Training on Ecosystem-based Adaptation (EbA)

GEF LDCFII Project: Ecosystem-based Adaptation for Rural Resilience in Tanzania

18 December 2019

Trainer: Dr. Lili Ilieva

Co-trainers:

Dr. Emma T. Liwenga
Dr. Catherine A. Masao
Dr. James G. Lyimo
Prof. Amos E. Majule

P2

Agenda

A. Definition of Ecosystem-based Adaptation (EbA)

B. The mainstreaming cycle of EbA in national planning

C. Stepwise approach to design and implement EbA solutions

A. Definition of Ecosystem-based Adaptation

- Ecosystem services and their role in adaptation
- Climate risks for ecosystems and livelihoods
- Ecosystem-based Adaptation (EbA)

P4

A. Definition of Ecosystem-based Adaptation (EbA)

Learning outcomes:

- Consolidate basic concepts of ecosystem and ecosystem services and their relevance to climate adaptation
- Knowledge on EbA concept, principles and benefits
- Understanding of processes for EbA planning and mainstreaming in national planning

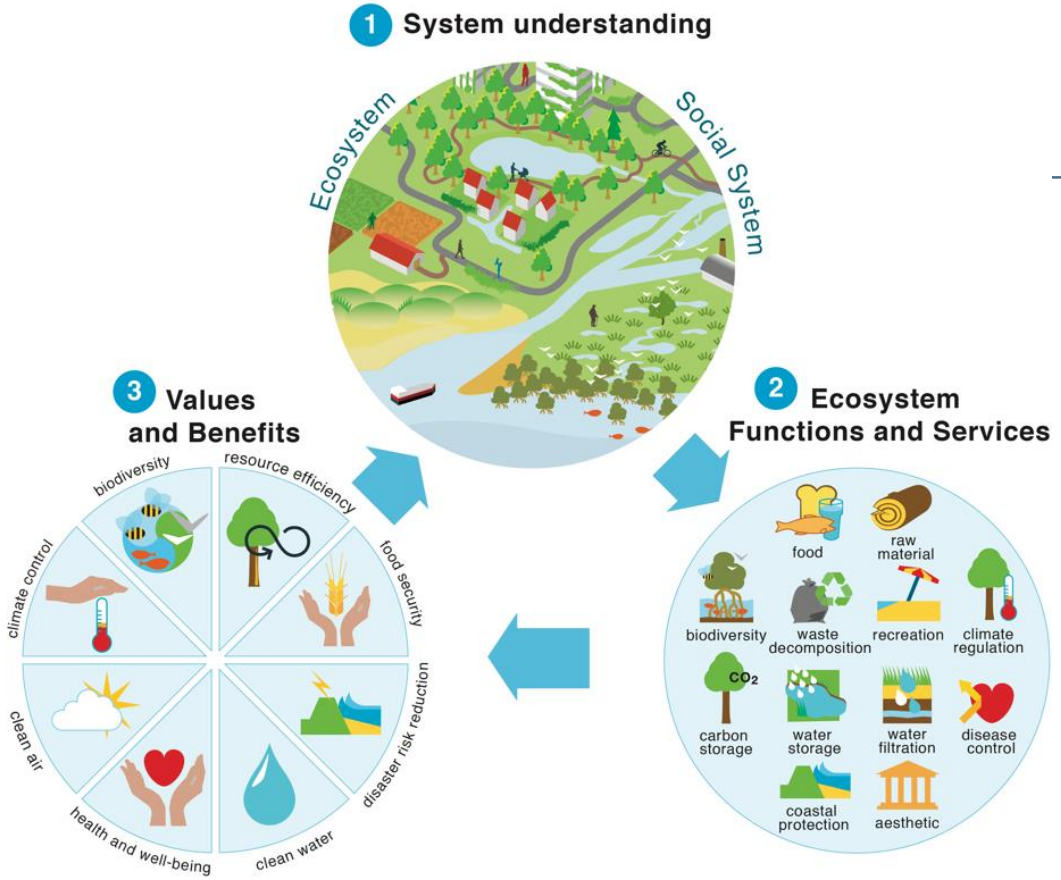
P5

Ecosystem services

Ecosystem services are the benefits that people obtain from the ecosystems (MEA, 2005).

Categories of ecosystem services

Provisioning services	Food, fodder, building materials
Regulating services	Water quality, Hydrological regulation, climate regulation, storm protection
Cultural services	Recreational/aesthetic values, tourism, religious values
Supporting services	Soil formation, habitat provision



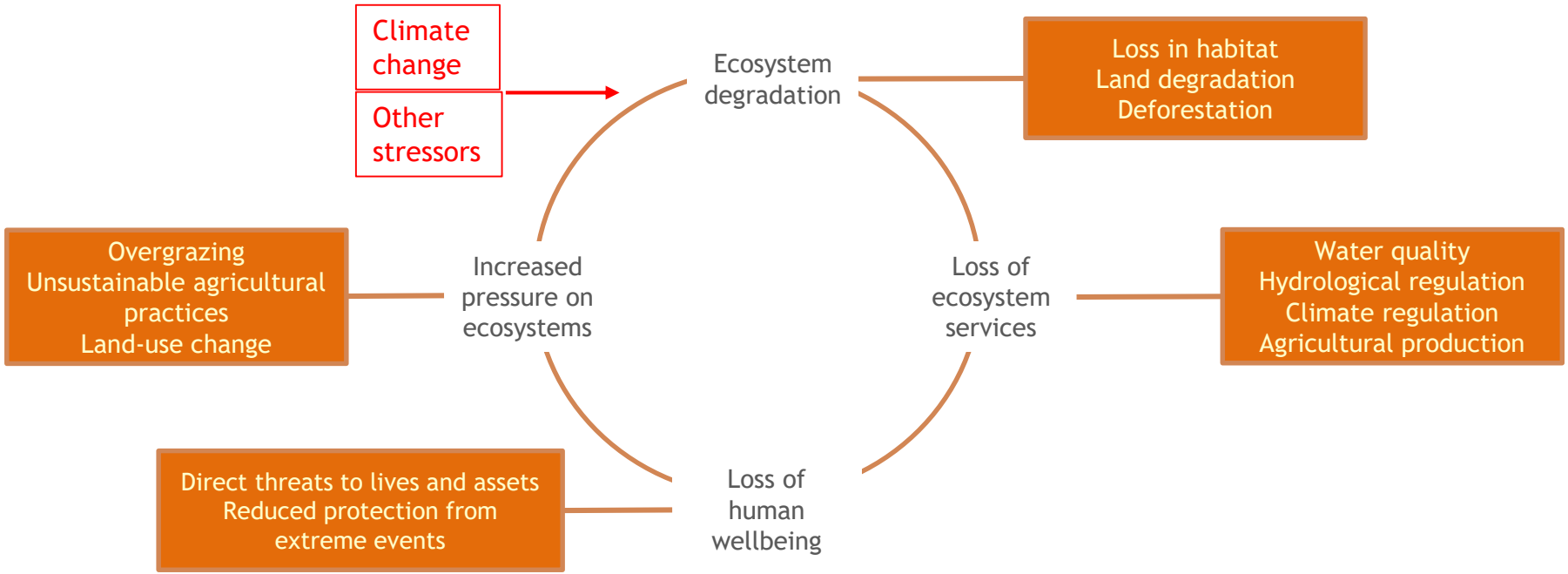
Example of ecosystem services and their values

Adaptation services

@INECC, 2016

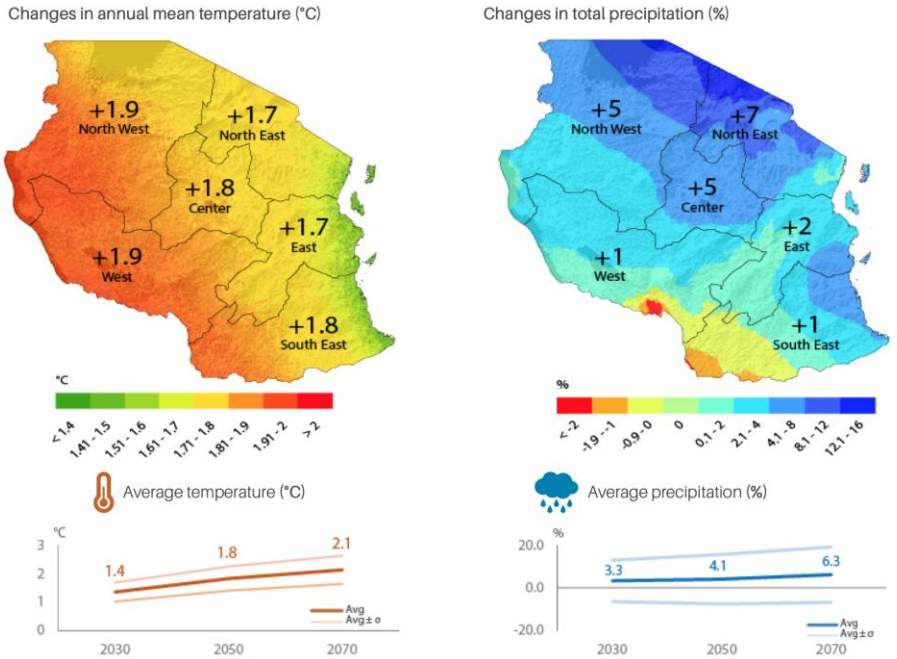
Provisioning services	Products
Regulating services	• Flood protection • Coastal protection • Storm buffer/protection • Landslide prevention • Erosion protection • Drought protection

