

Sector-wise application

Natural ecosystems

- Efforts should be focused on research and impact assessment, strengthening monitoring capabilities and community based conservation programmes
- Draw up adaptation plans and practices specifically focused on desertification, alpine environments, and protected areas
- Promote awareness in society and involve people in the assessments of the vulnerability of ecosystems and dependent industries or communities, and in the formulation and implementation of specific adaptation strategies
- Train local people on fire control, connecting habitat, forest governance etc.

Agriculture

- Improve research and knowledge on the impacts (for example, food security) and costs of adaptation options, giving special attention to indigenous and local crops, seeds and technologies
- Raise awareness and improve capacity building in the sector, including training farmers on compost and shed improvement, organic fertilizers, integrated pest

management, microirrigation technologies, insecticide hazard reduction, breed improvement, choice of species, conservation agriculture, green house horticulture etc.

- Develop more efficient agricultural techniques, new cultivars, home garden, community seed and grain storage centre
- Given the special relation of agriculture to flood and drought risk management, biodiversity and market changes, a crosssectoral approach is particularly important for agriculture

Water management

- Improve water resources management, including flood risk and drought control
- Integrate climate change considerations into spatial and water resources planning
- Improve understanding on impacts and raise awareness, by engaging with water utilities and water users
- Integrate water resources management with other national policies and sectors, especially landuse, urban planning, energy and tourism
- Capacitate local people on rain water harvesting and ghaito, pond and gabion wall construction

Cost of Non-implementation



Biodiversity loss



Food insecurity



Increase in incidence of natural disaster



Impact on livelihood



Natural resource degradation



Loss of human lives and property

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Ecosystem based Adaptation



Implementing Partners



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EbA Concept

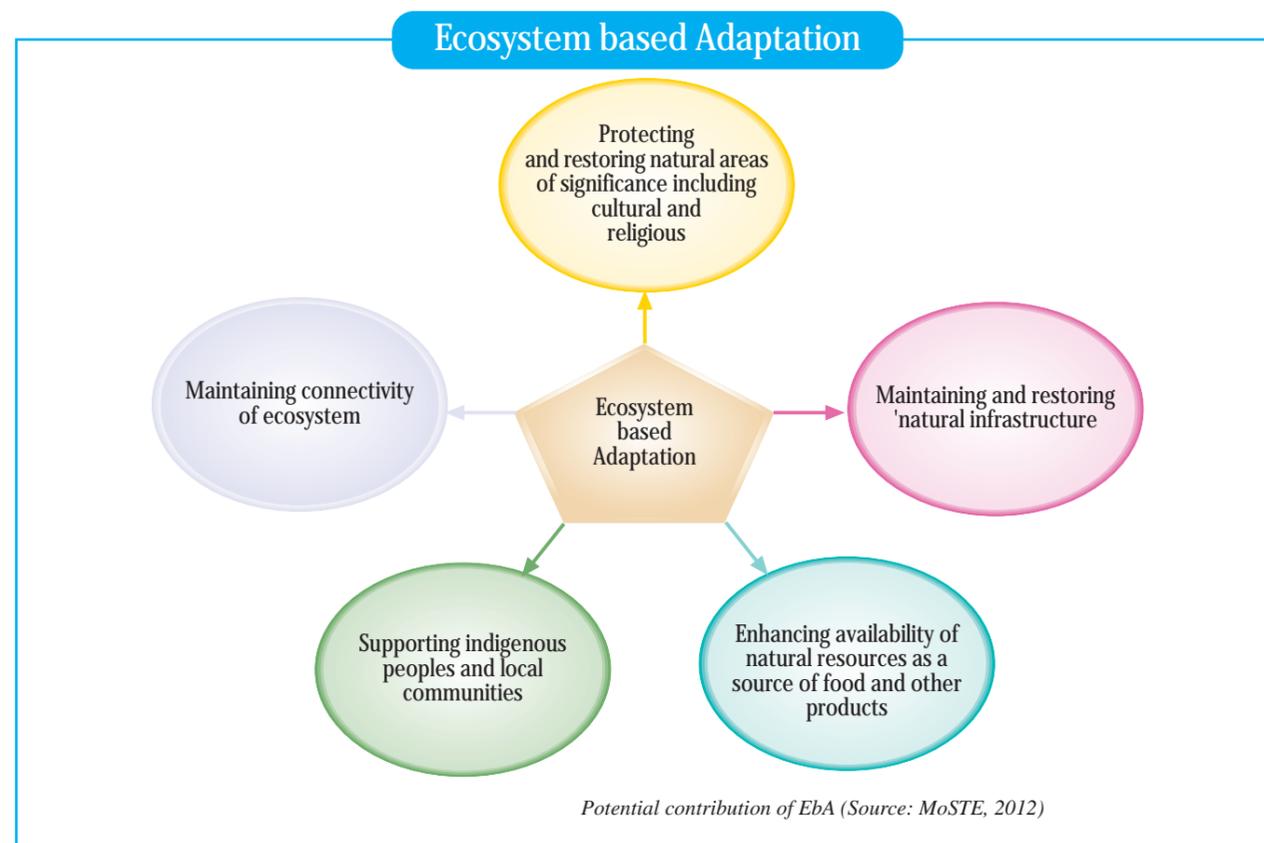
The impacts of climate change on human and natural systems are already being felt on a global scale and are predicted to intensify in the future. Increased climate variability such as occurrence of more frequent droughts, storms and more erratic or intense rainfall patterns are associated with such changes that can significantly affect the natural ecosystems and their capacities thus disrupting the ecosystem services and the communities that depend on it.

