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Training on Ecosystem-based Adaptation (EbA)

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

ECO.

DEEPER
THINKING

19 December 2019

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Co-trainers:

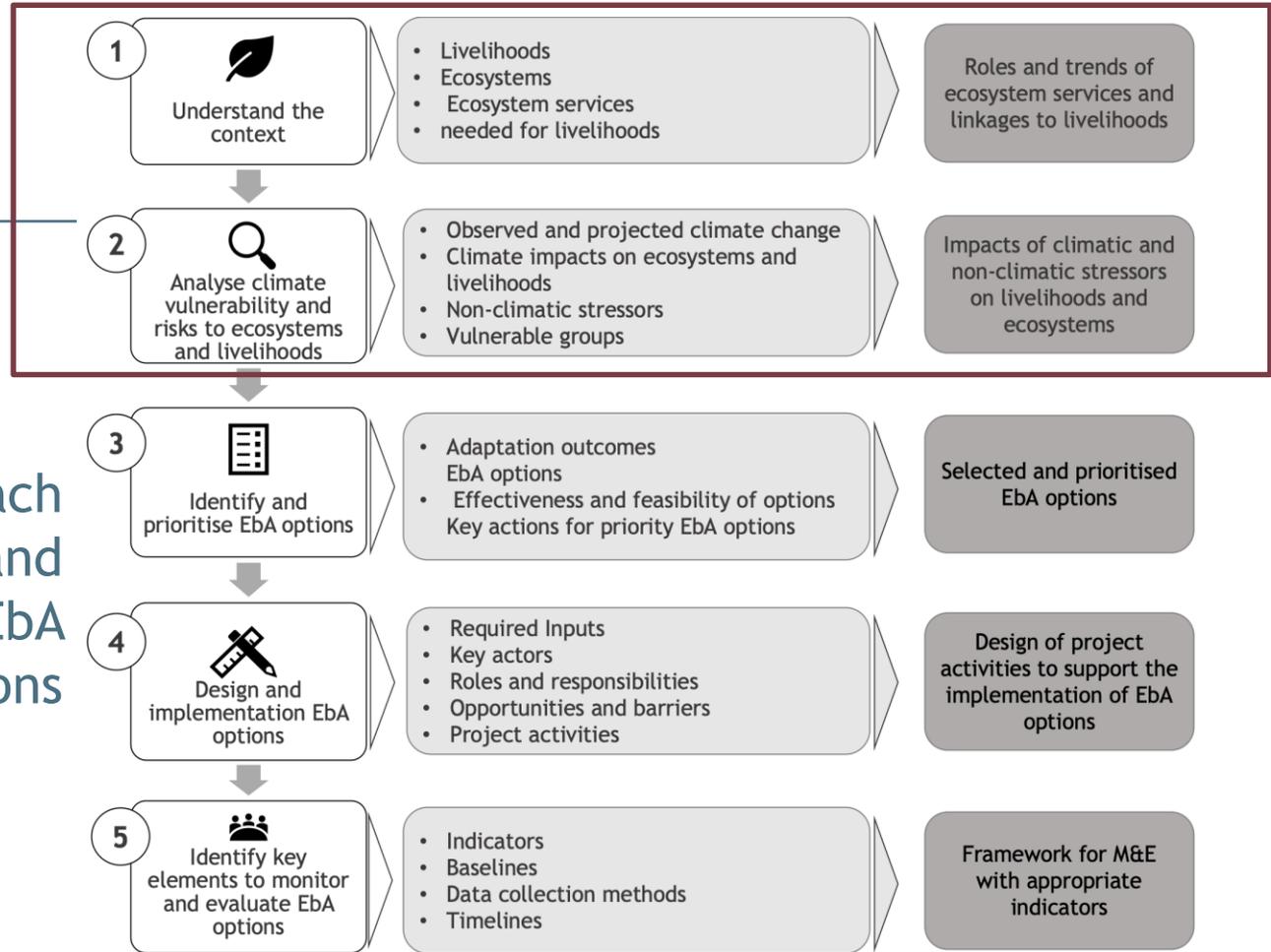
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MODULE 2. ANALYZE CLIMATE VULNERABILITY AND RISKS TO ECOSYSTEMS AND PEOPLE

- A. Understand the socio-ecological context
- B. Analyze climate vulnerability and risk