Climate threats for ecosystems and livelihoods



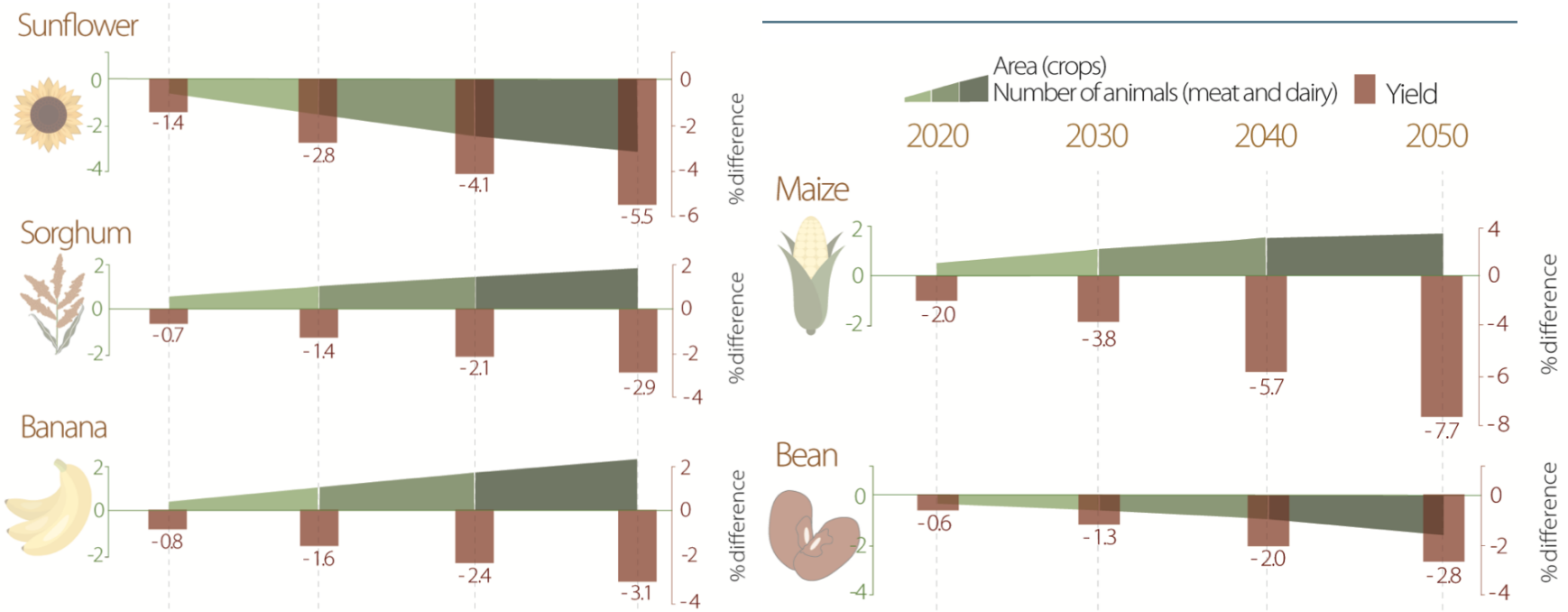
Climate change in Tanzania

Climate projections indicate an increase in temperatures by 1.4°C by the 2030s and 2.1°C by 2070. The West and North- West will most likely experience faster warming (+1.9°C). **Extreme events (droughts) are expected to be more frequent and severe.**



Source: CIAT/ World Bank. 2017.
https://cgspace.cgiar.org/bitstream/handle/10568/83482/CSA_Profile_Tanzania.pdf

Climate change impacts on yield, crop area in Tanzania



Source: CIAT/ World Bank. 2017.
https://cgspace.cgiar.org/bitstream/handle/10568/83482/CSA_Profile_Tanzania.pdf

Nature-based Solutions

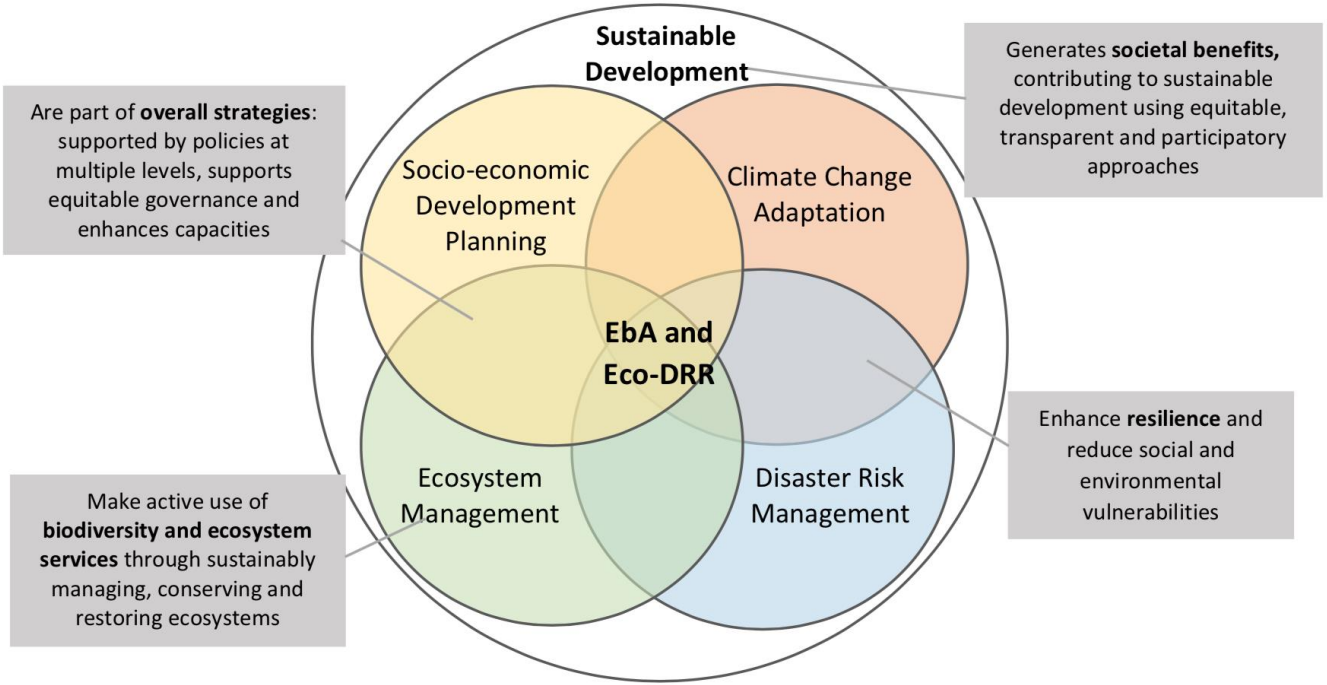
Nature-based Solutions (NbS)

Nature-based Solutions are (...) actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits (Cohen-Shacham et al. 2016)

EbA approach: Definition

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.

EbA approach



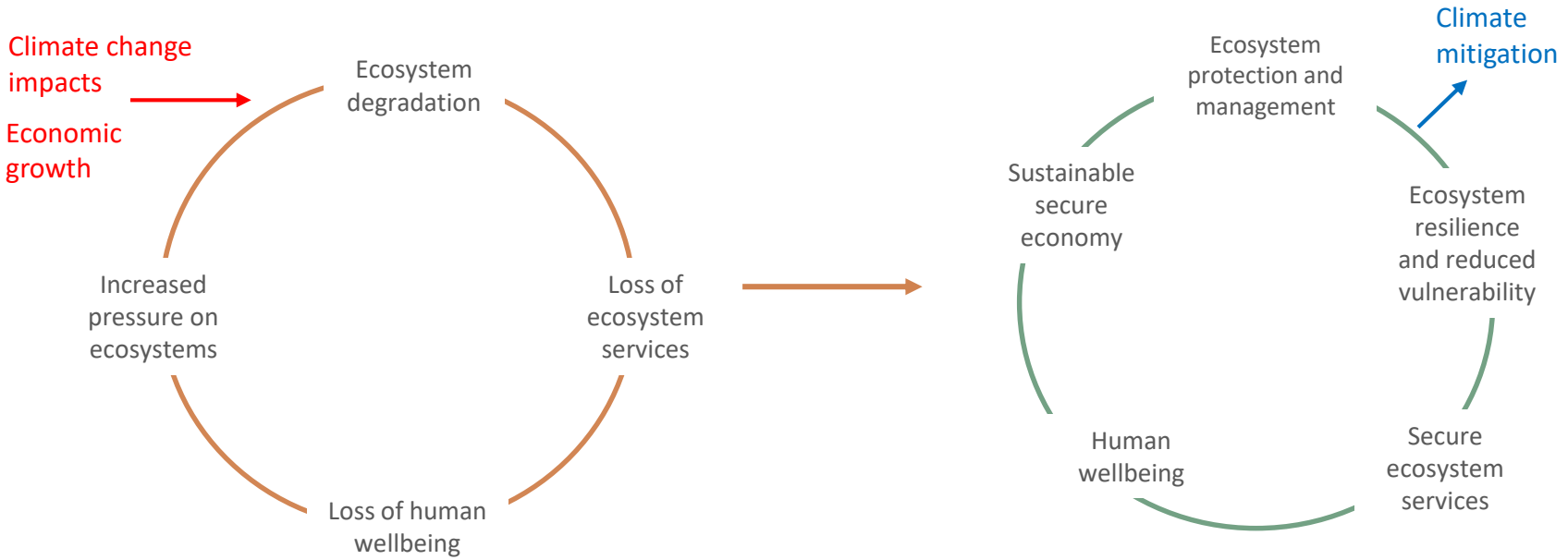
Examples of EbA solutions

- Sustainable management of upland wetlands, forests, and floodplains for the regulation of water flow and control of water quality;
- Conservation and restoration of forests to stabilise land slopes and reduce risk from landslides;
- Establishment of diverse agroforestry systems to cope with increased risk from changes in climate conditions;
- Management of ecosystems to complement, protect and extend the longevity of investments in hard infrastructure;

