THE ECONOMICS OF LAND DEGRADATION

ELD CAMPUS

Module: Steps of an ELD study

In this module you will learn about:

- *the theoretical framework behind the approach;*
- *the difference between a usual and an economic total value cost-benefit analysis; and*
- *the step-wise (6+1) approach of ELD.*

This module is directly linked with the module on communication, outreach and policy impact, since stakeholder implication in the process is crucial.

Further information on the ELD approach is provided in the script; links are provided at the end of this presentation.

ELD studies…

- usually apply **cost-benefit analysis (CBA)**;
- define a **period of time** for the analysis;
- look at a **clearly determined geographic area** ("degradation hotspot");
- define an (restoration/improvement) **objective**;
- **involve all stakeholders**;
- **analyse a (set) of activities** ("investments") leading to the achievement of the objective, maybe comparing different options to identify the best set of interventions

→ "project approach" (CBAs look into efficiency)

ELD studies…

compare at least **two scenarios**

"business as usual (BAU)" ⟺ "investment into SLM"

- In a non-sustainable production system; the BAU will show a downward trend;
- Sustainable land management (SLM) investments will first lead to a decrease in net returns (because of upfront direct costs or necessary changes in cropping patterns leading to a loss of production area);
- at a certain time however, the net returns from the investments will begin to exceed the returns of the BAU scenario.

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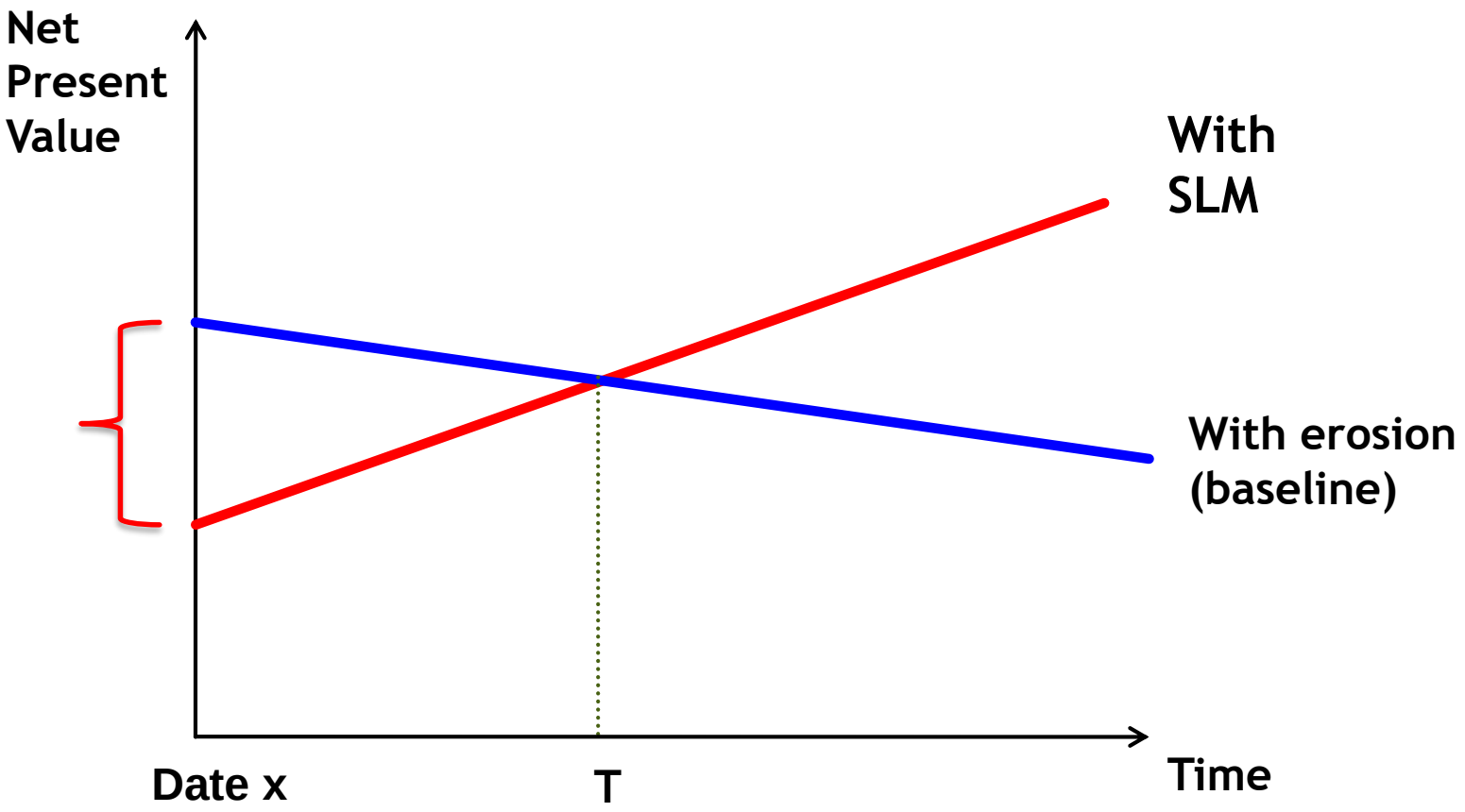
ELD theoretical framework