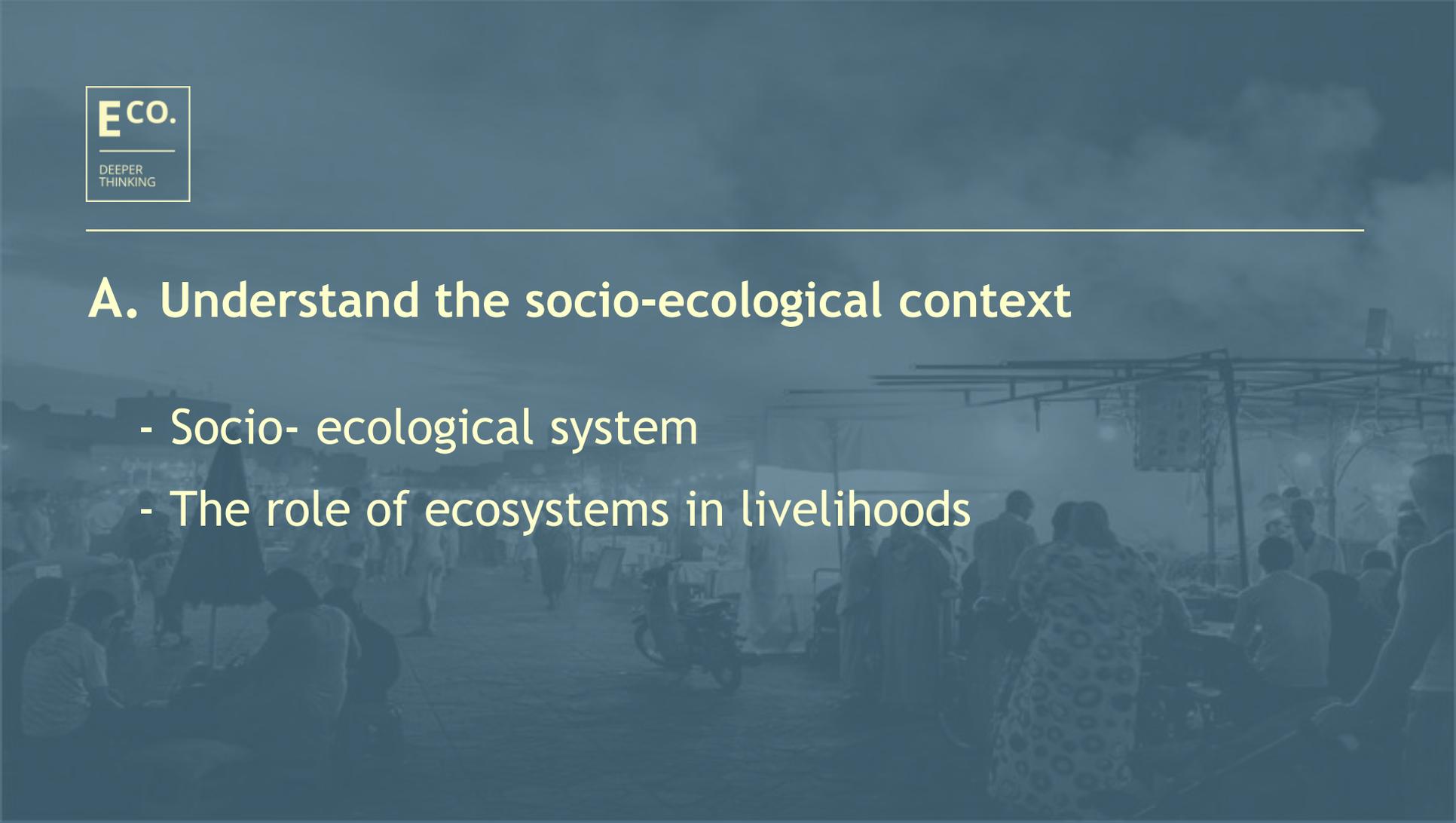
Stepwise approach to design and implement EbA solutions



Learning outcomes

- Become familiar with socio-ecological systems
- Become familiar with definitions related to vulnerability and risk.
- Acquire an overview of available methods and tools, as well as criteria for choosing methods appropriate to the context.
- Learn from practical examples in the Tanzania context.
- Practice identifying vulnerabilities and risks (case work).
- Being able to assess the context for adaptation.

A. Understand the socio-ecological context

- Socio- ecological system
 - The role of ecosystems in livelihoods
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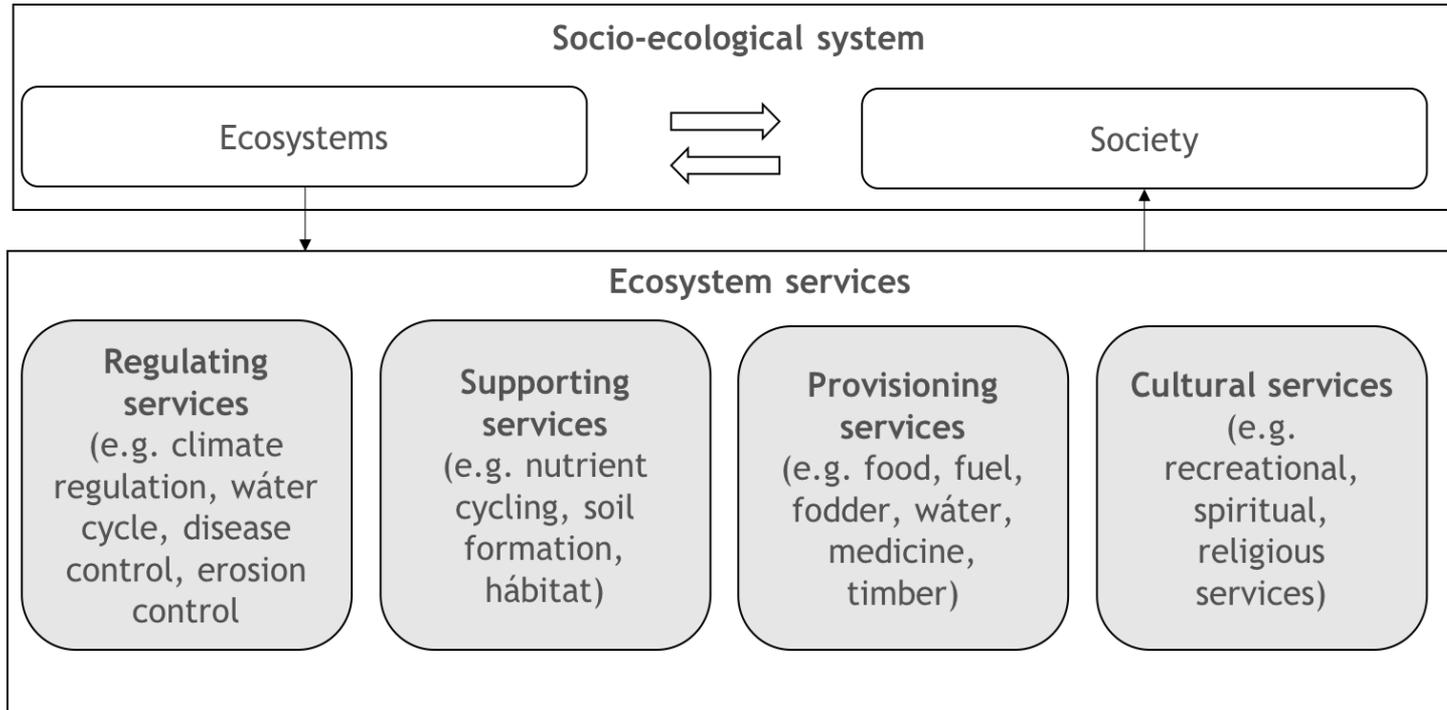
Objectives and activities



