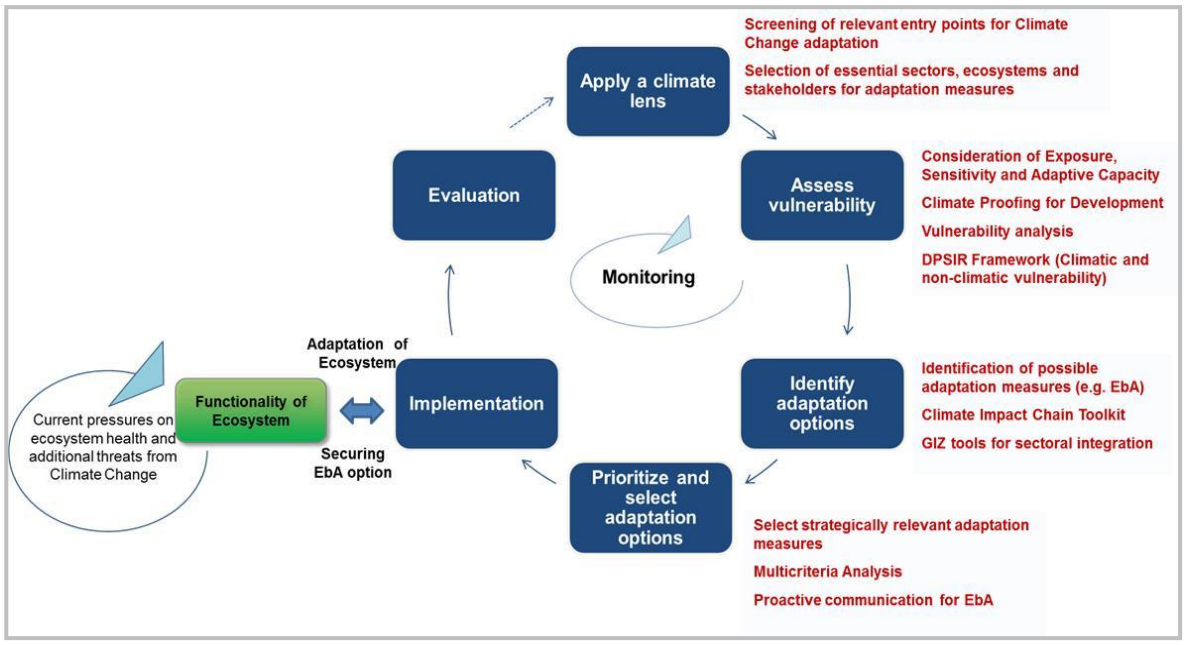


Figure 1: EbA and the adaptation cycle. Source: GIZ (2013)

2 WHAT IS EBA? AND WHY IS IT IMPORTANT TO KNOW ABOUT?

Ecosystem-based adaptation means using services provided by ecosystems to help people adapt to the effects of climate change**.** EbA depends on healthy ecosystems, and thus requires managing the ecosystems for their long-term benefits. Examples discussed during the seminar illustrate this interdependency:

- *Restoration and sustainable management of mangroves in **Vietnam's coastal areas** to prevent damage from storm surges due to increasing extreme weather events.*
- *Conservation of the **Páramo highland ecosystem in Ecuador** and its water storage service which offers continuous water supply for human consumption and irrigation downhill despite already increasingly erratic rainfall.*
- *Veld restoration in the **Arid Succulent Karoo, South Africa**, to decrease soil erosion and increase summer fodder availability as the area faces projected increases in drought.*

What is EbA?

"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. […] it aims to maintain and increase the resilience and reduce the vulnerability of ecosystems and people in the face of the adverse effects of climate change".

(CBD, 2009)

The concept of EbA is gaining attention and momentum. The international conventions reflect this: Originating from the CBD, the UNFCCC has discussed EbA since 2004, and included it into the Nairobi work programme on impacts, vulnerability and adaptation to climate change. In partner countries, ecosystem-based approaches become increasingly relevant within national adaptation strategies - project ideas and good examples are much sought after. Funding specifically for EbA is increasingly available, e.g. the German International Climate Initiative (ICI) financed by the Ministry for the Environment (BMU) explicitly funds EbA as one priority area.