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Cost-benefit analysis…

- looks into the additional revenues gained from an investment

(net revenue= revenue-costs)

	Year 1	2	3	4
Additional revenues (+)	$	$$$	$$$	$$$$
Additional operating and investment costs (-)	$$$	$$	$$	$
Additional net revenue (balance)	- $$	$	$	$$$

- The analysis of financial flows shows, whether constraints exist (negative cash flow at the start)

Examples for cost-intensive investments, small-scale farmers are likely not to burden:

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Total value cost-benefit analysis

- ELD furthermore **integrates all benefits from ecosystem services** into the cost-benefit analysis
- Instead of revenues, the term “benefits” is used in a “total value CBA”

	Year 1	2	3	4
Additional benefits (+) **including crops, fire wood, honey, agro-tourism, fodder, avoided damages, etc.**				
Additional operating and investment costs (-) **including all supplies for SLM investments (costs for water, labour, seeds, rent, etc.)**				
Additional net revenue (balance)				

You can find more information on CBA in the respective module!

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ELD studies…

- can therefore inform the policy sector on the economic benefits from investments into SLM;
- at the same time, referring to the financial analysis, they can show the need for supporting farmers to overcome financial constraints in the first year(s).

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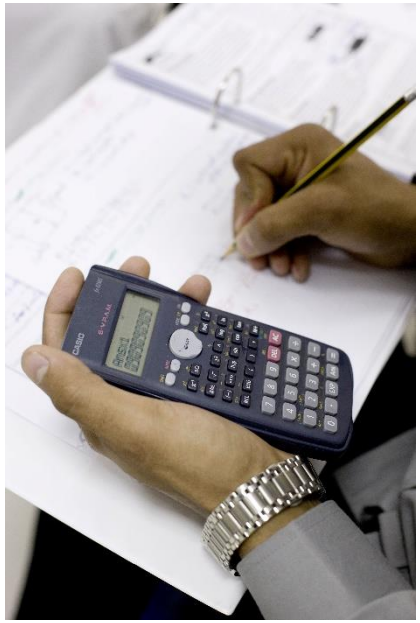

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ELD‘s 6+1 step approach

1. ***Inception***
2. ***Geographical characteristics***
3. ***Types of ecosystem services***
4. ***Role of ecosystem services and economic valuation***
5. ***Patterns and pressures***
6. ***Cost-benefit analysis and decision-making***

+1 step: ***Take action!***

Step 1 - Inception

Identification of the ***scope, location, spatial scale, and strategic focus of the study***

- This step is based on stakeholder consultations
- The objective of the study is determined together
- Background materials on the context of the study area are analysed (policies, laws, institutions as well as the socio-economic, cultural and environmental context)

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Step 1 - Inception

- Note that it is of utmost importance **to involve policy-makers** into this step, in order to ensure their buy-in and interest for the study from the onset!
- ELD studies can be undertaken at different scales. It is crucial to **determine the right scale.**
- In order to develop sound scenarios, the **drivers of degradation** and suitable **investment / transformation options** need to be **identified**.