Objective: To understand the state of ecosystem services and their importance of the livelihoods of communities /sectors.

Activities: Identify the characteristics of the ecosystems, their services and good. Identify the livelihoods of the communities.

What is a socio-ecological system?





What is the socio-ecological context of the project site?

It is essential to identify the livelihood groups in the project site and what is the role of ecosystem services in supporting their livelihoods and well-being. Examples of ecosystem services for adaptation:

- Flood protection
- Landslide prevention
- Erosion protection
- Drought protection

B. Analyze climate vulnerability and risk

- Definitions about vulnerability, risk, adaptation
- Analysis of climate risk
- Climate impact pathway

Objectives and activities

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Analyse climate vulnerability and risks to ecosystems and livelihoods

- Observed and projected climate change
- Climate impacts on ecosystems and livelihoods
- Non-climatic stressors
- Vulnerable groups

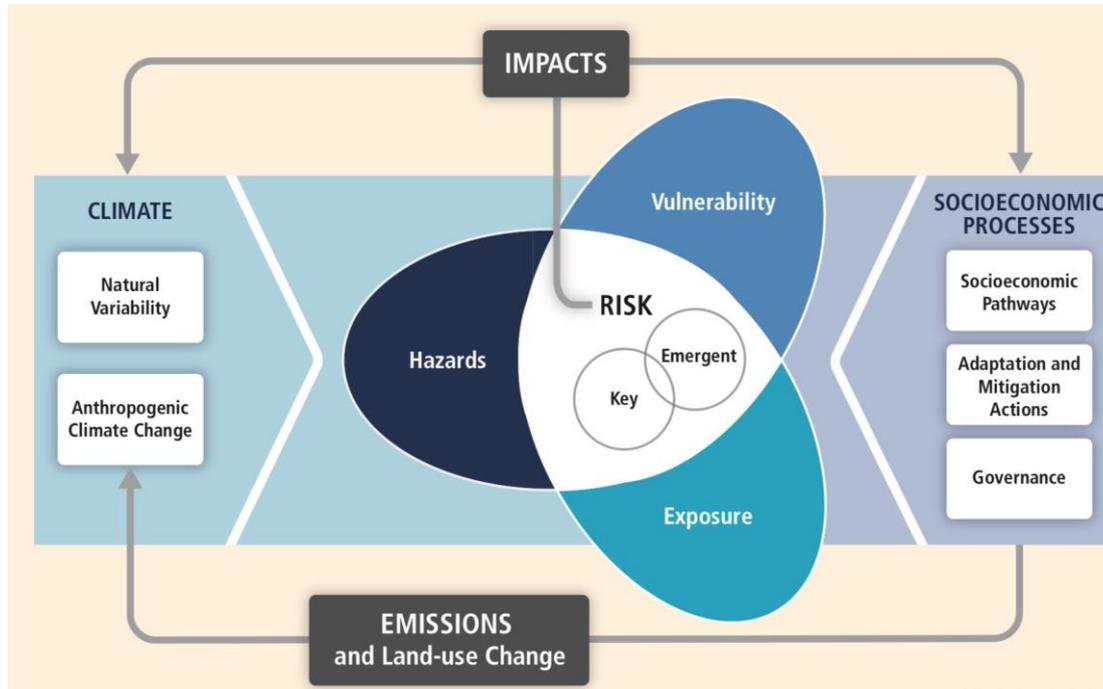
Impacts of climatic and non-climatic stressors on livelihoods and ecosystems

Objective: Evaluate the factors that contribute to vulnerability and risks in the system in order to understand where adaptation is most relevant.

Importance: Establish the basis for the development of solutions - a consensus about the identification of problems.

Activities: Identify possible climate impacts on the ecosystem and its services. Analyze the possible effects and risks, emphasizing how services are affected.

Climate change risk and vulnerability



Exposure: The presence of people, livelihoods, species or ecosystems, infrastructure, or economic, social, or cultural assets in places and settings that could be affected.

Vulnerability: The predisposition to be adversely affected. It is composed by sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

Hazard: The potential occurrence of a climate-related physical events that may cause loss of life, injury, loss to property, infrastructure, livelihoods, ecosystems.

What is a climate hazard?

Hazard: The potential occurrence of a climate-related physical events that may cause loss of life, injury, loss to property, infrastructure, livelihoods, ecosystems.