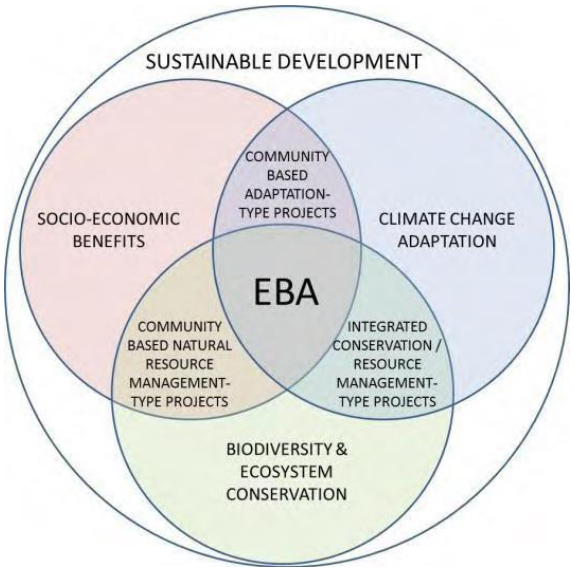


Figure 2: EbA at the intersection of concepts. Source: Midgley et al. 2012

EbA has many benefits. Many EbA-measures are considered "no regret"-options, making sense in terms of biodiversity conservation and development, offering multiple co-benefits, e.g. food security, mitigation of GHG, - independent of exact climate change adaptation. Compared to grey infrastructure, EbA measures can be very cost-efficient.

EbA is not new, but different. During the last years, an ever increasing body of evidence on EbA-measures and their impacts has been built up. Overlaps with existing concepts such as natural resource management, sustainable land management etc. (see Figure) become more tangible, fuelling discussions on the question whether a particular measure can be classified as Eba or not?

However, as EbA is (only) one part of the solution to a development challenge, such strict differentiation may not be necessary at implementation level. The seminar showed that EbA's structured approach along the adaptation cycle (see Figure), although not necessarily developing new measures, adds particular value by providing sound arguments for solutions with multiple co-benefits for communities and nature alike.

EbA requires cross-sectoral coordination. Many EbA-projects have originated as environment / biodiversity conservation efforts, while many beneficiaries – such as other sectors – have often not been even aware of the ecosystem services they rely upon and obtain from intact ecosystems. A BfN/ UNEP-WCMC study on EbA in Europe (2011) shows that existing projects classified as EbA mainly address water-related issues (river and coastal flooding). In German ICI's adaptation portfolio EbA can be found under the topics of land management, water, fisheries, disaster risk reduction and forests. This shows that EbA is ideally mainstreamed into sectoral strategies, in wise combination with other adaptation measures such as policy development, technical measures, infrastructure, capacity development and research.

3 CONCRETE STEPS FOR PLANNING AND IMPLEMENTING EBA

The seminar followed the steps of the adaptation cycle (see Figure 1), which helps thinking through the complex issue in a systematic way and avoids getting lost between causes and effects, problems and solutions. Project examples helped to grasp the added value of the structured approach, and gave experiences of available tools corresponding to each step.

Applying a "climate lens" in addition to the widely used "development lens" and "conservation lens" (see Figure), is useful to find **strategic entry points for taking up the discussion on EbA in political/ planning**

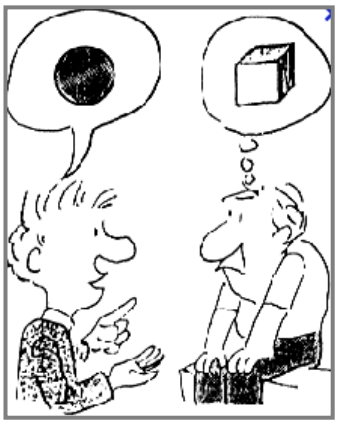
processes in the benefitting sectors. Windows of opportunity can be found at different levels: During the seminar participants learned about initiatives coming from coastal management in Vietnam where storm surges caused undeniable need for adaptation action; in Ecuador, a multi-level adaptation planning process is spearheaded by the environment departments while actually benefitting also the agriculture sector; and in Costa Rica, the nation-wide approach to marine and coastal biodiversity conservation has positive effects for future development, e.g. though sustainable fisheries yields.

