


“Sustainable land management to ensure food security”

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GLOBAL CHALLENGES

Today, food and agricultural systems are facing an unprecedented confluence of pressures

Population is increasing and requires more and better **food (dietary transition)**, energy, and other agricultural products

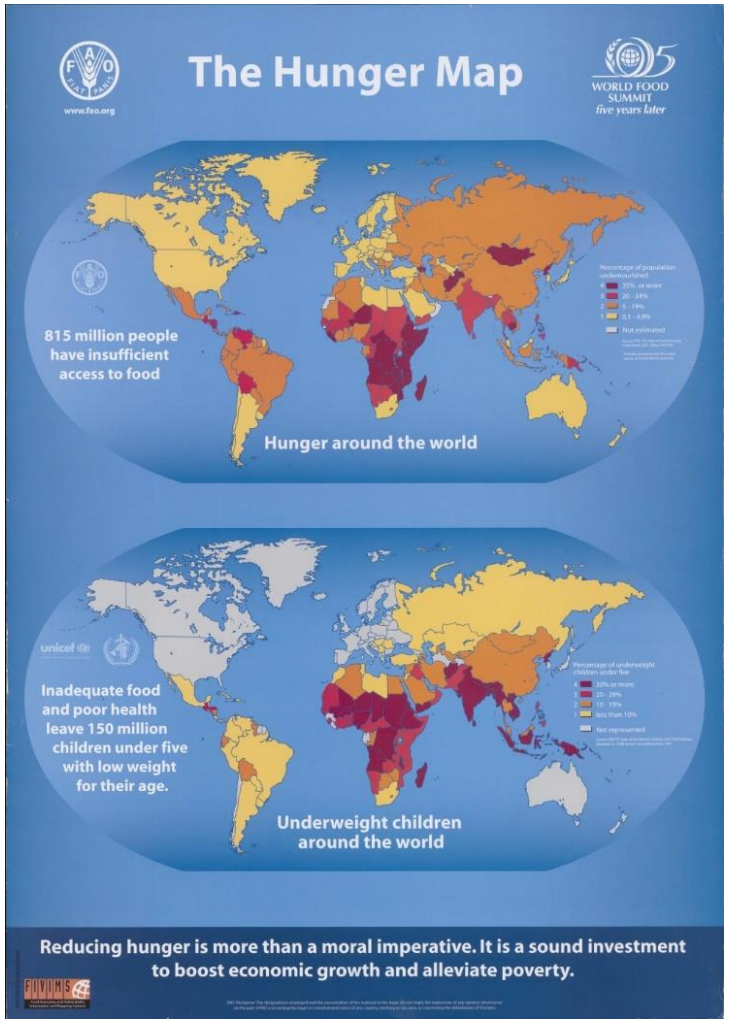
Poverty, inequality, hunger and malnutrition are still higher in **rural areas** than elsewhere

Natural resources are **over-exploited, degraded**, and their productivity declines, biodiversity is shrinking

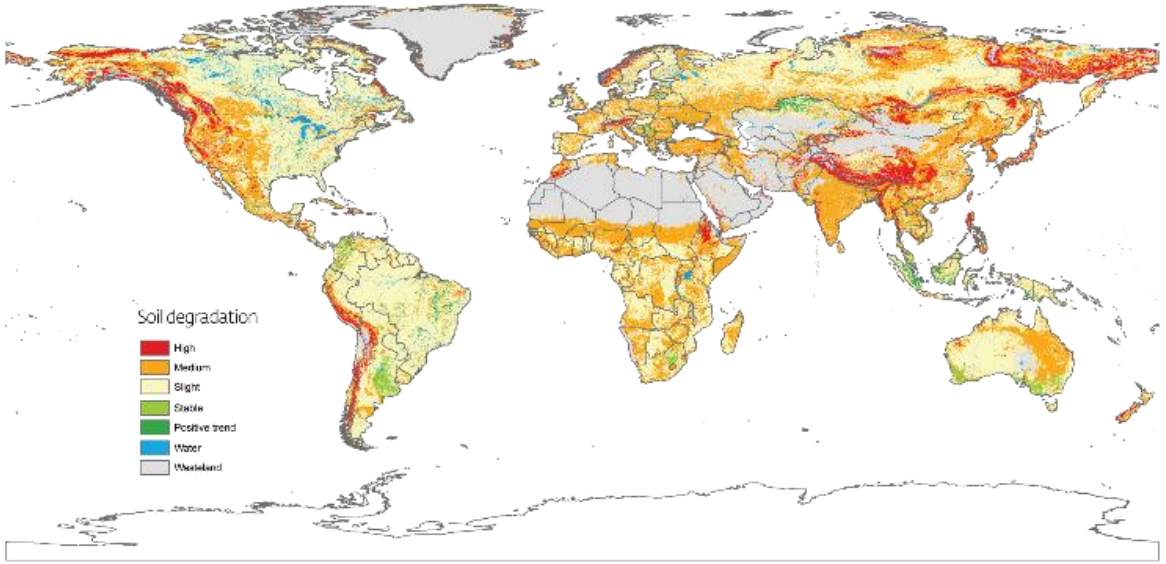
Climate change and volatile **food prices** affect vulnerable people, in particular in rural areas

