Implementing nature based solutions in transboundary basins

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CLIMATE CHANGE IMPACTS ON RIVER BASINS

Impacts of climate change on river basins

- Climate change is expected to change rainfall patterns, global temperatures, increase frequency of droughts and severe storms

- This will affect:
  - Quantity and quality of freshwater ecosystems
  - Groundwater recharge through changes in surface runoff and river flows
  - Health of estuaries and coastal wetlands though modification of river flows

Impacts of climate change on ecosystem services

- In some regions, climate change is likely to result in severe **loss of species**
- Changes in flow regimes have the potential to **disturb coastal ecosystems** (estuaries, wetlands, and related marine environment)
- When vegetation is cleared, soil retention of water is weakened, **exposing communities to flooding**

Climate change, ecosystems and livelihoods

Photo: Greengeeks.

- Many **cities** are exposed to hazards such as **landslides, floods, and coastal storms**
- Weakened ecosystems **increase** human vulnerability to climate change

Nature based Solutions (NbS)

Nature-based Solutions van be defined as:

*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*

(IUCN, 2016).

NbS: 3 main elements

NbS are actions to:

1) Protect, sustainably manage, and restore natural or modified ecosystems

2) Address societal challenges effectively and adaptively

3) Simultaneously provide human well-being and biodiversity benefits

NbS to address climate change

NbS imply the **use of nature and ecosystems services** for:

- **Mitigation** (e.g. reforestation to capture CO_2)
- **Adaptation** (e.g. protection or restoration of water springs to reduce risk of drought)
- **Disaster risk reduction** (e.g. conservation of wetlands for flood protection)

ECOSYSTEM BASED ADAPTATION IN TRANSBOUNDARY BASINS

Ecosystem-based Adaptation (I)

Ecosystem based adaptation can be defined as:

The use of biodiversity and ecosystem services *to help people* ***adapt*** *to the impacts of climate change*

(CBD, 2008)

Ecosystem-based Adaptation (II)

What services?

- **Provisioning services**: Goods and products obtained from ecosystems (e.g. freshwater, food, biological raw materials)
- **Regulating services**: Benefits obtained from ecosystems natural processes (e.g. water, climate, air quality, natural hazards)
- **Cultural services**: Non-material benefits obtained from ecosystems (e.g. recreation and ecotourism)

Ecosystem-based Adaptation (III)

What results?

- **Protection against impacts from extreme weather events**
- **Climate-resilient livelihoods**
- **Enhanced adaptive capacity** by providing alternative livelihood opportunities

EbA in transboundary basins

- Applying the EbA approach to IWRM in transboundary basins aims to:
  - Achieve sustainability and ecosystem conservation
  - Reduce human and ecosystems' vulnerabilities to climate change
  - Foster joint and cooperative actions to climate challenges in shared waters
  - Overcome lack of coordination and disjointed planning among sectors and borders

Overarching considerations for EbA in transboundary basins

1. Integrating knowledge, technologies, practices and efforts of indigenous peoples and local communities

2. Mainstreaming EbA into planning and decision-making processes from local to global policy levels

3. Raising awareness and building capacity

Develop EbA actions in transboundary basins

1. Define the intervention area and understand the socio-ecological system
2. **Identify a proper/trusted platform** with representation of riparian communities **(e.g. RBO's)**
3. Assess vulnerabilities & climate change risks
4. Identify EbA and Eco-DRR options
5. Prioritize, appraise and select options
6. Design a project and implement it
7. Monitor and evaluate (encourage continuous learning to help inform future policies and practice)

EbA in transboundary basins: entry points

- Development of regional /basin adaptation programmes that incorporate EbA
- Mainstreaming E-flows considerations in adaptation policy, legal and institutional frameworks
- Incorporation of EbA in the development of tranbsoundary water strategies and plans

EXPERIENCES

Goascorán basin: vulnerabilities

- Exposure to climate impacts: higher temperatures and droughts
- Higher sensibility relating to non-climate factors: unsustainable waste management affecting water quality
- No binational agreement between riparians and no harmonized national legal frameworks

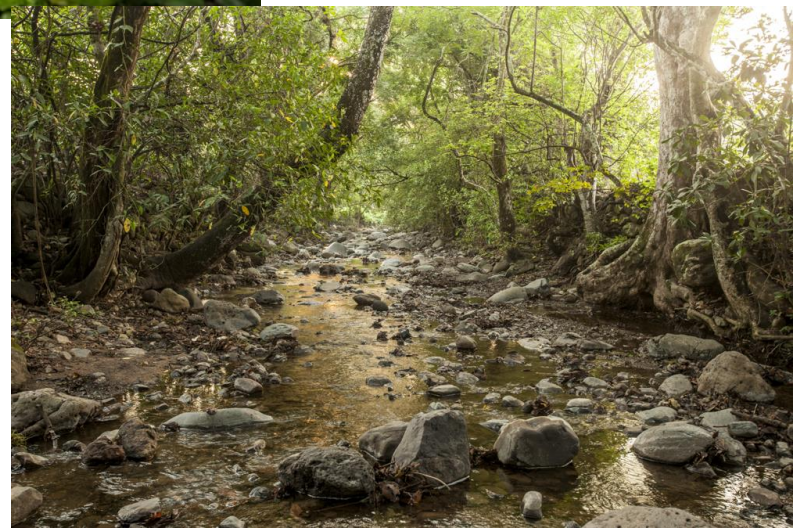
Goascorán basin: actions

Strengthened governance capacities of local water organizations
Building capacities for effective dialogues (i.e communication skills) and knowledge on EbA
Coordinating existing local organization for transboundary water cooperation a) Honduras: Goascorán Basin Council b) El Salvador: Mesas Técnicas Ambientales
Gathering evidence on EbA benefits to address social challenges
Incorporating EbA in basin management processes