Hydrological hazards: flood, landslide

Meteorological hazards: storm, cyclone, extreme temperature

Climatological hazards: drought, wildfire

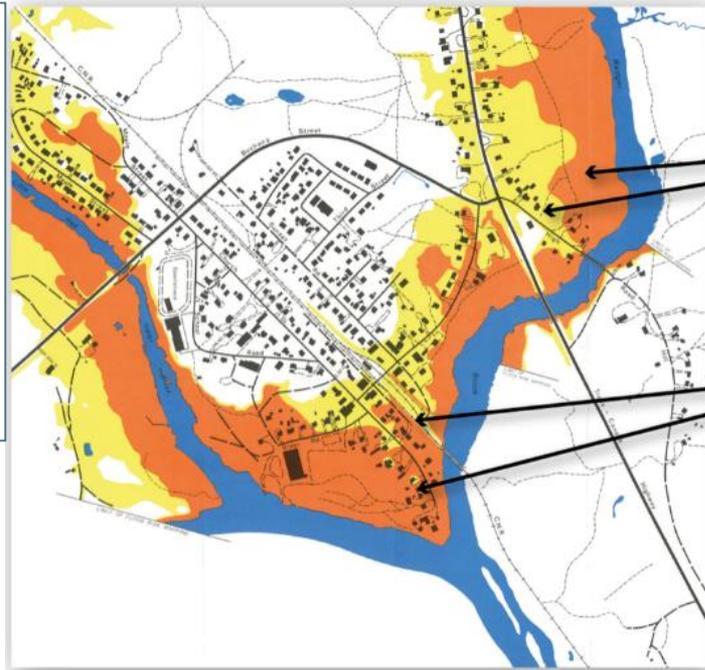


What is exposure to climate hazards?

Exposure: The presence of people, livelihoods, species or ecosystems, infrastructure, or economic, social, or cultural assets in places and settings that could be affected.

Exposure of:

- Community, city, or region
- Natural resources
- Infrastructure or property



Excerpt of flood information map of the Town of St. John's
(c) Newfoundland and Labrador Department of Municipal Affairs and Environment - Water Resources Management Division

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What is vulnerability to climate change?

Vulnerability: The predisposition to be adversely affected. It is composed by sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

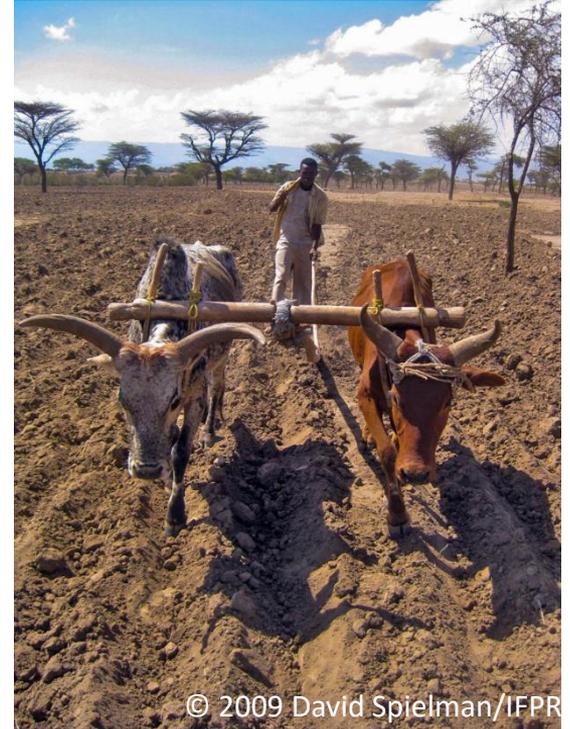
Vulnerability is inherently dynamic: Changes over time as interactions between climate-related hazards and socio-economic system change.