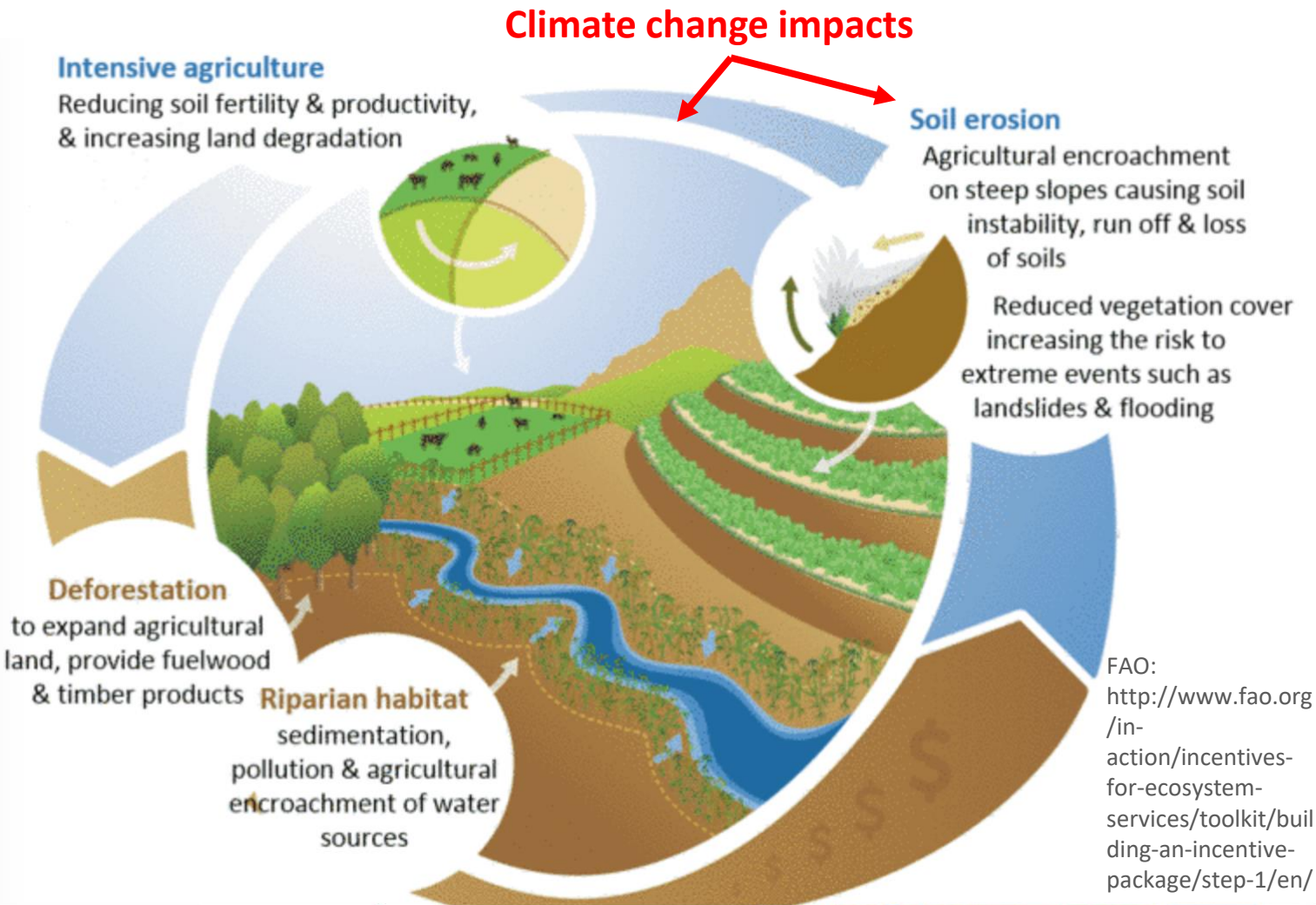
Benefits of EbA

1) Drivers and impacts of ecosystem degradation

2) With ecosystem-based adaptation

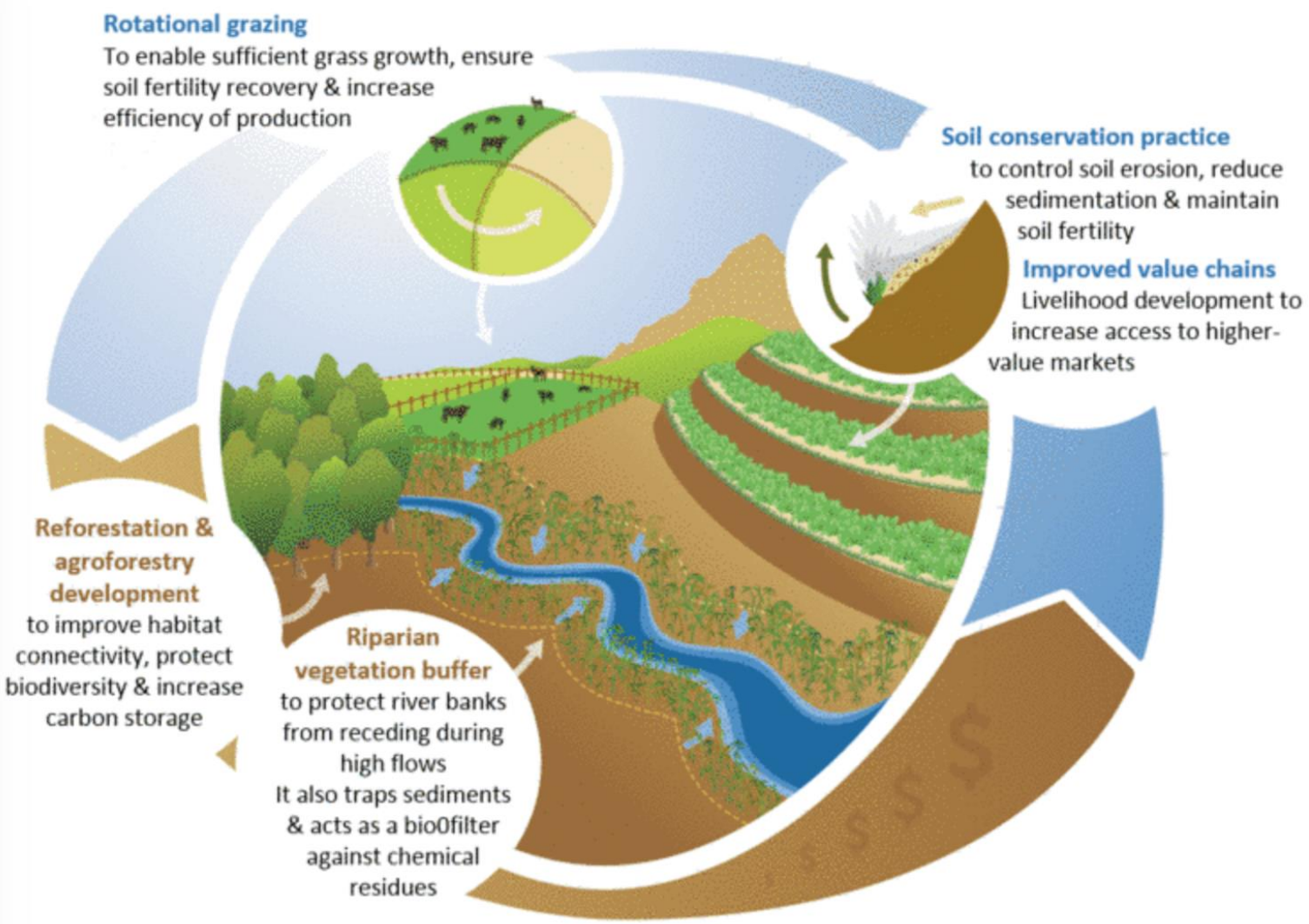


Threats to ecosystem services



FAO: http://www.fao.org/in-action/incentives-for-ecosystem-services/toolkit/building-an-incentive-package/step-1/en/