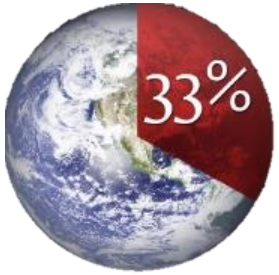
Land degradation elevates **human health and safety risks**, including the emergence of novel infectious diseases, as COVID-19

As **pressure** on resources increase, need for **governance, transparency and participation**



TODAY, 33% of land is moderately to highly degraded





Estimates indicate that land degradation affects at least 2 billion hectares worldwide, impacting directly on 1.5 billion people.

Reversing negative trends of land productivity decline, degradation, rural poverty and food insecurity is a key challenge to achieve SDG 2 (Zero Hunger) and SDG 15 (Life on Land).

Source: Solaw 2011

LDN directly contributes to sustainable agriculture and food security

- Applying LDN on agricultural land means the productivity and the carbon stocks on agricultural land are maintained or increased which directly contributes to sustainable agriculture and food security

- LDN balances gains and losses within the same land type (cropland, grassland) to ensure a no net loss of healthy and productive (agricultural) land

- Following the LDN response hierarchy of Avoid > Reduce > Reverse, LDN on agricultural lands will involve mostly strategies to avoid and reduce new land degradation through sustainable land management (SLM), which is a low-hanging fruit in comparison to reversing land degradation

Types of Land Degradation (examples)

Soil erosion by water
(e.g. gully erosion, mass movements/ landslides, loss of topsoil/ surface erosion)

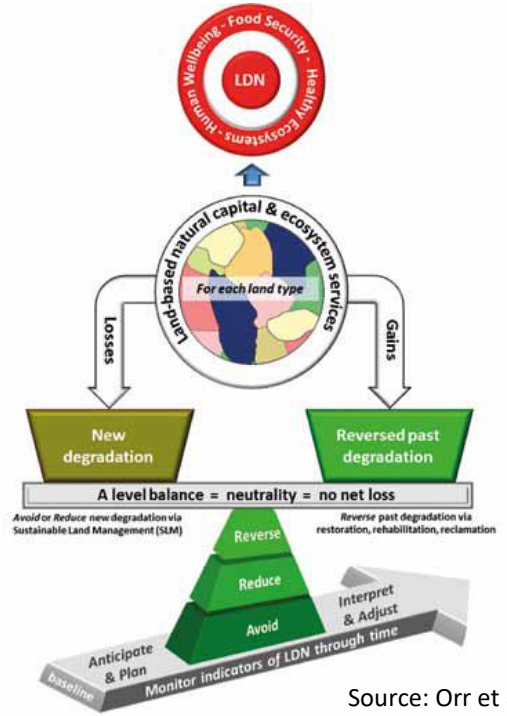

Soil erosion by wind
(e.g. loss of topsoil, deflation and deposition)


Chemical soil deterioration
(e.g. fertility decline and reduced soil organic matter, soil pollution, salinization)


Physical soil deterioration
(e.g. compaction, sealing, waterlogging)