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Step 2 – Geographical characteristics

*Identification and analysis of **agro-ecological zones***

- Establishment of the geographic and ecological **boundaries** of the study area
- Assessment of quantity, spatial distribution, and ecological characteristics of **land cover types**, key variables being:

  - land cover
  - altitude
  - topography
  - climate/precipitation
  - soils
  - vegetation

- Identification of land cover categories, which are then grouped into **agro-ecological zones**

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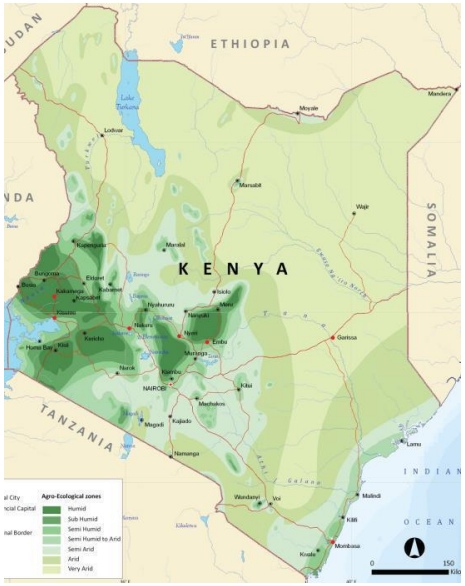
Step 2 – Geographical characteristics

- Note that the use of a **geographical information system** (GIS) can facilitate this step
- If the study is at a large scale, remote sensing data will be the basic data source
- On a more local level, information collected at the ground will play a larger role (participatory GIS)

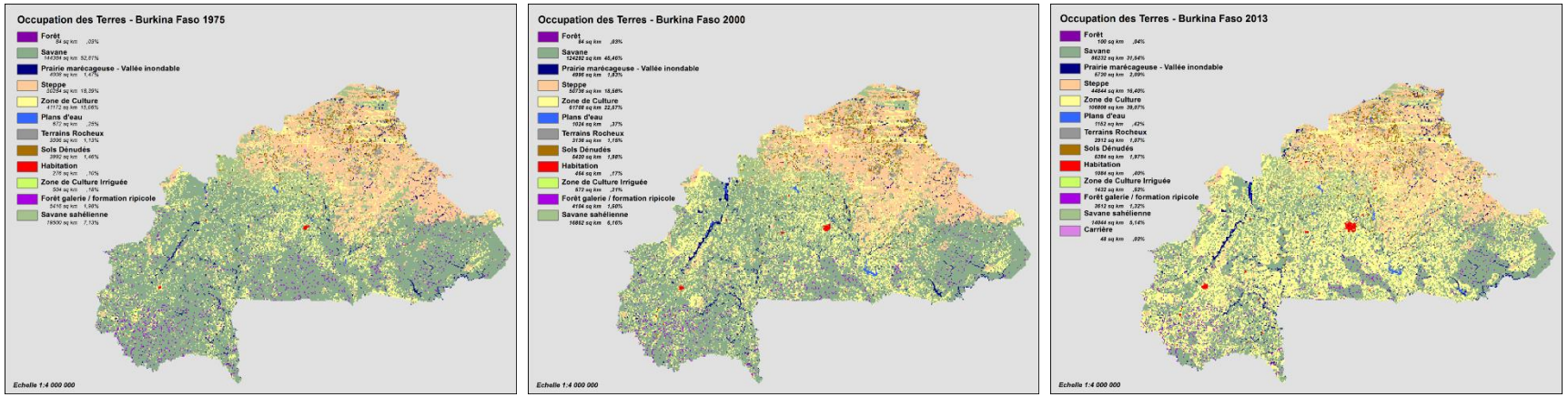


https://www.infonet-biovision.org/EnvironmentalHealth/AEZs-Kenya-System

You can find more information on each step in the script (ELD User Guide: www.eld-initiative.org)

Step 3 – Types of ecosystem services

- Where possible, the agro-ecological data should be complemented by **human geographical data**
- Suitable **time series** allow for the analysis of land use changes over time
- Different **modelling tools** even allow to project future trends or to assess the effects on ecological functions, but the use of these tools is not a prerequisite, at least not for ELD studies at a local level