EbA solutions



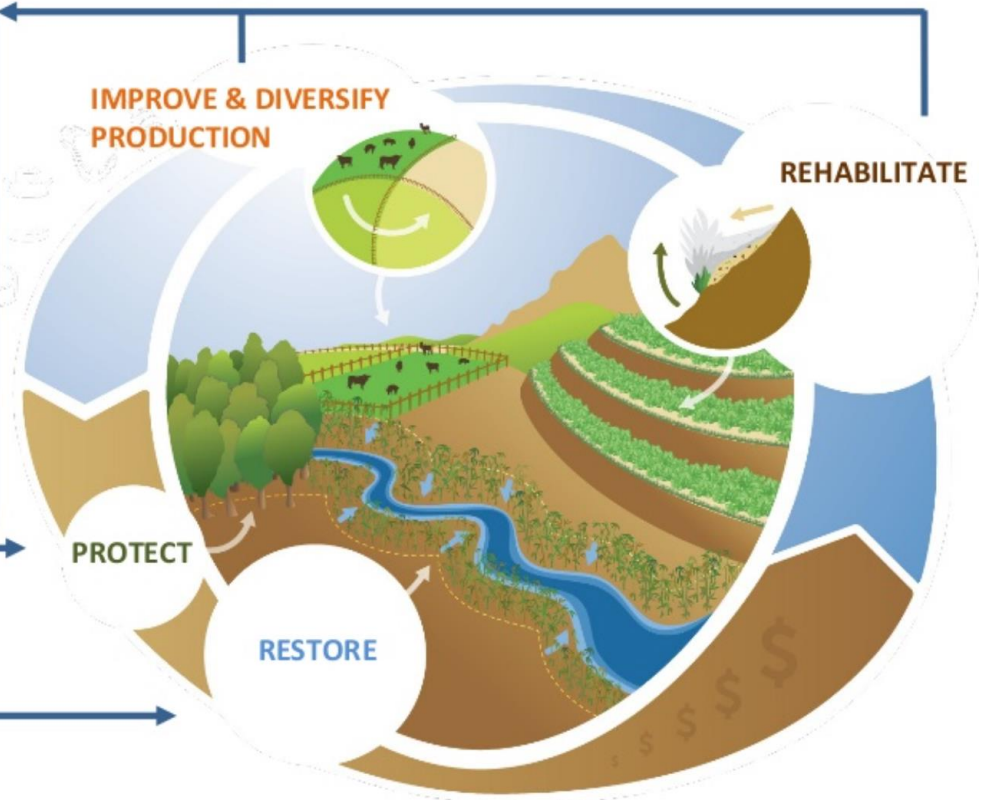
EbA solutions and insentives

To overcome these barriers, farmers require **INCENTIVES** to

- **Overcome SHORT-TERM needs**
- **Support a LONG-TERM transition**

Improved and diversified productivity allows for greater investment in EbA to protect, rehabilitate and restore sensitive habitats

- Without compromising food security
- Supports building resilience of agriculture-based livelihoods and agro-ecosystems
- With ecosystem services benefits for farmers and other users



Difference between adaptation approaches

Adaptation focused on ecosystems

(i) The direct beneficiaries are ecosystems and species, who are being helped to adapt, but NOT directly people

(i) Outcome indicators focus on measurements on the state of ecosystems and species and NOT on the adaptation impact for people.

Community-based Adaptation

(i) The direct beneficiaries are people who are being helped to adapt, but NOT through ecosystem management and conservation.

(i) Outcome indicators focus on measurements on the adaptation impact on people

Ecosystem-based Adaptation

(i) The direct beneficiaries are the people who are being helped to adapt through ecosystem management and conservation.

(ii) Outcome indicators focus on measurements on the state of ecosystem services and their adaptation impact on people.

P20

Examples

1. Measu

Community-based Adaptation

ly through
ition system

2 Measure
t

Adaptation focused on ecosystems

preservation

3. Measur
populat

Ecosystem-based Adaptation

nsure the
OMMUNITY

Criteria for defining EbA solutions

Element A – EbA helps people adapt to climate change

- Criterion 1. Reduces social and environmental vulnerabilities
- Criterion 2. Generates societal benefits in the context of climate change adaptation

Element B – EbA makes active use of biodiversity and ecosystem services

- Criterion 3. Restores, maintains or improves ecosystem health

Element C – EbA is part of an overall adaptation strategy

- Criterion 4. Is supported by policies at multiple levels
- Criterion 5. Supports equitable governance and enhances capacities

Source: Friends of EbA, 2016

P22

Criteria: EbA measures should…

- ✓ Reduce social and environmental vulnerabilities to climate change
- ✓ Generate societal benefits in the context of climate change adaptation.
- ✓ Restore, maintain or improve ecosystem health adopting ecosystem approach principles
- ✓ Are determined by site-specific natural and cultural contexts that include traditional, local and scientific knowledge
- ✓ Maintain biological and cultural diversity and the ability of ecosystems to function
- ✓ Are an integral part of the overall design of policies, and measures or actions, to address a specific challenge.

What EbA solutions can be implemented in mountain ecosystems?

CLIMATE PROBLEM

Flooding and sediment deposition resulting from extreme rainfall, rainfall variability and increasingly frequent and severe storms

EBA SOLUTION

Riparian reforestation/rehabilitation along riverbanks to slow run-off and capture sediment before it reaches the water course, thus limiting down-stream flood damage to property and livelihoods

P24

What EbA solutions can be implemented in dryland ecosystems?

CLIMATE PROBLEM

Drought, desertification and soil erosion resulting from increasing temperatures, reduced and more variable rainfall, and increasingly frequent and severe wind/ sand storms

EBA SOLUTION

Climate-resilient grazing and livestock management to regenerate vegetation, increase forage quality and quantity, increase water availability, improve soil quality, and safeguard livestock, thus improving food and income security

What EbA solutions can be implemented in coastal ecosystems?

CLIMATE PROBLEM

Flooding and increased invasive species resulting from extreme rainfall, rising temperatures and increasingly frequent and severe storms

EBA SOLUTION

Wetland rehabilitation to reduce flood damage, enable groundwater recharge and improve water quality, and reduce pests affecting agriculture, thus improving food and income security

What are the benefits, costs and impacts of EbA solutions?

@Hannah McNeish/UN Environment

BENEFITS

Primary adaptation benefits

i.e. the benefit of reducing climate change related risk, e.g. sustained agricutlural productivity

Additional adaptation benefits

e.g. mitigation of storms and flood damages, year-round water supplies, sustained farmland productivity in the face of drought, maintenance of species habitat, etc.

Co-benefits

e.g. improved health, better food supplies, new and diversified income opportunities, disaster risk reduction, watershed protection, enhanced biodiversity, etc.

COSTS

Direct implementation expenses

e.g. staff, equipment, transport, infrastructure, maintenance, etc.

Core institutional & enabling costs

e.g. training, development of plans, laws, policies, incentives, etc.

Opportunity costs

e.g. foregone income and output due to land use restrictions, etc.

Social & environmental losses

e.g. negative impacts on women, downstream communities, etc.

IMPACTS

Temporal impacts

When do costs and benefits fall over time? e.g. rate at which habitat recovery restores ecosystem services, when intervention costs are incurred, interests of future generations, etc.

Spatial impacts

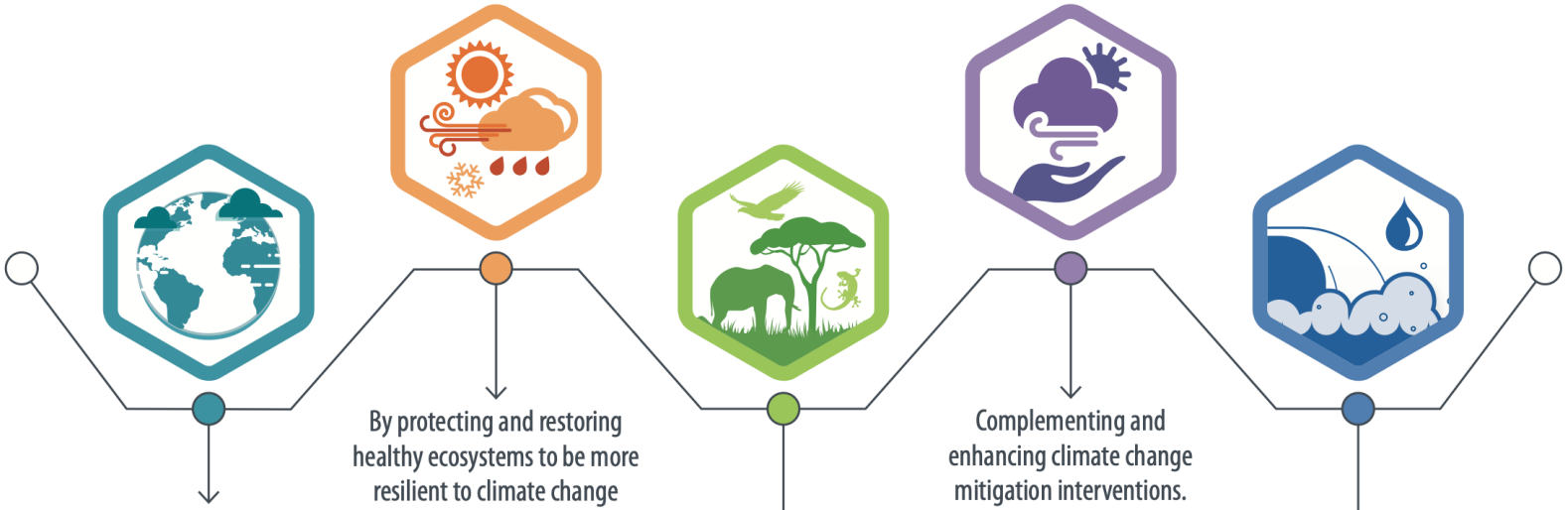
Where do costs and benefits fall spatially? e.g. gains and losses for upstream and downstream communities, costs and benefits to ecosystem providers and users, effects across borders, etc.