Implementation of EbA measures:

- Agroforestry systems in micro-basins
- Restoration of springs
- Tree nurseries

Goascorán basin: results



Sustainable use and management of ecosystem services

- 31 ha of degraded forests restored
- 5000 families have increased their water security due to springs restoration
- Economic diversification due to agroforestry systems
- Reduction of illegal logging

People's adaptive capacity

- >200 people have a better understanding of climate change, water governance and EbA
- M&E tools on EbA benefits for water and food security available

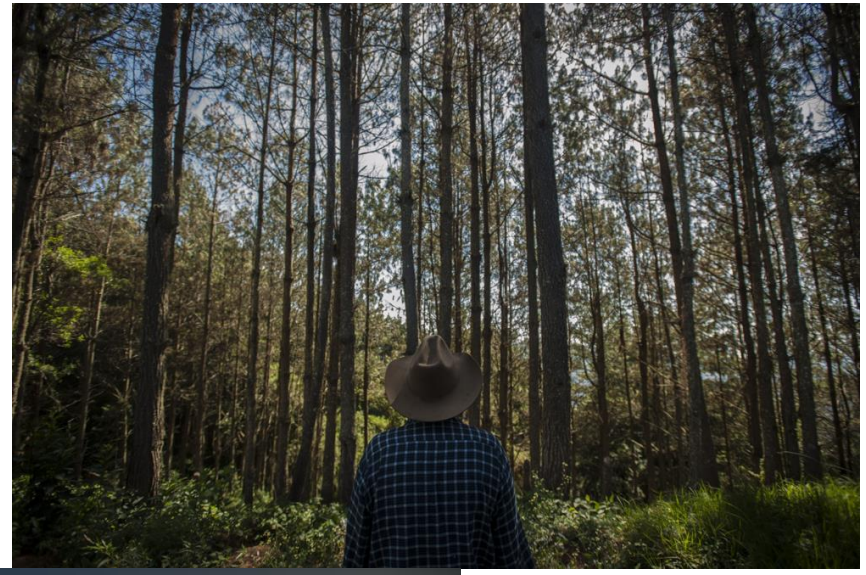
Upper Sumpul sub-basin: vulnerabilities

- **Exposure to climate impacts**: increased storms, droughts, and floods
- **Higher sensibility due to non-climate factors**: water pollution and deforestation
- **Lower adaptive capacity associated to governance factors**: historical conflicts between water users

Upper Sumpul sub-basin: actions

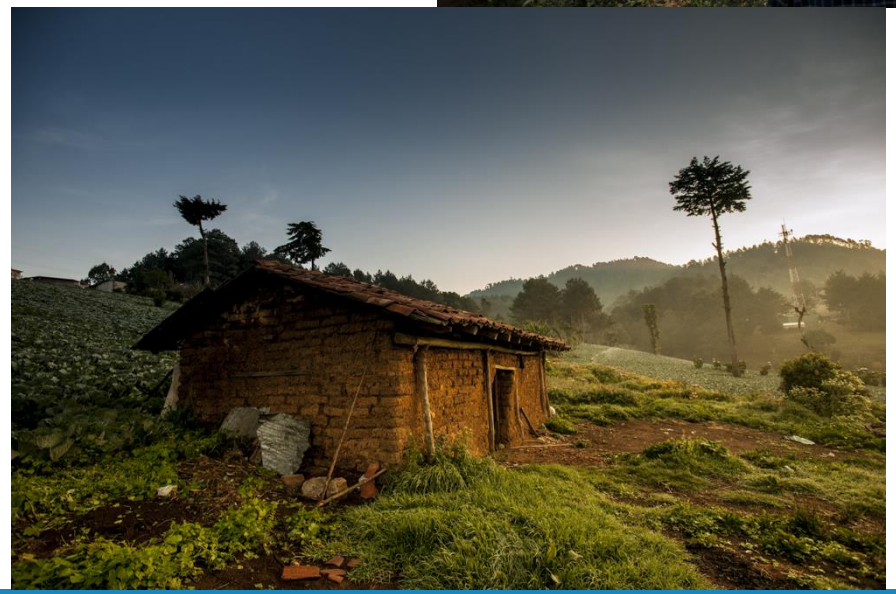
Strengthened governance capacities of local water organizations
Building **trust** through community led vulnerability assessments
Strengthening capacities for effective multi-stakeholder dialogues
Revitalizing a Binational Committee
Gathering evidence of EbA benefits to address social challenges
Fostering incorporation of EbA in basin management

Upper Sumpul sub-basin: results



Sustainable use and management of ecosystem services

- 50 ha sustainably managed through agroforestry systems
- 5 springs restored
- 50 family farms diversified crops
- Recovery of vegetation cover in the basin



People's adaptive capacity

- 100 families have a better understanding of climate change, water governance, and EbA
- Water boards and Binational Committee gained increased capacities to implement EbA measures

Lessons learned

- **Ecosystem services** are a critical part of the solution to water scarcity
- **Improved water governance** underpins actions for adaptation to climate change
- **RBO's are key actors for EbA** integration in basin management as they acts as **platforms** for assessing vulnerabilities, defining actions and implementing them.
- **Community-based vulnerability assessments** enhance cooperation and build trust among stakeholders
- **EbA successful on-the-ground experiences** contribute to EbA incorporation into National Adaptation Plans
- EbA actions contribute to attaining SDG's and NDC's commitments

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