Current vulnerability
to climate stressors

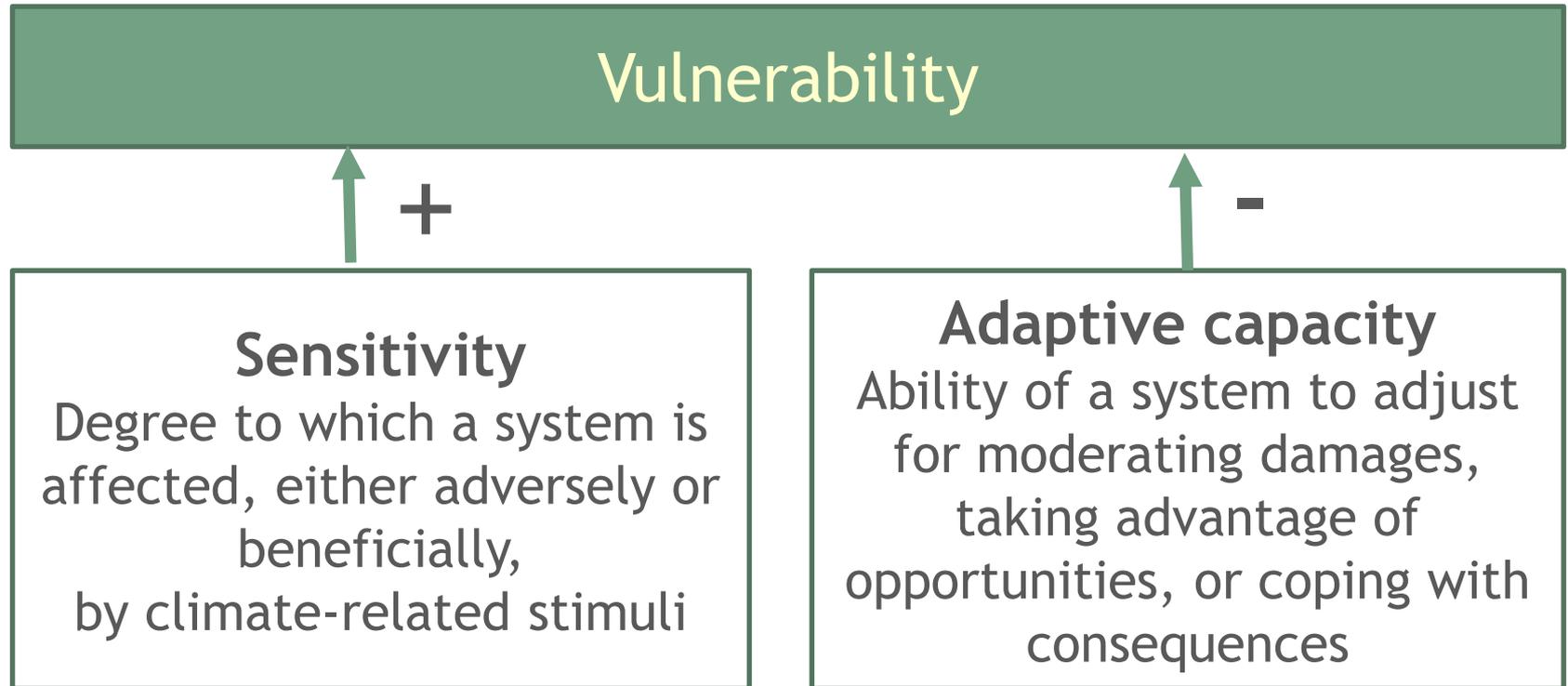


Future vulnerability
to climate change

**Differential vulnerability -
Gender aspects**



What characterises climate vulnerability?



Examples:

- High dependency of farmers on rain-fed agricultural production.
- Degraded ecosystem, which supports livelihoods such as agriculture and livestock.



Adaptive capacity

Factors defining adaptive capacity:

Financial - lack of savings or access to credit

Physical - lack of protective infrastructure, adequate housing or inaccessible shelter

Social / human - lack of disaster awareness or lack of a support network due to marginalization or discrimination

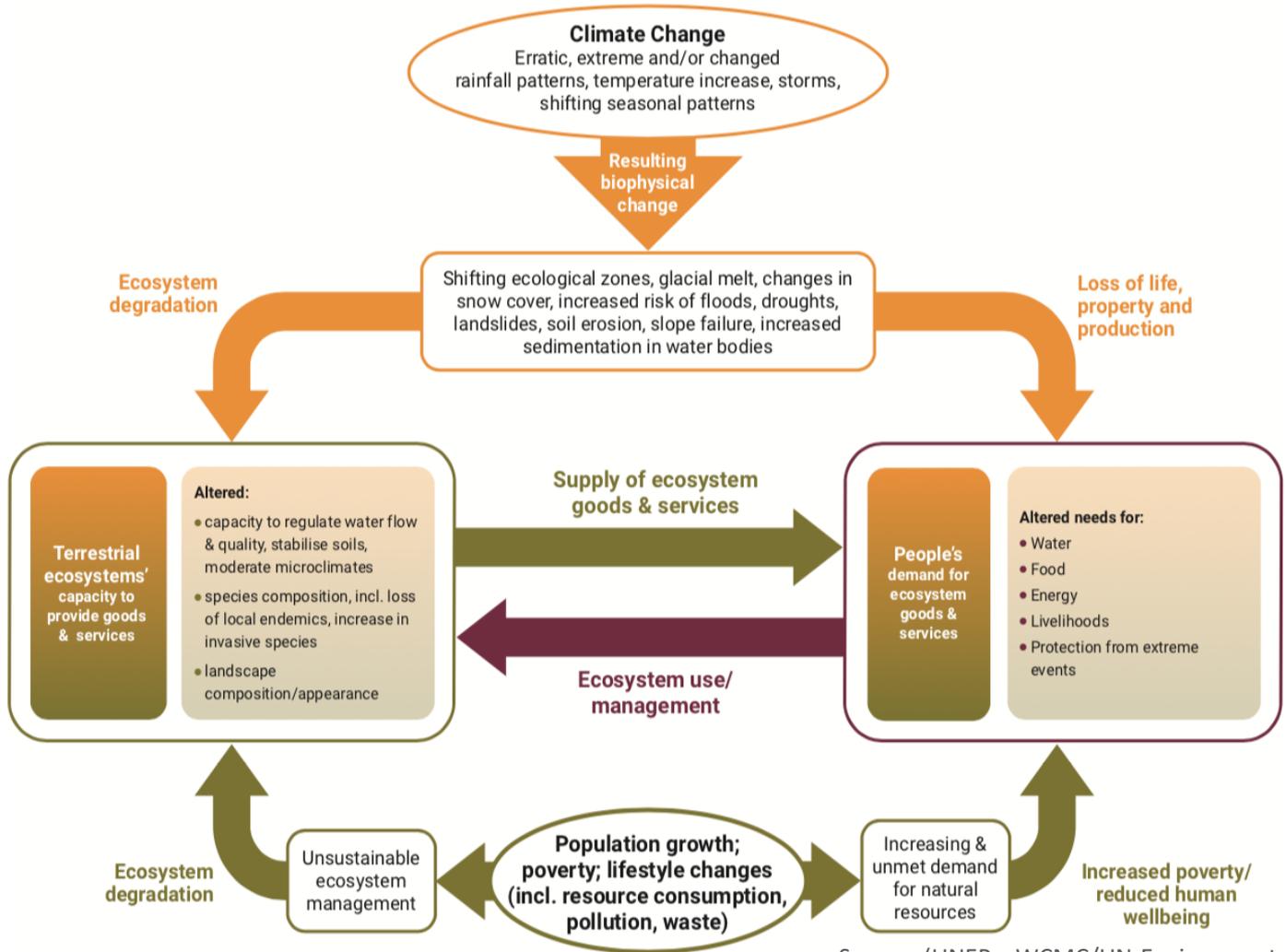


Vulnerability of ecosystems



- Ecosystems are threatened by various human-induced pressures other than climate change - **This makes the ecosystem sensitive to climate changes**
- Other pressures include land use change, landscape fragmentation, degradation of habitats, over extraction of resources, invasive species
- Climate change will increase these pressures over the coming decades