Distributional impacts

Where do costs and benefits fall demographically? e.g. changes in resource access or income opportunities between women and men, rich and poor, urban and rural, regions, sectors, communities, etc.

Source: UNEP-WCMC/UN Environment, 2019.

What are the potential benefits for implementing EbA?



Promoting healthy ecosystems that play an important role in protecting infrastructure and enhancing human security, acting as natural barriers and mitigating the impact of extreme weather events.

By protecting and restoring healthy ecosystems to be more resilient to climate change impacts, EbA strategies can help to ensure continued availability and access to essential natural resources so that communities can better cope with current climate variability and future climate change.

Protecting, restoring, and managing key ecosystems helps biodiversity and people to adjust to changing climatic conditions.

Complementing and enhancing climate change mitigation interventions.

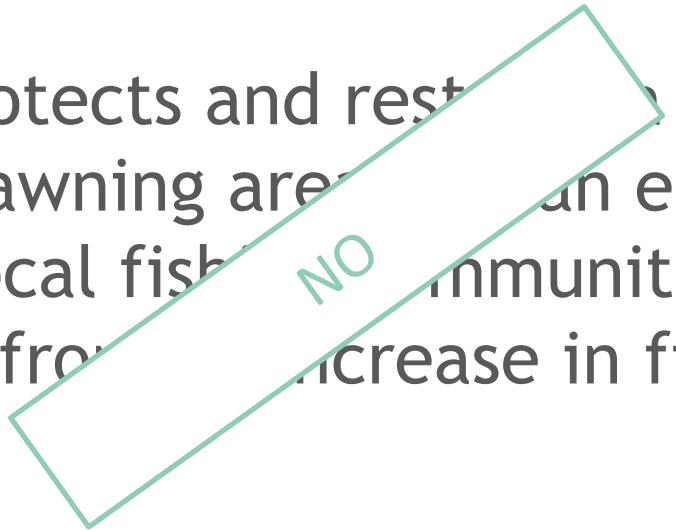
Managing, restoring and protecting ecosystems can also contribute to sustainable water management.

Exercise: Is it EbA or not?

An NGO protects and restores a wetland to provide spawning areas for an endangered fish species. Local fishing communities are benefiting from an increase in fish production.

Exercise: Is it EbA or not?

An NGO protects and rest[illegible] wetland to provide spawning are[illegible]an endangered fish species. Local fish[illegible]mmunities are benefiting fro[illegible]ncrease in fish production.



Exercise: Is it EbA or not?

It is discovered that an area of the Protected Area provides a critical habitat for a species of duck in danger of extinction. As it is a very fragile ecosystem, climate change will have irreversible impacts on the ecosystem in this area. The Protected Area team decided to restore part of the area to strengthen the recovery capacity of the critical ecosystem.

Exercise: Is it EbA or not?

It is discovered that an area of the Protected Area provides a critical habitat for a [illegible]ies of duck in danger of extinction. As it is a ver[illegible]e ecosystem, climate change will have irrev[illegible]mpacts on the ecosystem in this area. The P[illegible]ed Area team decided to restore part of the area [illegible]trengthen the recovery capacity of the critical ecosystem.

YES

Exercise: Is it EbA or not?

A community lives near a wetland and uses the water from it for agriculture. Due to variations of rainfall and temperatures, the community notices that the lake has shrunk and it is not so easy to use water from it. Authorities and the community decide to restore the wetland and its buffer zone to improve its capacity to retain water.

Exercise: Is it EbA or not?

A community lives near a wetland and uses the water from it for agriculture. Due to variati[illegible]f rainfall and temperatures, the commun[illegible]ces that the lake has shrunk and it is not so [illegible]use water from it. Authorities and the [illegible]nity decide to restore the wetland and its [illegible]zone to improve its capacity to retain water.

YES

Cost-benefit analysis of EbA solutions: Fiji

The analysis looked over a 20-year time horizon and considered benefits, including reduced health costs, avoided damages to businesses and households, and wider ecosystem services being maintained or enhanced.

Scenario	Benefit-to-cost ratio (FJD)	Assumed damage avoidance
Ecosystem-based options	$19.50	10–25%
Emphasis on ecosystem-based options	$15.00	25%
Emphasis on engineering options	$8.00	25%
Engineering options	$9.00	25–50%

Source: http://www.sprep.org/attachments/Publications/Lami_Town_EbA_Synthesis.pdf

EbA for water security in Uganda (1)

© Andrea Egan, UNDP

The Ecosystem-Based Adaptation in Mountain Ecosystems Project (MEbA Project)

Where? - Montane grasslands and shrublands of the Mount Elgon region, in the districts of Kapchorwa, Kween, Sironko and Bulambuli

Who benefited? Approximately 582,400 people live in these four districts, the population is entirely rural and dependent on subsistence agriculture.

EbA for water security in Uganda (2)

What were the EbA measures? - Enhance the local ecosystem's capacity to produce services and to withstand climate change, by addressing soil and water supply issues and overexploitation of the land:

- Soil conservation measures that enhanced soil productivity, fertility and moisture retention, and reduced erosion
- Agroforestry measures that reduced landslides
- The planting of indigenous drought-tolerant grass, enhancing the grasslands' capacity to store carbon.

EbA for water security in Uganda (3)

Economic benefits:

Cost-benefit analysis showed that not only were the EbA practices economically viable, but that this viability could be sustained over a 15-year projection period. Projected benefits were highest in Bugitimwa sub-county, Sironko District, where gains equated to an estimated US$14,743 per farm household over 15 years.

EbA for water security in Uganda (4)

Social and environmental benefits:

- Soil and water conservation increased income, due to increased productivity and reduced expenditure on agricultural inputs
- Drought-resistant seed varieties increased productivity and income
- Consistent water provision improved livelihoods and income from the sale of a wider variety of crops
- Land value increased
- The ability to leverage additional fund, for example from district government budgets.

Case study: Durban, South Africa (1)

- **Droughts** in South Africa are becoming increasingly more common.
- South Africa's EbA activities have focused primarily on watershed management and terrestrial conservation (e.g. dryland and rangeland conservation and restoration).
- South Africa has developed the Strategic Framework and Overarching Implementation Plan for Ecosystem-based Adaptation in South Africa (2016–2021), supported by EbA Guidelines, which aims to promote EbA as a central component of the country's programme of work on biodiversity and climate change.

Case study: Durban, South Africa (2)

CLIMATE PROBLEM

Massive waves are washing away sections of the promenade and damaging nearby restaurants. This, combined with continuous impacts from wind-blown sand and likelihood of rising sea levels.

EBA SOLUTION

Rehabilitated dune vegetation Durban, South Africa, 2016

Why choosing EbA approach ?

- It is a cost-effective option compared to engineering alternatives
- It provides social, economic and environmental co-benefits
- It is a cross-sectoral approach – ecosystems are important for the agriculture, water, energy, tourism sectors

Key messages

Drawing on the linkages between ecosystem services, climate change and biodiversity, EbA is an approach to sustainable development that contributes to three outcomes simultaneously: socio-economic benefits, climate change adaptation (risk and vulnerability reduction) and biodiversity conservation.

Sectors such as water resources and agriculture are particularly vulnerable to climate change because they depend on ecosystems and the services, they provide.

EbA can be a cost-effective adaptation measure compared to engineered solutions.

Ecosystems provide services important for the adaptation of different sectors and livelihoods.

B. The mainstreaming cycle of EbA in development planning

- Why mainstreaming EbA?
- What are the entry points for EbA mainstreaming?
- What is the process for mainstreaming EbA into national planning?

B. The mainstreaming cycle of EbA in development planning

Learning outcomes:

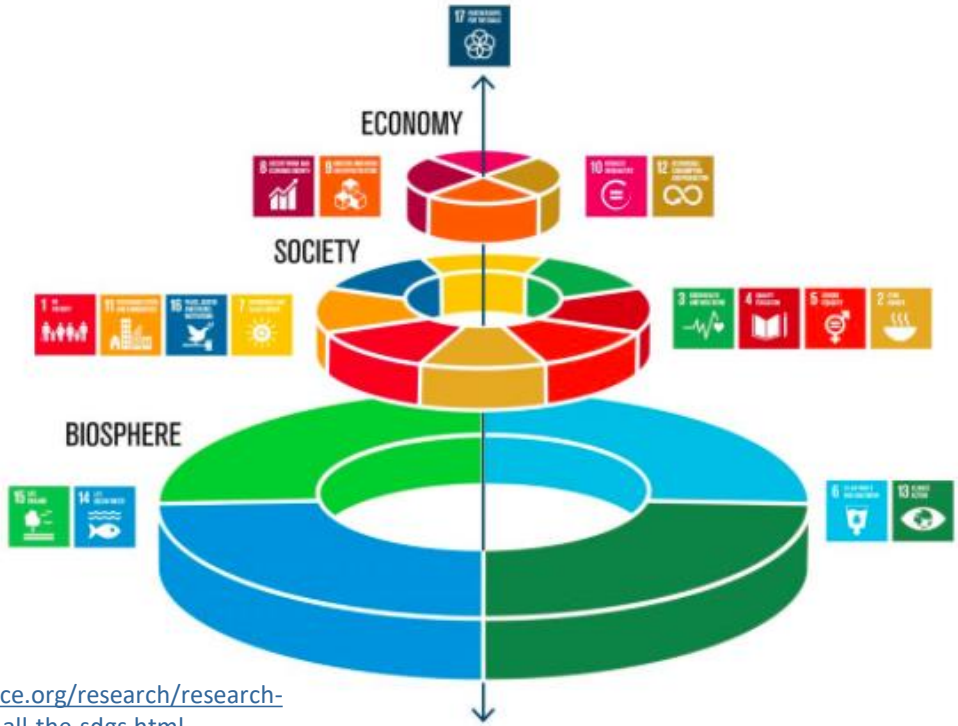
- Understand why mainstreaming of EbA is important and what is the process for mainstreaming in national planning.
- Learn to identify entry points for mainstreaming EbA
- Acquire an overview of approaches, policy instruments and entry points for mainstreaming in the Tanzania in context.