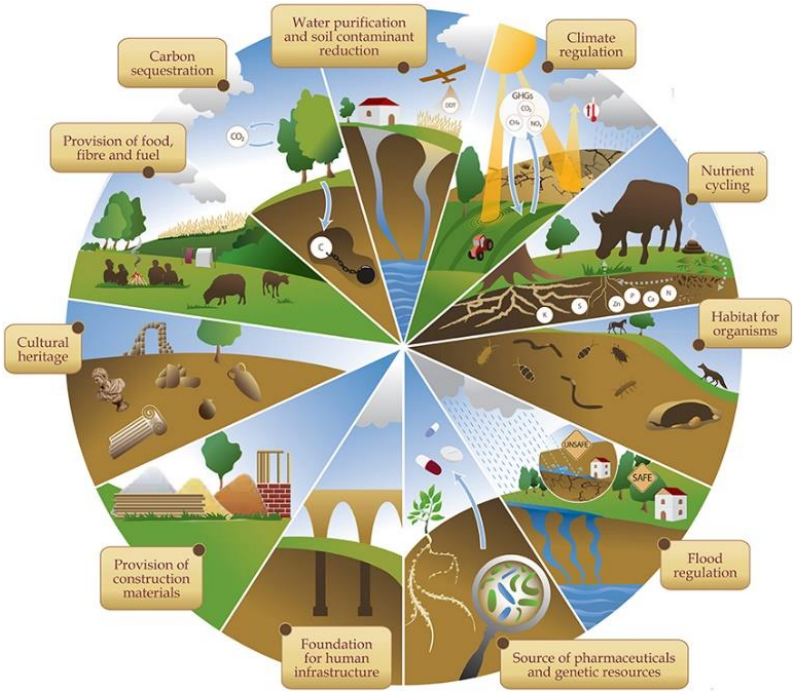


CILLS 2016. Atlas sur les paysages de l'Afrique de l'Ouest

Step 3 – Types of ecosystem services

Identification and analysis of stocks and flows of ecosystem services

- For each land cover category, the **ecosystem services are identified**
- They are classified along four categories (provisioning, regulating, cultural, and supporting services)



Source: FAO 2015. Soil functions.

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Step 3 – Types of ecosystem services

Ecosystem services and examples

(adapted from ELD Scientific Interim Report, 2013[12])

Provisioning	Food, freshwater, fiber, timber, fuel, fodder, minerals, building materials, genetic resources, medicinal resources
Supporting	Primary production, soil formation, nutrient cycling, species habitat, maintenance of genetic diversity
Regulating	Climate regulation, moderation of extreme events, pollution purification, nutrient cycling, erosion prevention, maintenance of soil fertility, pollination
Cultural	Spiritual and aesthetic benefits, educational opportunities, recreation, tourism, hunting

N.B. These are discussed in more detail in Chapter 2

- In theory, all ecosystem services should be valued in the next step; but for practical reasons (limited data availability and/or possibilities to collect own data, etc.) only the most obvious and prominent ones might be selected

Step 3 – Types of ecosystem services

- Note that different tools exist to help assess and quantify ecosystem services
- Biophysical assessments, expert opinions and/or data collections are means to collect, verify or cross-check data

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You can find more information on this step in the module on ecosystem services identification!

Step 4 – Role of ecosystem services and valuation

Role of ecosystem services in community livelihoods and economic valuation

This step is to

- identify the role of ecosystem services in the livelihoods of communities living in each land cover area and in the overall economic development in the study zone
- Each (selected) service (use and non-use values) is valued

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Step 4 – Role of ecosystem services and valuation

An entire range of valuation methods exists.