Vulnerability assessments aim at clarifying and prioritising the need for action. They are a key element to successful climate change adaptation as they reveal vulnerabilities of systems, sectors, species, populations, entities, etc., depending on factors such as exposure, sensitivity, and adaptive capacity. With the increased recognition of the utility of vulnerability assessments, efforts to conduct these assessments are becoming more and more common and there is a growing number of tested methods and tools available, whose suitability depends on the adaptation goals as well as available resources in terms of data, time and money.

The MARISCO methodology (from the Spanish: Manejo Adaptativo de Riesgo y vulnerabilidad en Sitios de Conservación, which translates as 'adaptive MAnagement of RISk and vulnerability at COnservation sites') is an ecosystem-based approach to nature conservation and sustainable development that aims to integrate adaptive management, risk and vulnerability management for a more effective and risk-robust biodiversity conservation. MARISCO encourages planners and managers to actively deal with uncertainty and other forms of non-knowledge. Not only does it facilitate learning from mistakes and failure, but also increases the awareness regarding potentially dangerous *unrecognized* non-knowledge, the so-called blindspots. The example from Ecuador showed the usefulness of a participatory and inclusive approach as a visualised systematic process designed for collecting, structuring and documenting both knowledge and non-knowledge related to biodiversity, threats and drivers of change, as well as the (previous) conservation management for a given site, but also for developing an effective and risk-robust strategic portfolio.

A vulnerability analysis from Mexico showed how through communication between scientific and local stakeholders ecosystem based-adaptation could be translated into persuasive livelihoods benefits.

What EbA measures can look like could be learned from the BfN/ UNEP-WCMC study on EbA in Europe as well as from worldwide examples from Conservation International's portfolio. The examples showed that **EbA options can often be identified as sensible components of overall adaptation strategies**. However, the challenge remains to find arguments that can be used to **prioritise** EbA-options when grey infrastructure seems to be the obvious choice for stakeholders. **Economic valuation of ecosystem services** can help to demonstrate the multiple benefits of EbA measures and bring good arguments for communication and negotiation with different stakeholders. The example from Vietnam described how applying the "saved wealth saved health" approach, i.e. focusing on the total value of climate change adaptation projects with wealth and health benefits as quantitative indicators, resulted in EbA as a favourable option. The discussion showed that beyond factual arguments, targeted efforts are necessary to adequately communicate EbA and its benefits to counterparts. y.



EbA, as all adaptation, is a learning process, which requires adaptive management. In a(n) (EbA-) project, **monitoring during** the entire process and **evaluation** of results are crucial for keeping track and narrowing down future pathways. General questions are:

(1) Are we doing what we said we would do?

(2) Are we making any difference?

(3) Are the selected measures the right things to do and are they effective?

Only recently, concepts that guide M&E for adaptation start emerging. In the case of EbA, M&E is even trickier as the system under observation is very complex and difficult to reflect in a manageable theory of change. How to link project results to overall (national) adaptation success (reduced vulnerability, increased resilience) was lively debated. Some ideas on indicators defined by the seminar are listed below.

4 FROM THEORY TO PRACTISE: RECOMMENDATIONS AND OPEN QUESTIONS

During the seminar, the impression evolved that the international policy dialogue, the work of scientists and concept developers and practitioners' needs are still disconnected. At international level much effort is invested in developing methodologies and searching for finance, raising lots of expectations, whereas on field level EbA may also provoke the question "Is there anything new?" as measures often consist of well-known and established development approaches. There might be also tendencies to denominate approaches as 'ecosystem-based' although they are not sufficiently grounded on a *functional understanding of ecosystems*. Definitely, at strategic level, the systematic assessment of past, present and future climate influences and the assessment of ecosystem functions and derived services as part of development planning processes are new. The discussion on global change offers an opportunity to enhance ecosystem-based solutions as they can provide sustainable and cost-effective development options.