EbA and the Sustainable Development Goals (SDG)

- countries are beginning to create synergies: alignment with SDG, NDC and other processes and policies/conventions
- >> offers even … for alignment … international a… financing mech… Green Climate…

Climate change is a cross-cutting development issue that affects every aspect of sustainable development and the entire 2030 Agenda

Scaling up climate action is essential for achievement of the Sustainable Development Goals



Source: http://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html

Why mainstreaming EbA?

Mainstreaming EbA refers to the integration of ecosystem-based approaches into climate- and disaster-risk planning and decision-making processes at all levels.

EbA is acknowledged to be essential to achieving the sustainable development goals - SDG 2, 11, 13, 14 and 15.

EbA has the potential to effectively achieve adaptation objectives under NDC and NAPs at local, district and national level.

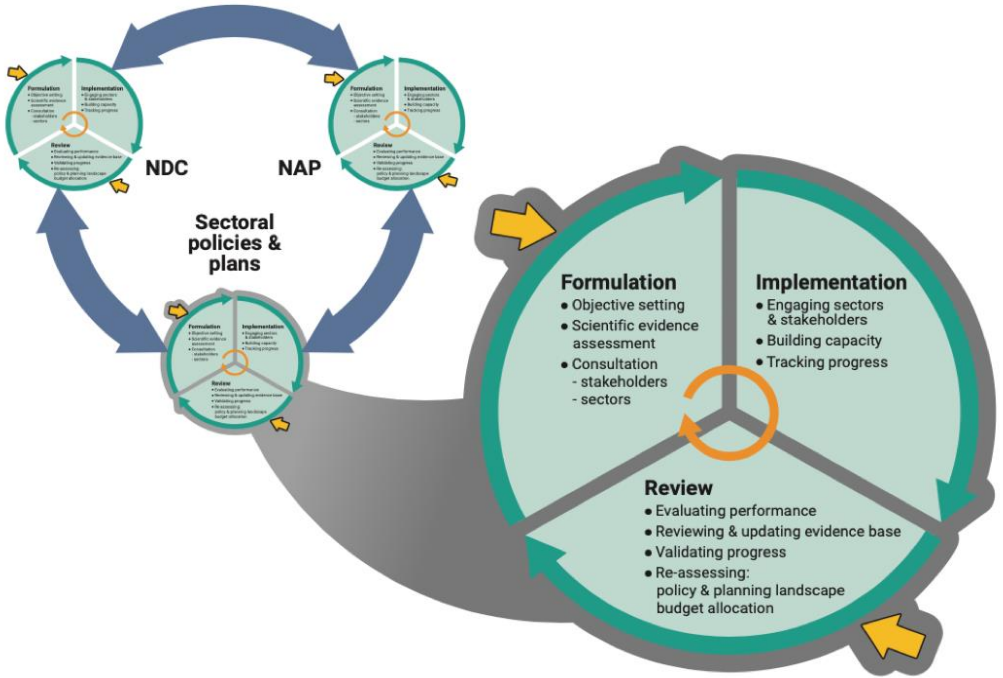
EbA is cross-sectoral and can decrease the vulnerability of climate sensitive sectors

What is the process for EbA mainstreaming in national planning?

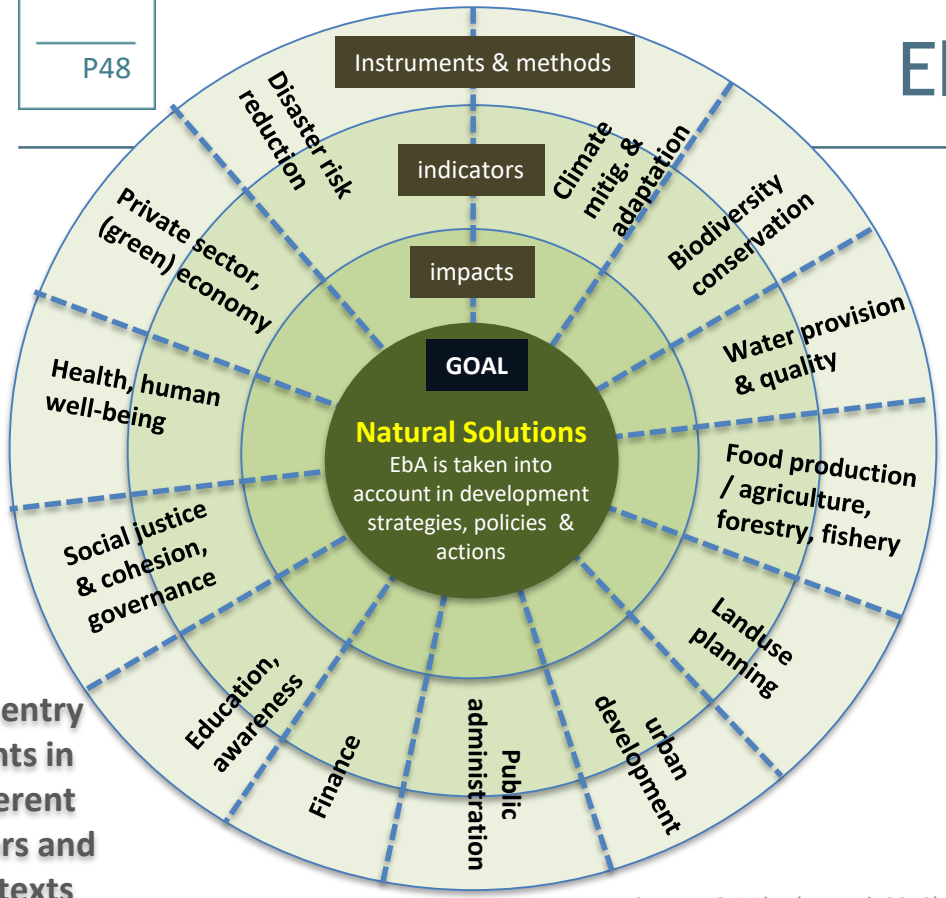
A. Develop the evidence and build the capacity of decision-makers

B. Screen policies, plans, laws and budgets to identify where harmonisation is needed

C. Understand the regular policy, planning and budgeting cycles to identify entry points



EbA Mainstreaming Goal



EbA entry points in different sectors and contexts

Overall goal: Livelihoods are enhanced & secured in the face of climate related risks

Goal: Development strategies take ecosystem-based approaches into account

Action: Mainstreaming => ecosystem services are taken into account in development strategies, policies & actions (at different levels of planning and implementation)

Source: GIZ-EbA (Amend, 2018)

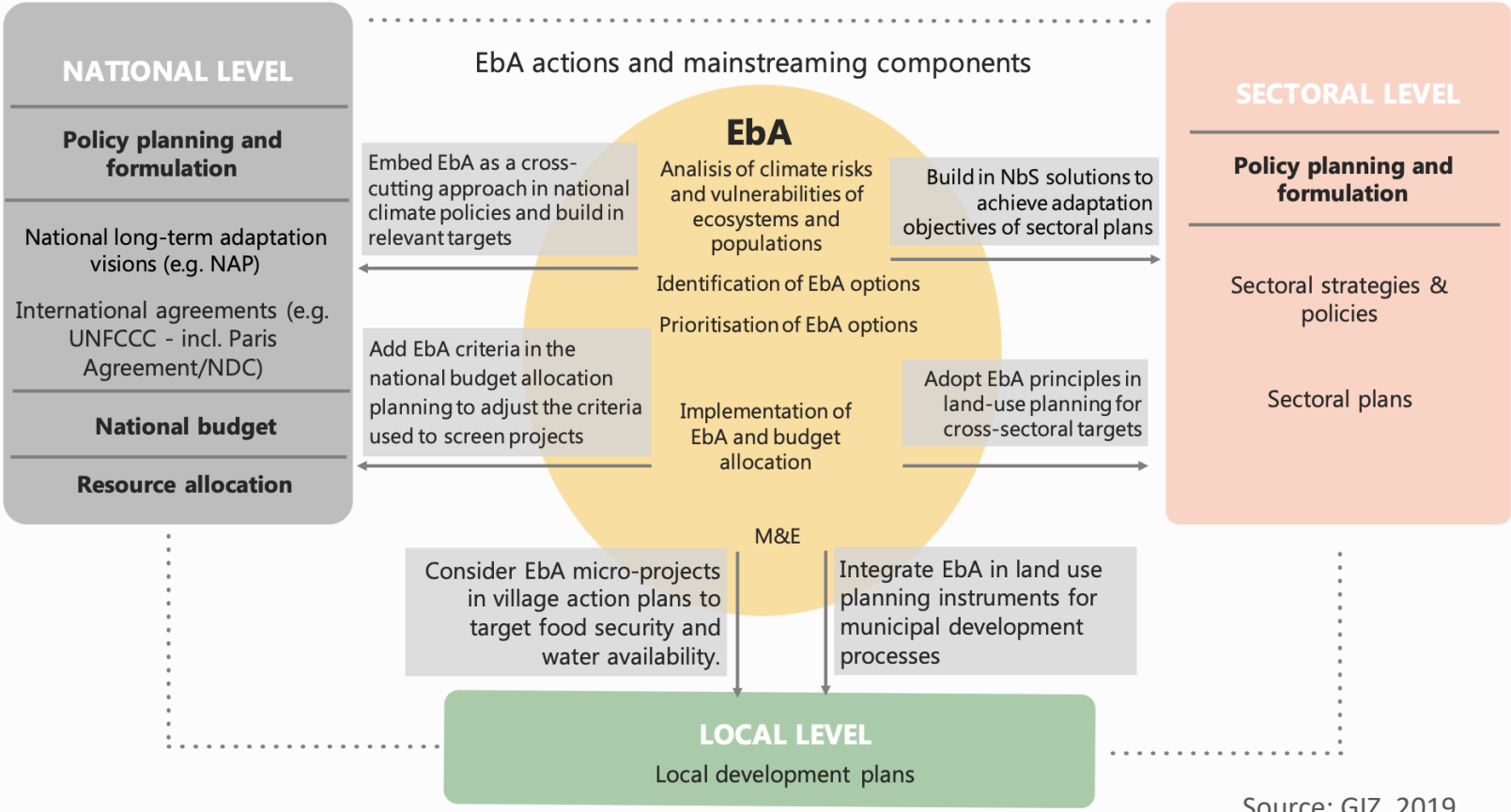
Where else to mainstream EbA?