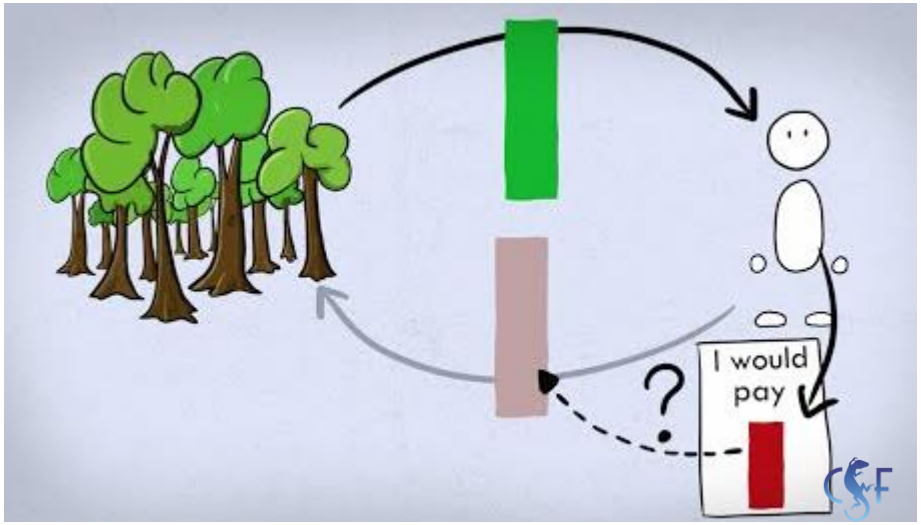
Hereafter, only some examples are given:

- Market prices
- Replacement costs
- Damage costs avoided
- Travel cost method
- Hedonic price method
- Contingent valuation
- Choice experiment

All methods are explained in detail in the module on ecosystem services valuation!

Step 4 – Role of ecosystem services and valuation

- The choice of the methods varies according to the objective, but also data availability and capacities to implement each method
- Attention has to be paid with estimates of “willingness to pay/to accept” since this might lead to high expectations over future financial gains



Source: Conservation Strategy Fund. Video on Valuation of Ecosystem Services-Contingent Valuation

Step 5 – Patterns and pressures

Identification of drivers of degradation and SLM investment scenarios

This step is actually leading to the "business as usual (BAU) scenario"

- Land degradation patterns, drivers and pressures are identified; and future trends projected.

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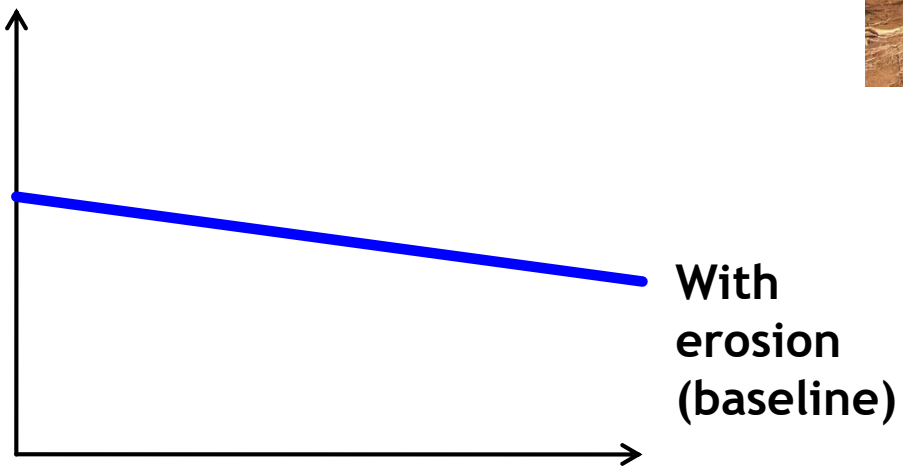


Step 6 – Cost-benefit analysis

Assessment of costs and benefits of SLM investments and decision-making

Key steps of a CBA:

- Definition of the target group
- Determination of time frame and categories of costs and benefits
- Determination of (a) social discount rate(s)
- Calculating economic benefits and costs under different scenarios
- Comparing net benefits “BAU” vs “action”
- Deriving economic indicators of viability
- Undertaking a sensitivity analysis