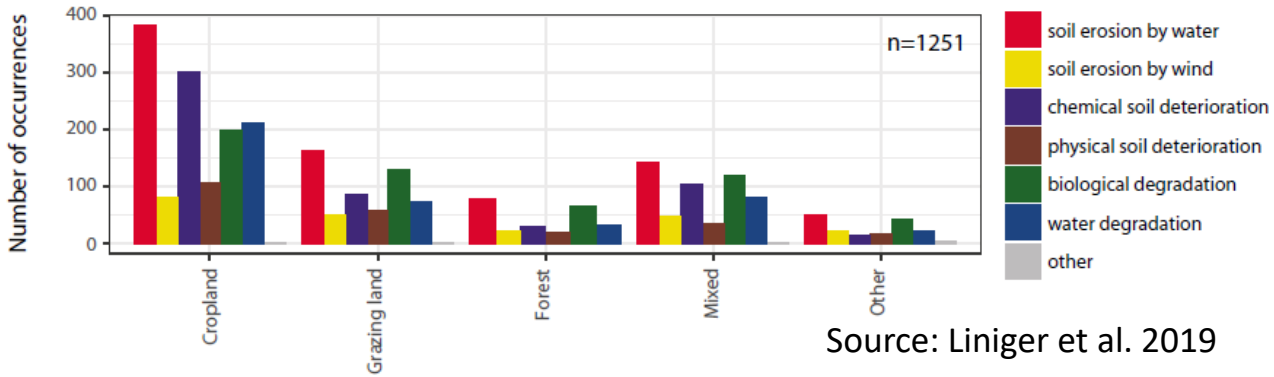

Biological degradation
(e.g. reduction of vegetation cover, loss of habitats, increase of pests/ diseases)


Water degradation
(e.g. change in quantity of surface water, decline of surface water quality)