Lots of experience is gathered in countries. To make this useable beyond the scope of an individual country and programme, exchange between countries, learning from other experiences and "meta-level" information needs to be facilitated.

General recommendations to support the implementation of EbA:

- *Develop a decision tree on vulnerability assessments; provide a systematized collection of methods for vulnerability assessments (together with examples of applications)*
- *Provide systematized catalogues of potential EbA-measures (responding to different climate stimuli, and for particular ecosystems and different scales, including time scales)*
- *Support the evaluation of EbA's (co) benefits*
- *Gather examples of M&E of EbA and share experiences and indicators*
- *Analyse indicators used in existing EbA projects / programmes to identify common themes of what could / should be measured across EbA measures*

From the implementation perspective, three main topics were raised during the discussions:

a) How to deal with the 'un-knowable' in the implementation of EbA?

b) How to enhance the sustainability of EbA (beyond the life of a project)?

c) Tracking the effectiveness: What are potential indicators for EbA?

The following summarizes the findings from the group work, recommendations and open questions.

a) How to deal with the 'un-knowable' in the implementation of EbA?

When discussing with decision makers as well as with technical counterparts, climate change, its effects and possible adaptation action are often deeply linked to "uncertainties". Advisors often see it as a big challenge that, despite the "unknowable" future, development and adaptation to climate change require decisions now.

The discussion showed that it is necessary to communicate "uncertainty" transparently: Firstly, the major part of uncertainty is related to the fact that future (climate change) depends on our decisions (on emission

levels) today – which mainly depends on political and economic factors (such as population growth, land-use changes, political systems, economic pathways etc.). Secondly, we are not able to foresee how the Earth's complex social and ecological systems will react to global change. In the face of simply not having a sufficient understanding of the complexities of ecosystems and climate change, we should apply risk-robust approaches that follow the precautionary principle established in the CBD. Thirdly, it is unclear if our interventions will lead to the desired effects – for this we have to engage in adaptive management including effective M&E, learning and exchanging experiences, and permanently refining interventions and our options.

Recommendations to technical advisors:

- *Have for yourself a vision, willingness to try and act*
- *Apply adaptive management, allow yourself to be wrong*
- *Use all available information (e.g. modelling, historic data, best practices from other regions)*
- *Develop a flexible portfolio of measures, including no-regret and precautionary measures*
- *Engage in counterpart-centred communication: inspire, facilitate and support decision making*
- *Make "uncertainty" transparent, take cultural factors (such as risk aversion) into account*

b) How to enhance the sustainability of EbA (beyond the life of a project)?

In some countries, EbA is part of full-fledged programmes, and thus linked to overall development objectives. However, as the topic is still new, and funding for innovation and exploration is often project-bound, the question came up of how to ensure impacts beyond the short duration.

Recommendations to technical / policy advisors:

- *Identify a focal point in the partner institution*
- *Find and use entry points in the benefitting sectors, ensure that EbA is integrated into budgets*
- *Ensure multi-sectoral participation and ownership through emphasis on cross-cutting benefits of EbA*
- *Integrate EbA into public investment programmes*
- *Communicate EbA as a complementary measure to existing / planned engineering adaptation options*
- *Make EbA (co-)benefits tangible. Economic valuations may provide valuable arguments. Use existing measures and benefits of sustainable natural resource management (many EbA-measures have developed out of nature conservation projects)*
- *Link EbA to partner's M&E systems, build partners capacities in M&E*

Recommendations to lobbyists:

- *Promote EbA at international policy level (COPs, side-events, etc.)*
- *Promote EbA at national level to relevant stakeholders (including private sector)*
- *Ensure EbA is integrated into international and national financing instruments*

Recommendations for donors / development partners

- *Promote EbA through dedicated programming and funding*
- *Look out for a mix of long-term public-private funding*
- *Use corporate social responsibility as an entry point to involve private sector*
- *Design incentives (e.g. BMU ICI funding) to get different departments to cooperate*

c) Tracking the effectiveness: What are potential indicators for EbA?