Step 6 – Cost-benefit analysis

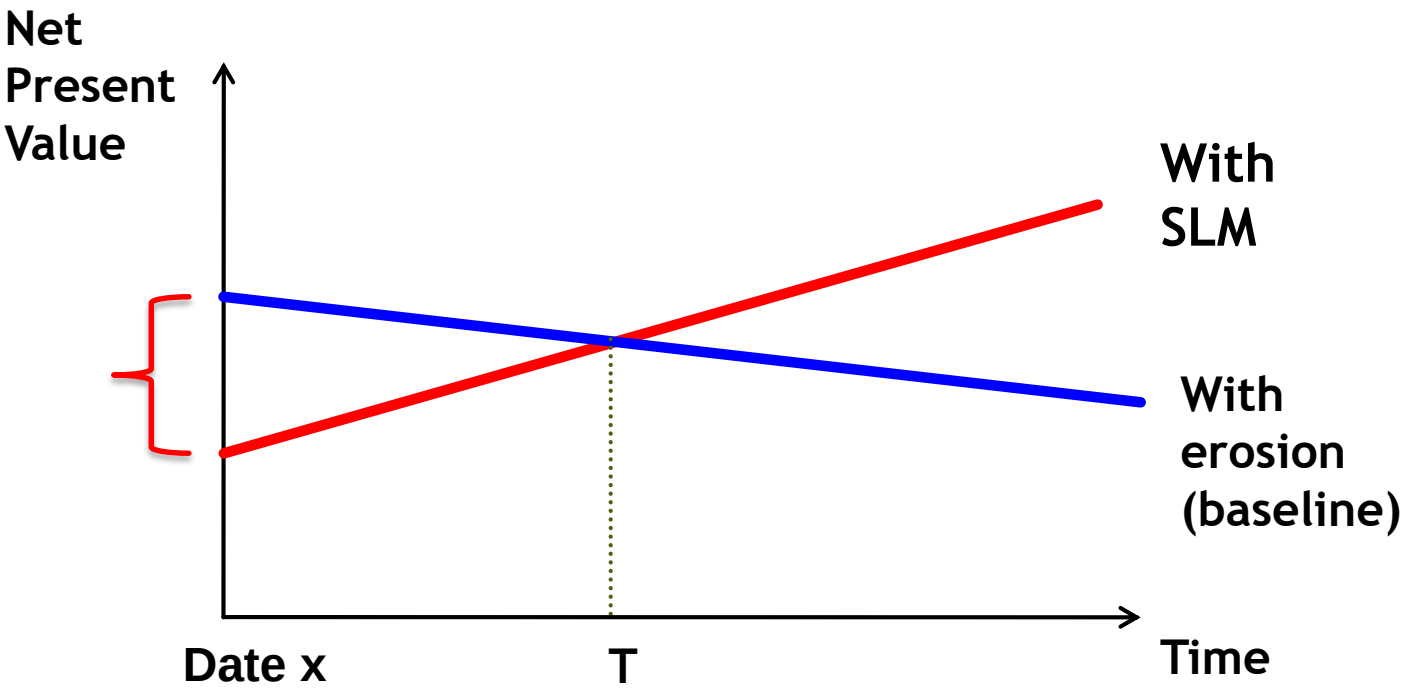
Costs and benefits of (an) 'action' scenario(s) are compared to that of a 'business-as-usual' scenario

	Yr 1	2	3	4
Additional benefits (+) including crops, fire wood, honey, agro-tourism, fodder, avoided damages, etc.				
Additional operating and investment costs (-) including all supplies for SLM investments (costs for water, labour, seeds, rent, etc.)				
Additional net revenue (balance)				

You can find more information on CBA in the respective module!

Step 6 – Cost-benefit analysis

It is finally assessed whether the proposed land management **changes lead to net benefits and when**



The results from the CBA need to be clearly communicated to the target group(s) and recommendations drawn from.

Step 6 +1 – Take action

Dialogues at the science-policy interface will lead to the definition of actual implementation steps to prevent or reduce land degradation or to restore land.

Actions actually need to be taken by

- Land owners or users, i.e. changing their land use practices;
- Policy-makers, i.e. by adapting the legal, political and economic context to enable adoption of SLM

Maybe the private sector is also involved.

You will learn about stakeholder engagement and policy impact in the respective module!

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Further information and reading:

ELD User guide

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If you have questions, please contact us:
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www.eld-initiative.org

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