Source: Orr et al. 2017

LD addressed by SLM Technologies in WOCAT Database



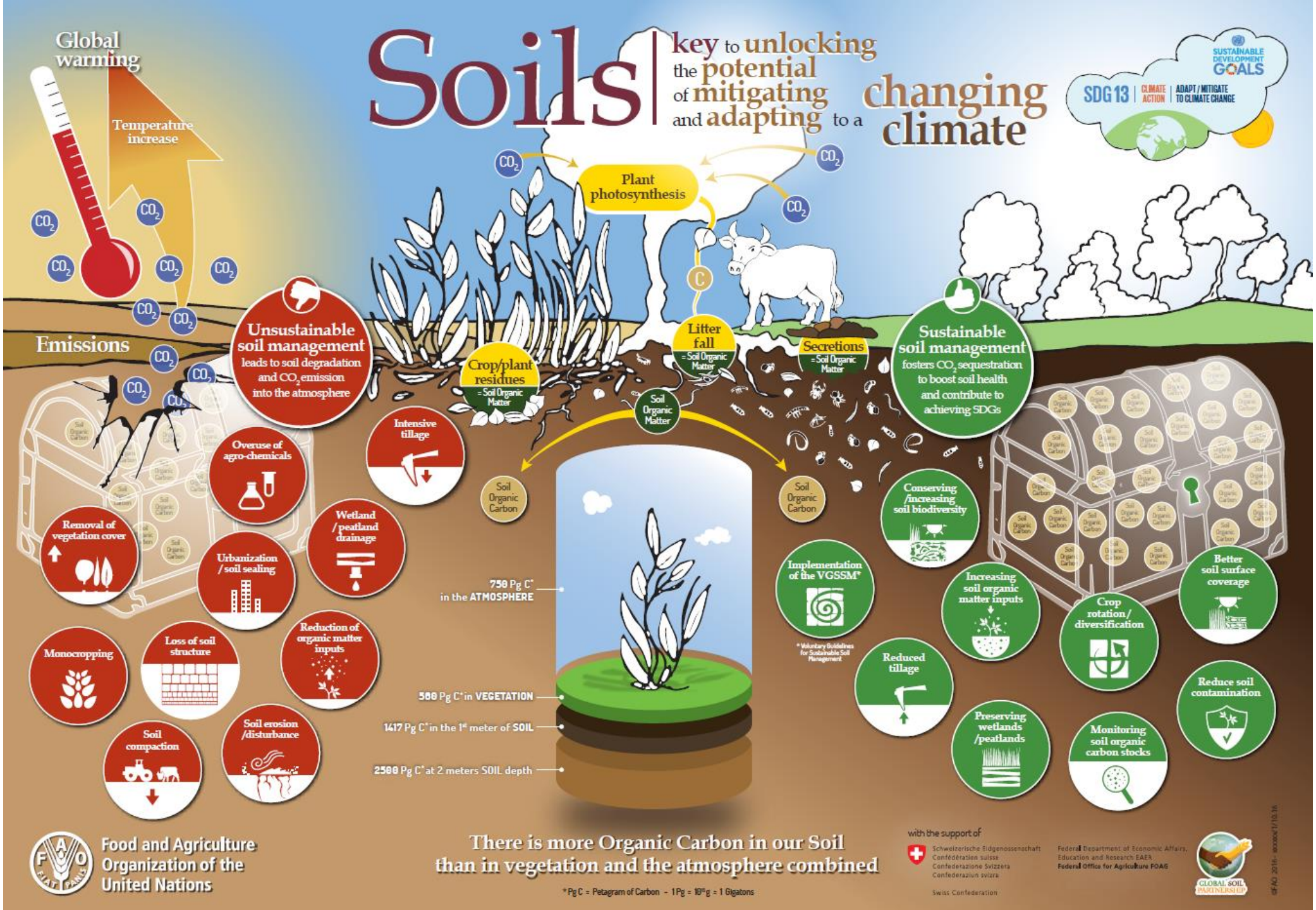
Source: Liniger et al. 2019

SUSTAINABLE LAND WATER MANAGEMENT

- Sustainable land, soil & water management
- Develop guidelines for mainstreaming SLM and Land Resource Planning into policies
- Water, soil & land governance
- LDN and ecosystem restoration
- Combat Land Degradation and Desertification
- Improve livelihoods through participatory and cross-sectoral approaches
- Design methodologies at global, national and local scale

Importance of Soils in Climate Change

- Soils – host largest terrestrial carbon pool;
- Land use and land use change among the largest sources of greenhouse gas emissions;
- Soils - important in both the **climate change challenges** (CO_2 emissions) and **solutions** (soil C sequestration);
- **Sustainable soil management** is the key to increase soil organic matter content;