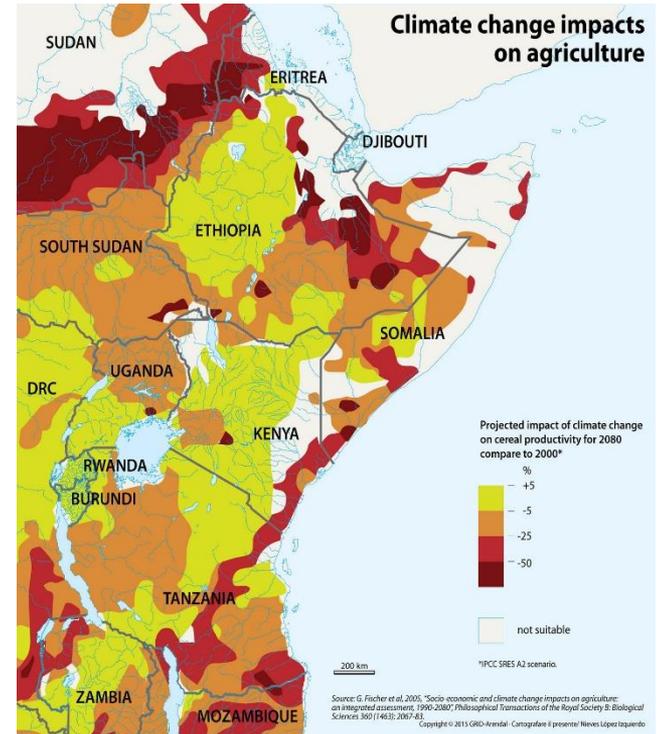
Interactions of climatic and non-climatic degradation processes in terrestrial ecosystems



Climate risks and impacts

Climate impacts = the effects on natural and human systems of extreme weather and climate events and of climate change. due to the interaction of climate changes or **hazardous climate events** occurring within a specific time period and the **vulnerability** of an **exposed** society or system. (IPCC, 2014).

Risk = The potential for consequences [= impacts] where something of **value** is at stake and where the outcome is **uncertain**.



Why assess vulnerability?

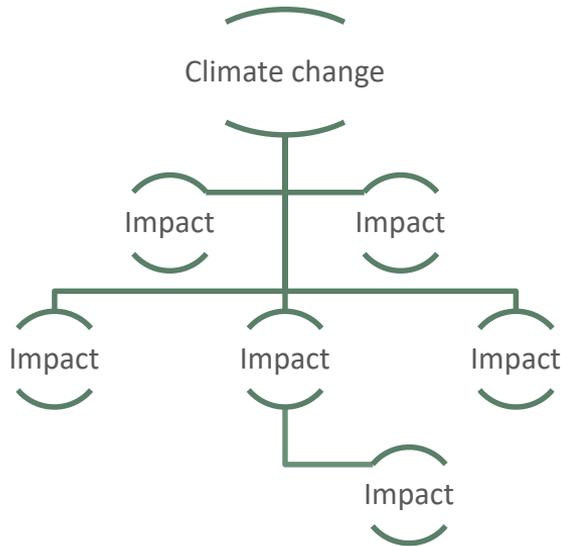
- Vulnerability assessment are important input for adaptation planning and help to identify where adaptation action is most appropriate.
- Vulnerability may be identified at:
 - Different levels (e. g. national/local level)
 - Different sectors (e.g. Agriculture, forestry, water)
 - Different population groups (e.g. women, children, farmers)

Why assess climate risks?

Risk analysis provides knowledge of the risk and its factors in order to inform the design of solutions. It is a methodology that will allow the causal analysis of the risk to identify the factors that generate it (hazards, exposure, vulnerability) as well as its effects on the socio-ecological system

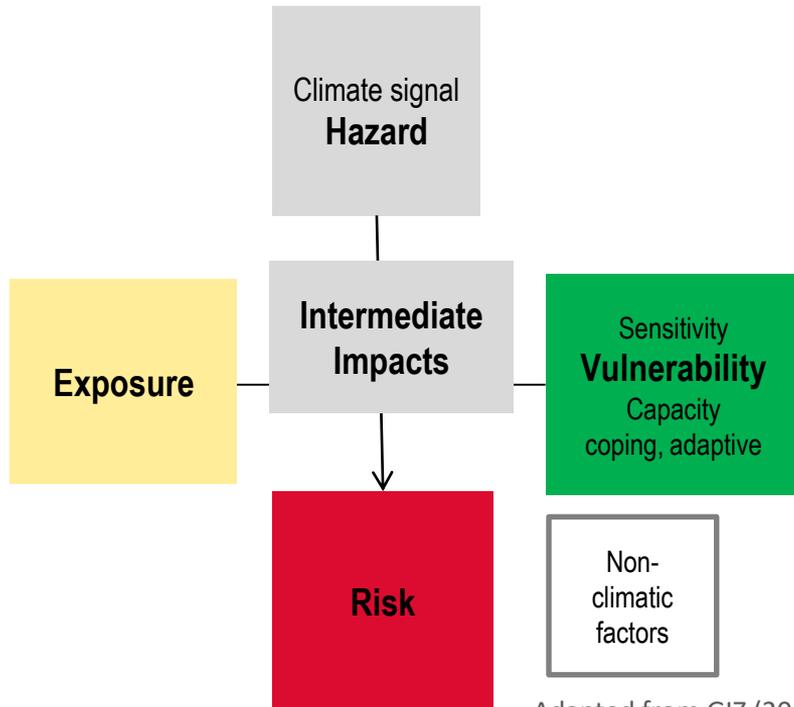


Climate impact pathway: What is and how to use it?