A healthy ecosystem and its services provide opportunities for sustainable economic prosperity and protection against the negative effects of climate change. On the other hand, degradation of such ecosystem results in increased climate change vulnerability of communities as well as the ecosystem itself. Therefore, the concept of Ecosystem based Adaptation (EbA) has emerged to aid vulnerable communities to adapt with climate change along with continuation of ecosystem services through restoration and sustenance of ecosystems.

EbA ensures restoration, maintenance and enhancement of ecosystem values in face of climate change impacts. It is an emerging approach to assist communities to adapt to the adverse impacts of climate change by using biodiversity and ecosystem services as a part of overall adaptation strategy. It uses sustainable management, conservation and restoration of ecosystem taking into account anticipated climate change impact trends to reduce vulnerability and improve the resilience of ecosystems and community. Basically, EbA addresses crucial links between climate change, biodiversity, ecosystem services and sustainable resource management.



EbA invites collective action from the government, communities, conservation and development organizations and other stakeholders to plan and empower local action, to increase environment and community resilience to climate change. It provides cost effective strategies and is especially effective at the local level with active community involvement. Plantation of tree species with high water retention capacity in drought areas, identification and plantation of species to reduce erosion and landslides, sustainable management of natural resources to ensure maximize benefit to the communities are some examples of this approach. Management of agriculture land, applying local knowledge of specific crop and livestock varieties, and selection of species based on problem solving approach are some of the examples of EbA. As EbA exploits the full potentiality of ecosystems, it is more effective, has multiple use value and provides cheaper options to building and maintaining physical engineering structures as dykes or concrete walls.



Principles

Some of the fundamental guiding principles for effective EbA are as follows:

Building upon existing good practices

The most effective EbA strategies apply best practices in land, water, and natural resource management to confront challenges posed by climate change. The application of the ecosystem approach for the integrated management of resources is particularly appropriate to the implementation of Ecosystembased Adaptation.

Involving local communities

Community participation is an important element in application of EbA options. Ecosystem based Adaptation measures are more successful when the local population participates in both planning and implementation.

Multipartnership strategy development

EbA presents a tangible opportunity to solve climate change problems by aligning conservation, development, and poverty alleviation interests. Such combined efforts benefit from collaboration between indigenous and local communities, conservationists, natural resource managers, private sector stakeholders, development specialists, and humanitarian aid specialists.

Integrating with wider adaptation strategies

Successful adaptation depends upon integrating Ecosystembased Adaptation initiatives with other risk management components, such as early warning systems and awarenessraising, and in some cases with physical infrastructural interventions. It is important to encourage and enable technology transfer and dialogue between planners and practitioners with expertise in hard engineering, and in ecosystem management. Following these principles, EbA adopts wide range of ecosystem management activities to reduce the vulnerability in the face of climate change. Those activities are:

- The river basins, flood plains, and their associated vegetation are managed for sustainable water source management
- The grasslands and rangelands are sustainably managed to enhance pastoral livelihood and to increase resilience to drought and flooding
- The diverse agricultural systems are established using indigenous knowledge of specific crop and livestock varieties, maintaining genetic diversity of crops and livestock, and conserving diverse agricultural landscapes ensuring food security in changing local climatic conditions
- The forest is strategically managed by addressing the different drivers of forest degradation
- The protected area systems are established and managed to ensure the continued supply of ecosystem services

Applications

Although the importance of Ecosystem based Adaptation (EbA) is being increasingly recognized, robust information on specific benefits of EbA and the conditions under which those benefits are likely to be received is generally lacking (World Bank, 2010). The guiding framework asks decision makers to consider EbA on a level playing field with the suite of available adaptation technologies and provide supporting information on context specific EbA options and their opportunities and limitation where available.

The framework consists of four components that are carried out step by step in a cyclic manner.

Component A: Setting the adaptive context

This component supports the selection of the most appropriate options for adaptation in a given context with a view to establish where information gaps exist. Here, ecosystems and the associated services are taken into consideration to inform a problem statement and goal definition. After defining the problems, an adaptation intervention will address it with an ecosystem lens and EbA options are identified.

Component C: Design for change

This component supports the transition from a list of selected intervention measures to develop a program that will guide implementation and define a plan to evaluate and reflect on performance. This step will guide in project design and evaluation to facilitate longterm adaptive management and deliver 'evidence for persuasion'. This sets the foundation for continued support for EbA initiatives whilst ensuring transparency and accountability in implementation.

Component D: Adaptive implementation

As EbA requires a long term view, this step advocates an adaptive, flexible and sustainable approach for implementation of EbA options. There are four steps within this component:

- Monitoring progress
- Data Interpretation
- Reflect and Adapt
- Develop an evidence base for EbA effectiveness

Component B: Selecting appropriate adaptation options

This component helps in identification of appropriate intervention measures and associated context specific adaptive actions. The adaptation technologies are grouped by ecosystem services with their associated benefits and limitations and provided to guide selection of intervention measures with a view to maintain and enhance ecosystem resilience.