Soils
key to unlocking the potential of mitigating and adapting to a changing climate
SUSTAINABLE DEVELOPMENT GOALS
SDG 13 | CLIMATE ACTION | ADAPT / MITIGATE TO CLIMATE CHANGE
Global warming
Temperature increase
Emissions
Plant photosynthesis
Unsustainable soil management leads to soil degradation and CO2 emission into the atmosphere
Crop/plant residues = Soil Organic Matter
Litter fall = Soil Organic Matter
Secretions = Soil Organic Matter
Soil Organic Matter
Soil Organic Carbon
Soil Organic Carbon
Sustainable soil management fosters CO2 sequestration to boost soil health and contribute to achieving SDGs
Intensive tillage
Overuse of agro-chemicals
Removal of vegetation cover
Wetland / peatland drainage
Urbanization / soil sealing
Monocropping
Loss of soil structure
Reduction of organic matter inputs
Soil compaction
Soil erosion /disturbance
750 Pg C* in the ATMOSPHERE
560 Pg C* in VEGETATION
1417 Pg C* in the 1st meter of SOIL
2500 Pg C* at 2 meters SOIL depth
Conserving /increasing soil biodiversity
Implementation of the VGSSM*
*Voluntary Guidelines for Sustainable Soil Management
Increasing soil organic matter inputs
Better soil surface coverage
Crop rotation / diversification
Reduced tillage
Reduce soil contamination
Preserving wetlands /peatlands
Monitoring soil organic carbon stocks
Food and Agriculture Organization of the United Nations
There is more Organic Carbon in our Soil than in vegetation and the atmosphere combined
* Pg C = Petagram of Carbon - 1 Pg = 10^15 g = 1 Gigatons
with the support of
Schweizerische Eidgenossenschaft
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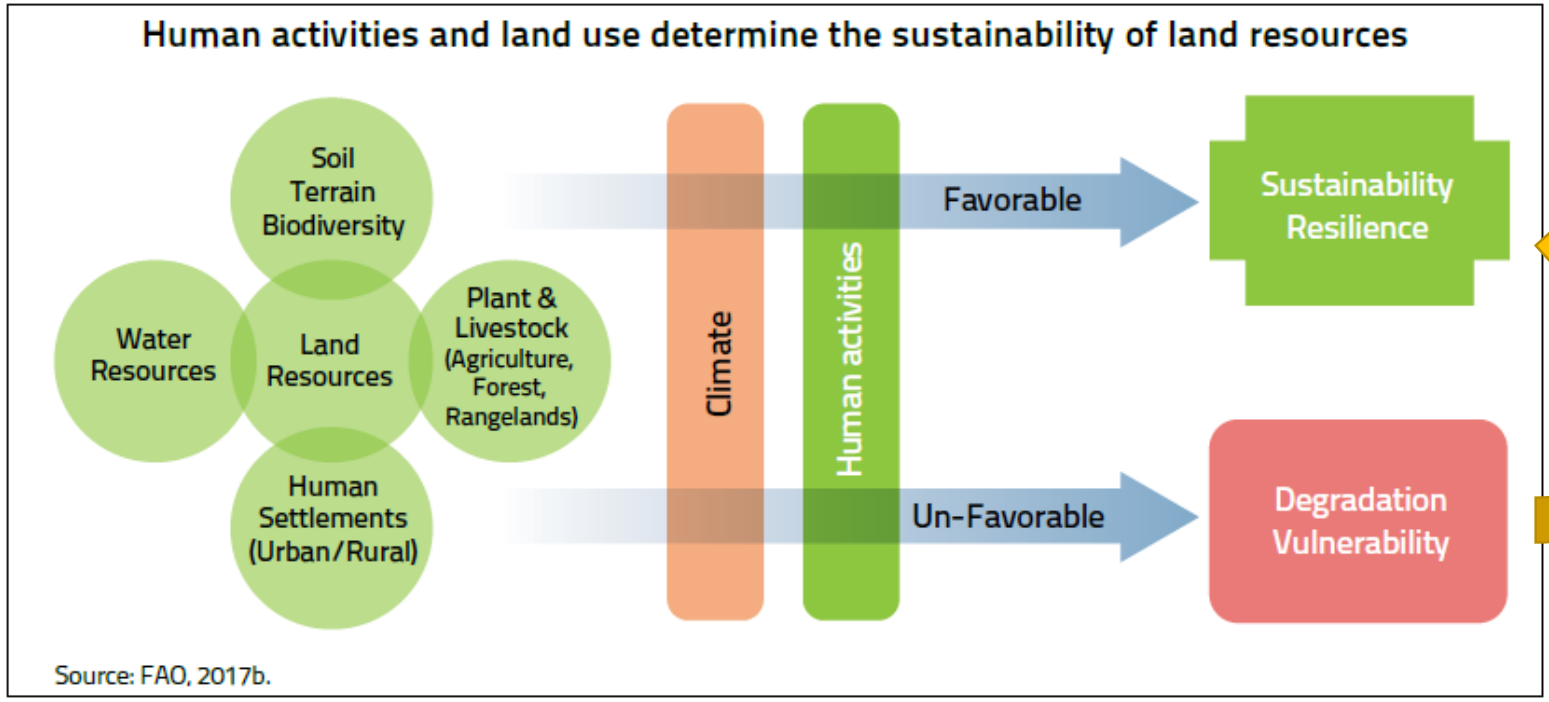
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
Federal Office for Agriculture FOAG
GLOBAL SOIL PARTNERSHIP

Reversing Land Degradation

A scientific evidence-based approach is crucial to develop, test, implement and scale-out sound and acceptable SLWM options.

From degradation and vulnerability to sustainability through proper land use and sustainable land management → The role of land resources planning