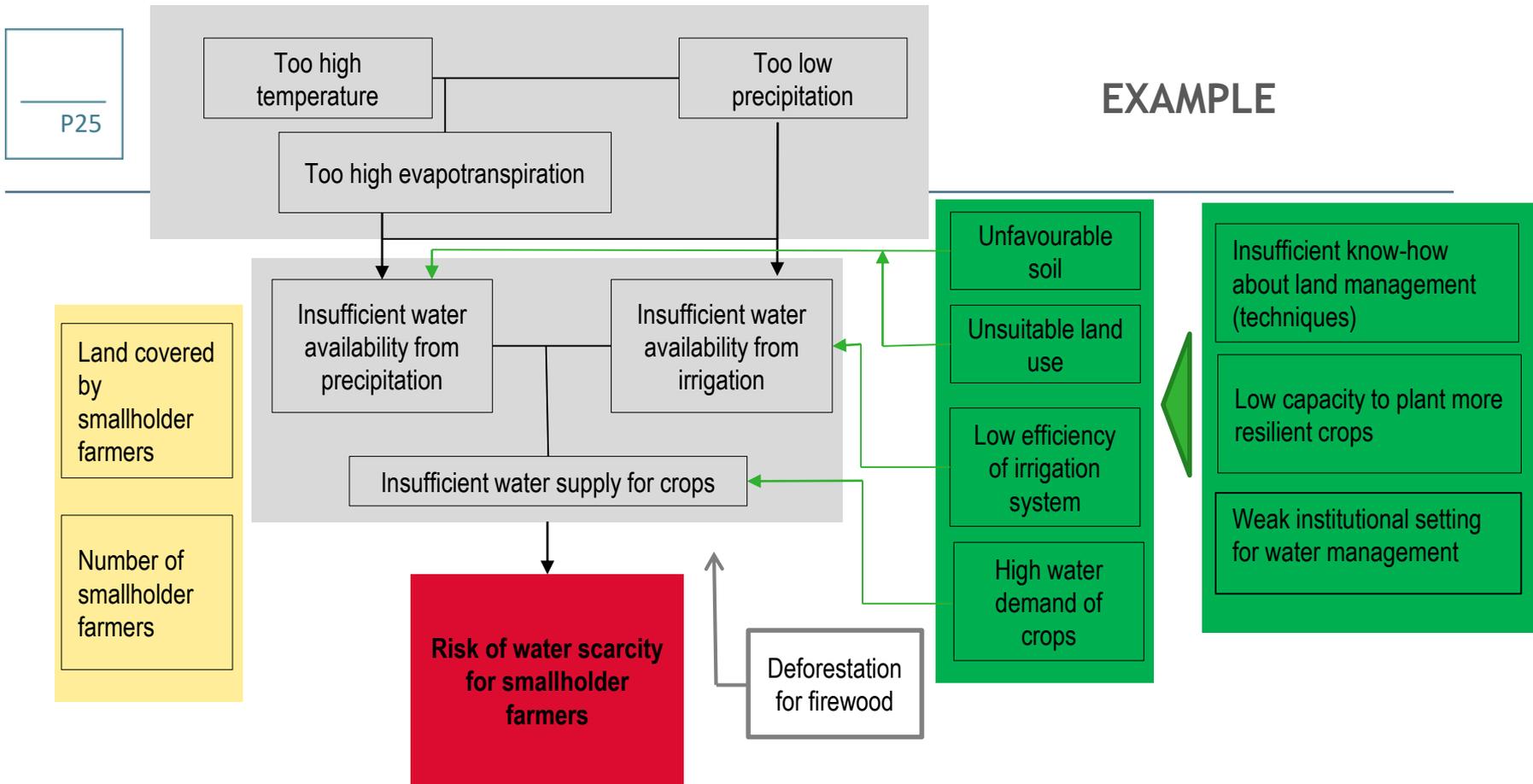
- An analytical tool that helps to better understand and prioritise the factors that drive risk for the population and the key economic sectors in your country.
- Serves as guidelines in developing a comprehensive narrative for the climate profile of your country.
- Provides decision-makers with a first indication of where climate impacts may be felt earliest, and where interventions might be needed
- Helps identify effective adaptation solutions that address the specific impacts and vulnerability factors.