EbA should be effective; we thus need to link actions to results. There is not "one right way" and we all "learn by doing". M&E is a major tool for adaptive management. Evidence of effectiveness could help to overcome scepticism and promote future uptake of EbA. Possible indicators are displayed in the text box.

First ideas on designing indicators for EbA M&E (according to the 4 fields of adaptation activities)

Policy

- Reduction of vulnerability / increase of resilience both of ecosystems and ecosystem-dependent humans
- Integration of EbA into planning processes and strategies
- Diversity of stakeholders and sources of knowledge
- Climate-sensitive design of plans / programmes
- "Mainstreaming" (into sectoral policies)
- Avoided costs
- Benefits for people (short term / long term)

Measures

- Values of ecosystems and their services are recognized
- Decrease of negative impacts from human activities over ecosystems
- Relevant data fed into statistics
- Functional climate risk management systems (e.g. risk insurance)
- Economic instruments and incentives (market-based, government) for risk reduction available (e.g. PES)
- Infrastructure maintained

Capacity development

- Technical capacities developed and enhanced
- Traditional disaster risk management strategies and capacities enhanced

Ecosystem functioning and services

- Scientific knowledge communities strengthened
- Ecosystem functionality measured by appropriate proxies
- Existing knowledge systematized and non-knowledge identified and classified
- Bio-indicators for ecosystem services (climate sensitive) elaborated
- Sound research results and assessments
- Maintenance or increase of biodiversity

Open questions:

- *How can project results be linked to national M&E systems for long-term results tracking?*
- *What information is needed for adaptive management and learning from experience? How should it be displayed for exchange?*
- *Concerning monitoring ecosystem functions and services:*
  - *What are the minimum conditions under which the ecosystem can provide (a certain quantity of) the services – site parameters, climate niche, resilience to non-climatic stressors, etc. – where are the tipping points, and are managers able to recognize them in time?*
  - *How to effectively integrate local, technical and scientific knowledge from any existing sources?*

Annex

Organizers and facilitators:

Gisela Stolpe and Ralf Grunewald, BfN; Isabel Renner and Klemens Riha, GIZ; Barbara Fröde-Thierfelder, ECO Consult. For further questions please contact: isabel.renner@giz.de, klemens.riha@giz.de, gisela.stolpe@bfn-vilm.de

Excursion team*:*

Ralf Grunewald, BfN; Franziska Tanneberger, University of Greifswald.

Programme

Monday	Tuesday	Wednesday	Thursday	Friday
Conceptual framework – Basic concepts – International framework (CCD, CBD, UNFCCC) and current discussions – Iterative cycle of adaptation processes	**2. Assess vulnerabilities** – Terminology exercise, glossary – Vulnerability analysis tools: introduction to the MARISCO approach and *example* on implementation in Ecuador; *example* from Mexico – Discussion	**5. Monitor & evaluate** – Monitoring of adaptation effects and biodiversity / ecosystem services: Introduction, *example* and exercise	**Implementation** – Recap excursion: observations on adaptation and mitigation opportunities in the field – *Example*: a comparative analysis of EbA and engineering options for Lami Town, Fiji – Moving from principle to practice: *group work* on ▪ How to deal with the 'unknowable' in the implementation of EbA? ▪ How to enhance the sustainability of EbA (beyond the life of a project)? ▪ Tracking the effectiveness: What are potential indicators for EbA?	**Wrap-up** – Advisory services and resources – Business opportunities / financing options – Evaluation and next steps
Lunch break				
1. Predefine objective & process – Scope , context , entry points: *examples* from Costa Rica, Ecuador and Vietnam – Discussion	**3.+4. Identify adaptation options / prioritize adaptation options and trade offs** – Adaptation options matrix – Methodological approaches illustrated by *examples* (international; Europe) – Benefits of EbA: economic approaches in general, example from Vietnam – Discussion	**EXCURSION** **"Biosphere Reserve of Southeast Rügen – Examples of Climate Change Adaptation and Mitigation"** to Neuensiener See (ecosystem services of peatlands) and Klein Zicker (coastal defence as well as sea grass beds).	– Economic arguments to communicate the advantages of EbA approaches and measures? – *Role play* 'elevator talk'	