Land resources planning

↓

SLM

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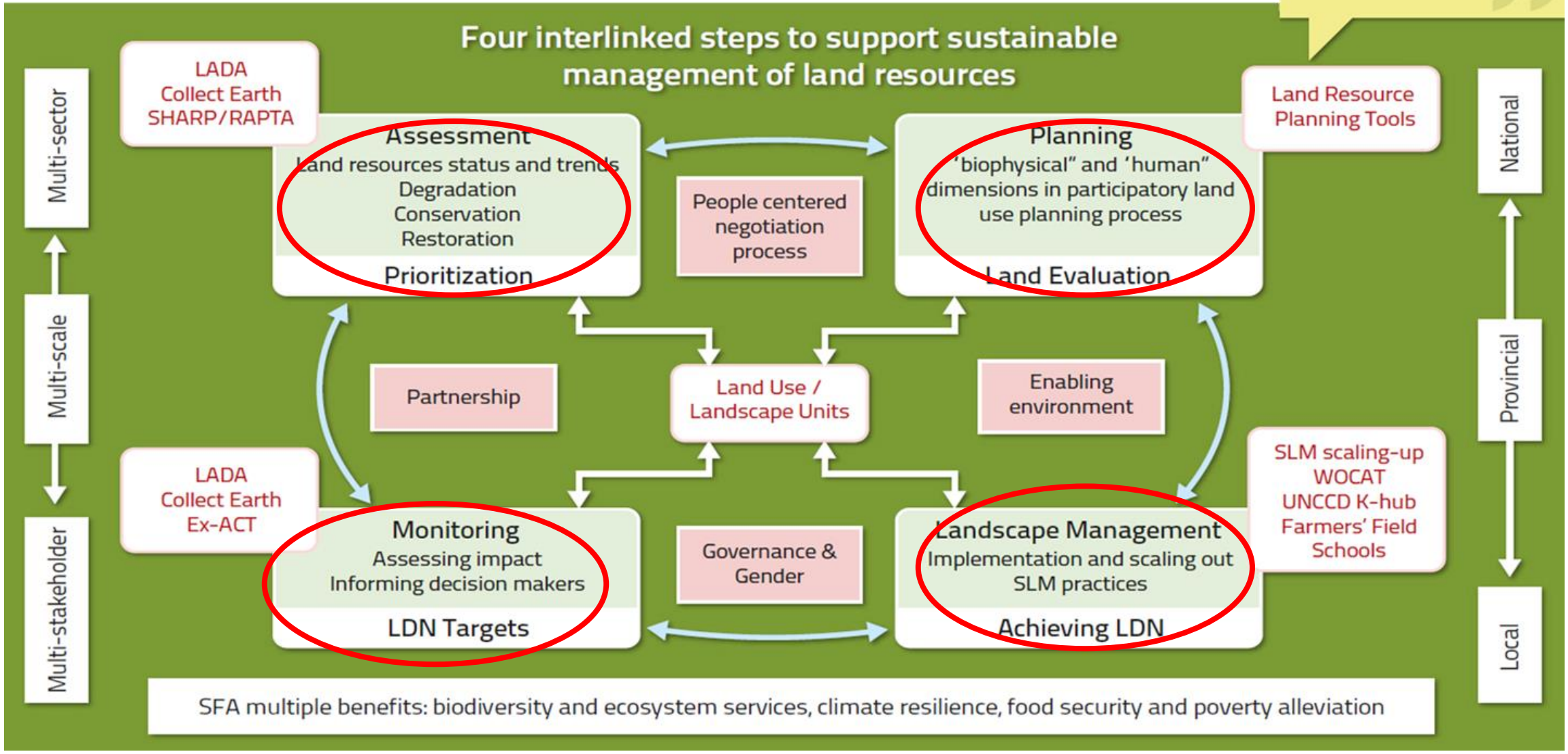
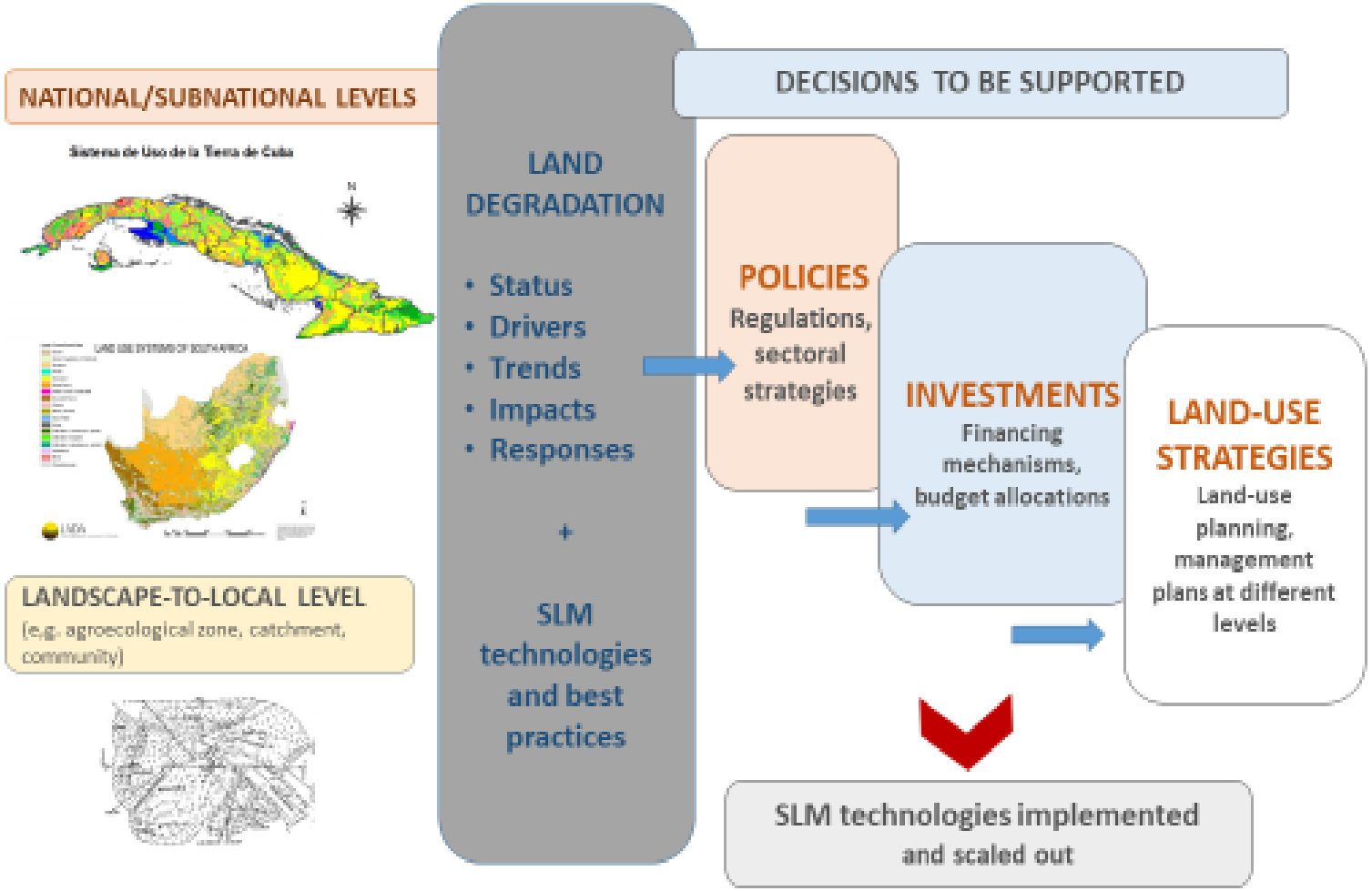
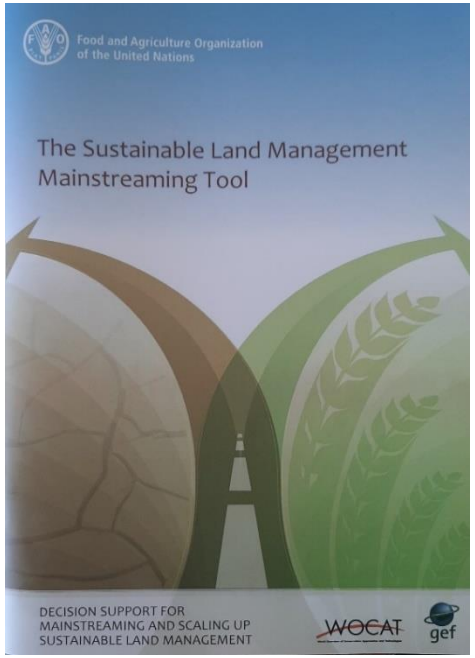
Reversing land degradation