The development or revision of policies and plans, e.g. development or sectoral plans, NDC, NAP, national biodiversity strategies and action plans, strategic environmental assessments, land-use plans.

Command and control instruments, e.g. climate change and environmental laws, standards, and environmental impact assessments, and disaster risk management;

Economic and fiscal instruments, e.g. investment programmes, funds, subsidies, taxes

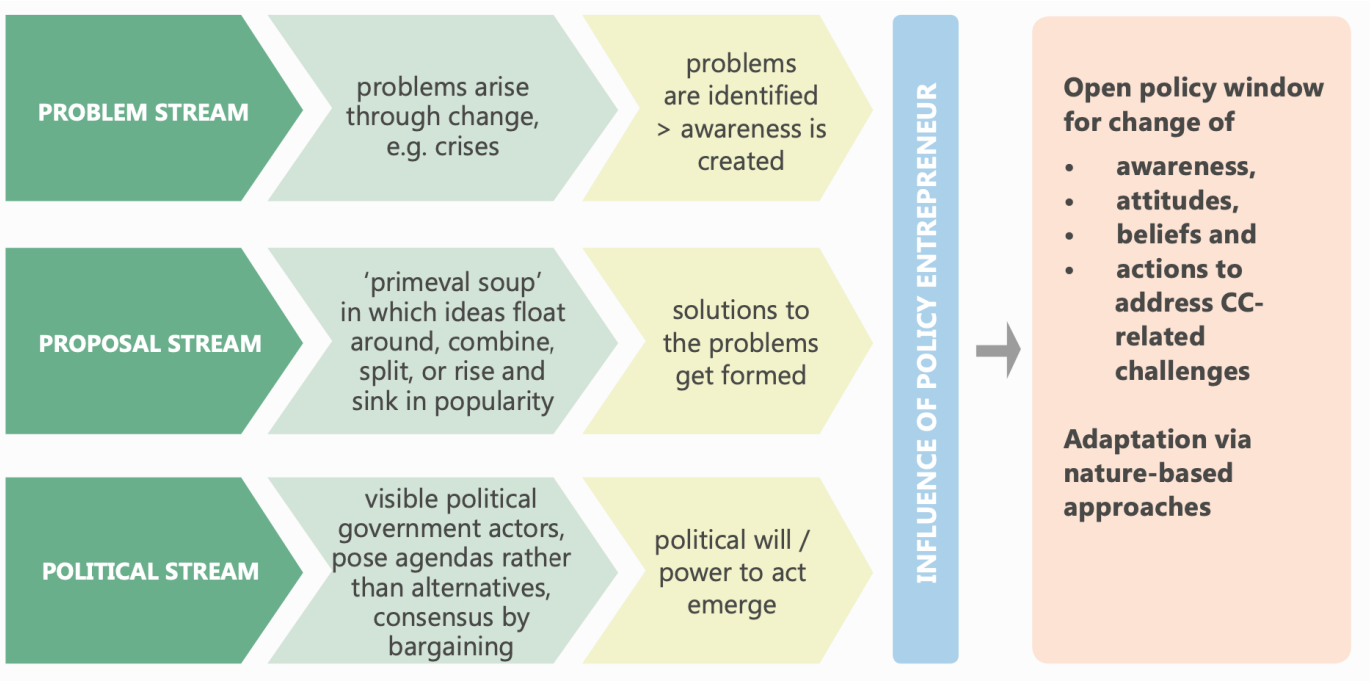
STRATEGIC ENTRY POINTS FOR EBA MAINSTREAMING



Source: GIZ, 2019

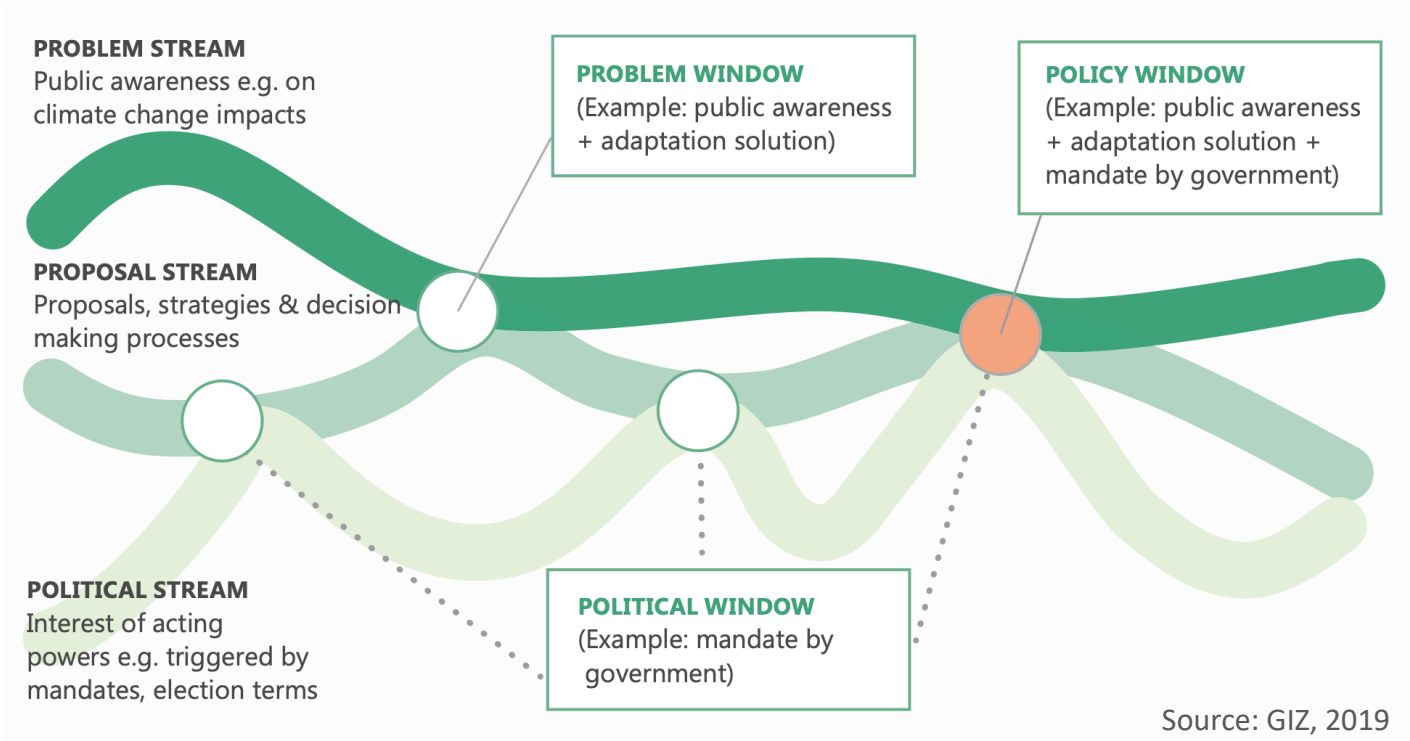
Examples of mainstreaming approach to EbA (1)