Steps in developing a climate impact pathway

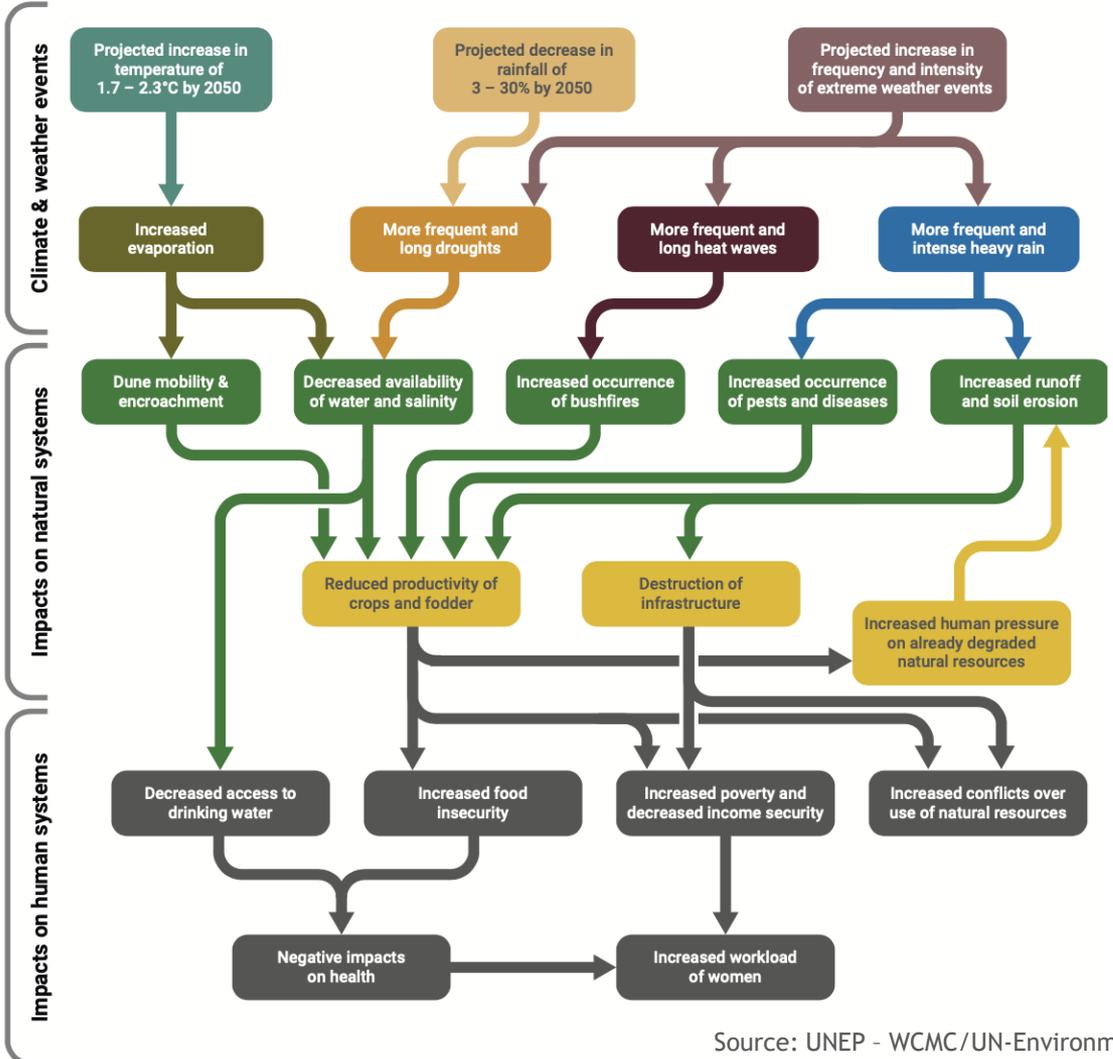


Adapted from GIZ (2017)

- 1A. What are the main historical climatic trends and future scenarios relevant for the country/region?
- 1B. **Identify the risks:** What are the risks that are to be addressed by the project?
- 1C. **Determine hazards and identify intermediate impacts:** What are the impacts of climatic change on people/ecosystems/ livelihoods?
- 1D. **Determine vulnerability:** What aspects of climate vulnerability will be targeted by the project?
- 1E. **Define the non-climatic factors:** What are the non-climatic drivers (root causes) of change that exacerbate climate impacts?



Climate impacts pathway



What is adaptation to climate change?

Adaptation is an adjustment in natural and humans systems in response to actual or expected climate stimuli and their effects, which may cause harm or generate beneficial opportunities.” Perry, et al. 2007 (IPCC)

Adaptation refers:

- Actions taken to prepare for and cope with climate change
- Decreases the vulnerability of ecosystems and people to climate change



GROUP WORK

Analysis of climate vulnerability and risks to ecosystems and livelihoods

The background of the slide is a faded, blue-tinted photograph of a busy outdoor market. Numerous people are seen walking, standing, and interacting. There are various stalls and structures, including a motorcycle parked in the middle ground. The overall atmosphere is one of a bustling, active community space.

- Time for the exercise: **10 min**
- Read the case study and discuss it
- Is there something more that you know about the case study?
- Each group requires:
 - One person to present the results "Reporter"
 - One person to note down the results in the ALivE tool

Task 1: UNDERSTAND THE SOCIO-ECOLOGICAL CONTEXT

Time for the exercise: 45 min

Please see ALivE tool (pages 21 - 27) and perform the following steps:

1. Describe the livelihood context in the study area
2. Assess livelihood dependence on ecosystem services
3. Describe the major ecosystems in the study area
4. Identify ecosystems needed for livelihood activities
5. Identify how ecosystems reduce impacts from natural hazards

Task 2: ASSESS CLIMATE VULNERABILITY AND RISK FOR ECOSYSTEMS AND LIVELIHOODS

Time for the exercise: 50 min

Please see ALivE tool (pages 29 - 36) and perform the following steps:

1. Document observed and projected climate change in the study area
2. Assess impacts of climate change on ecosystems important for livelihoods
3. Analyse impacts of climate change on ecosystems important for livelihoods
4. Assess impacts of non-climatic stressors on ecosystems
5. Analyse impacts of climatic and non-climatic stressors on livelihoods
6. Identify social groups that are particularly vulnerable



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