Creating a “window of opportunity” to mainstream EbA



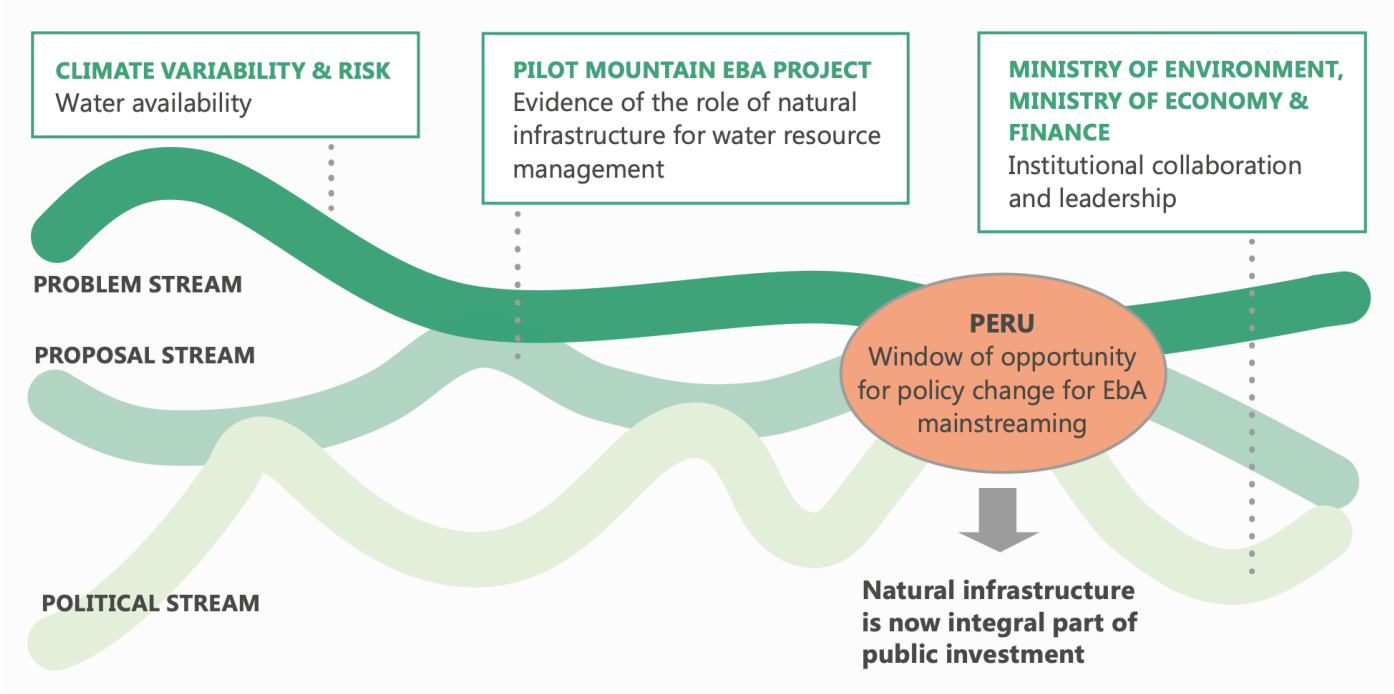
Source: GIZ, 2019

Examples of mainstreaming approach to EbA (2)



Source: GIZ, 2019

Case study: Peru



Source: GIZ, 2019

Key messages

EbA requires cross-sectoral coordination and stakeholder participation.

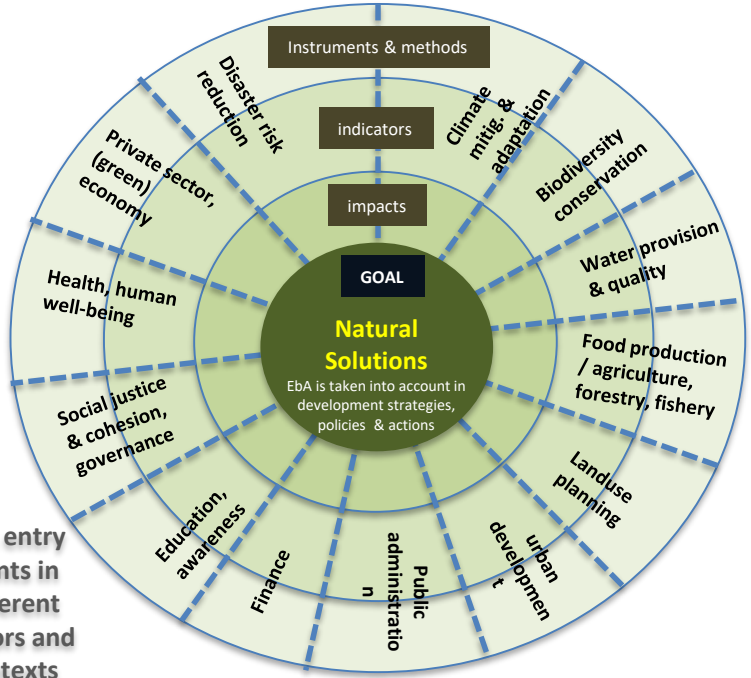
The process of mainstreaming EbA is not a recipe. Its aim is to provide a systematic approach to mainstreaming EbA in development planning.

EbA mainstreaming: Case studies

Entry points for EbA mainstreaming
GIZ, 2018

Country reports (South Africa, Philippines, Peru, Mexico)

Group work: Which sectors present opportunities for integrating EbA?



EbA entry points in different sectors and contexts

Source: GIZ-EbA (Amend, 2018)

- What national and subnational planning processes present opportunities for integrating EbA in Tanzania?
- What are the entry points for integrating EbA?
- Are there existing networks or working groups that bring together relevant actors where opportunities and barriers to EbA integration could be discussed?

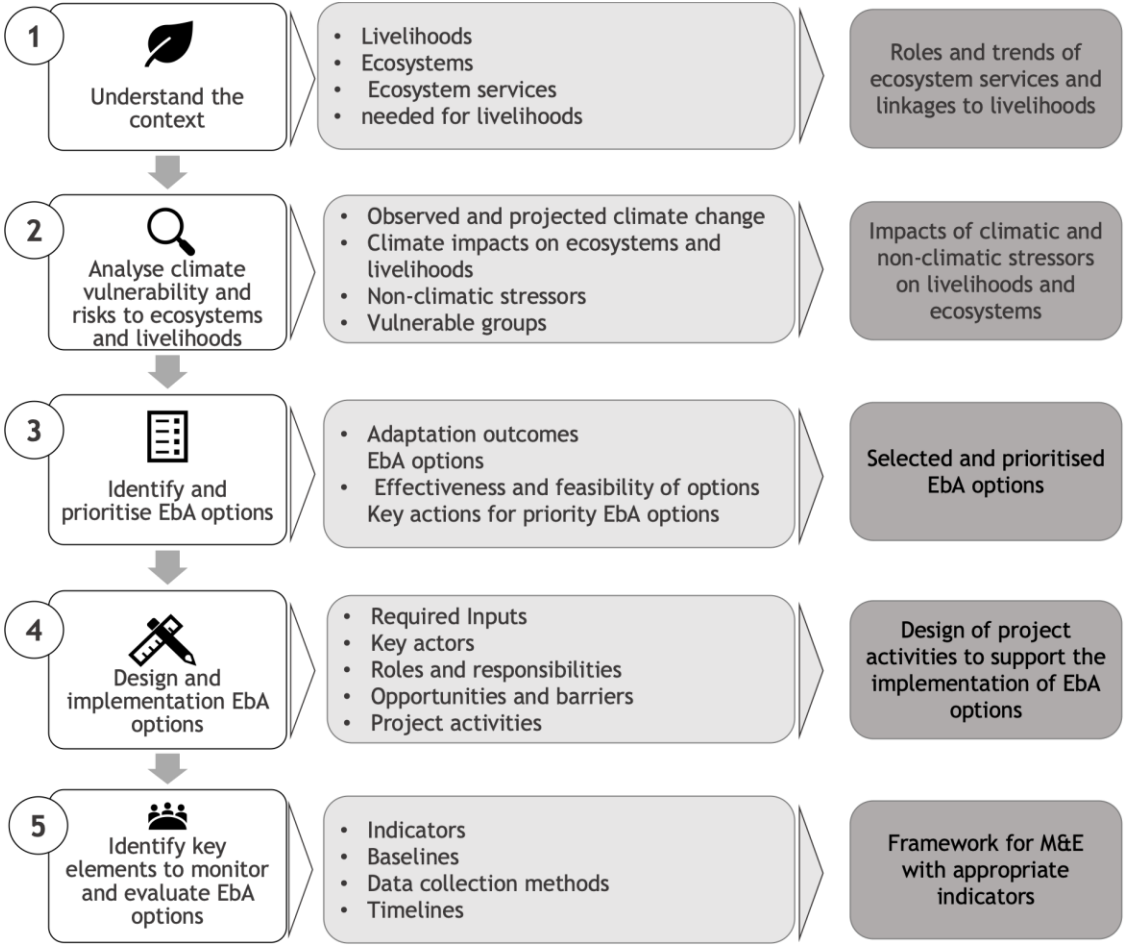
C. Stepwise approach to design and implement EbA

- General understanding of the planning process for EbA solutions
- Key aspects and principles for the design and implementation of effective EbA options

Planning and implementing EbA solutions

1. What is out baseline? – Ecosystems and livelihoods
2. What is the problem we want to solve? – Climate change risks and impacts
3. What are the solutions? –EbA solutions
4. How to design effective solutions? – EbA principles
5. How to monitor progress and identify lessons learned? – Monitoring and evaluation framework -> EbA specific indicators

Stepwise approach to design and implement EbA solutions



Key messages

EbA is a process, not a product, and should be integrated into policies, strategies and decision-making processes.

EbA is a cost-effective measure providing multiple social, economic and environmental co-benefits

Ecosystems support different sectors (agriculture, water, tourism) and therefore EbA is a cross sectoral approach.

Contact

Dr. Lili Ilieva

lili@ecoltdgroup.com