What is the process?
Sustainable land resources management framework



SLM mainstreaming and scaling up strategies
concrete activities for mainstreaming SLM into key decision-making processes at different levels





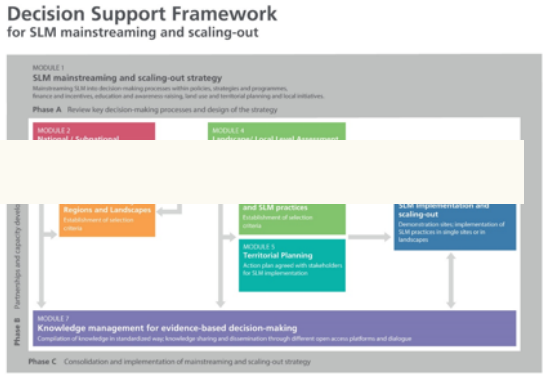
Sustainable Land Management (SLM)

FAO works to promote coherent approaches to sustainable land and water management.

Outputs and outcomes:

- Optimize water cycling, storage and use, prevent pollution (chem and biological)
- Enhance biodiversity
- Optimize the production of healthy food, animal feed
- Enhance resilience to natural disasters

Decision support for mainstreaming and scaling out sustainable land management DS-SLM



GEF-funded Global Project implemented by FAO-WOCAT (2005-2019) in 15 countries

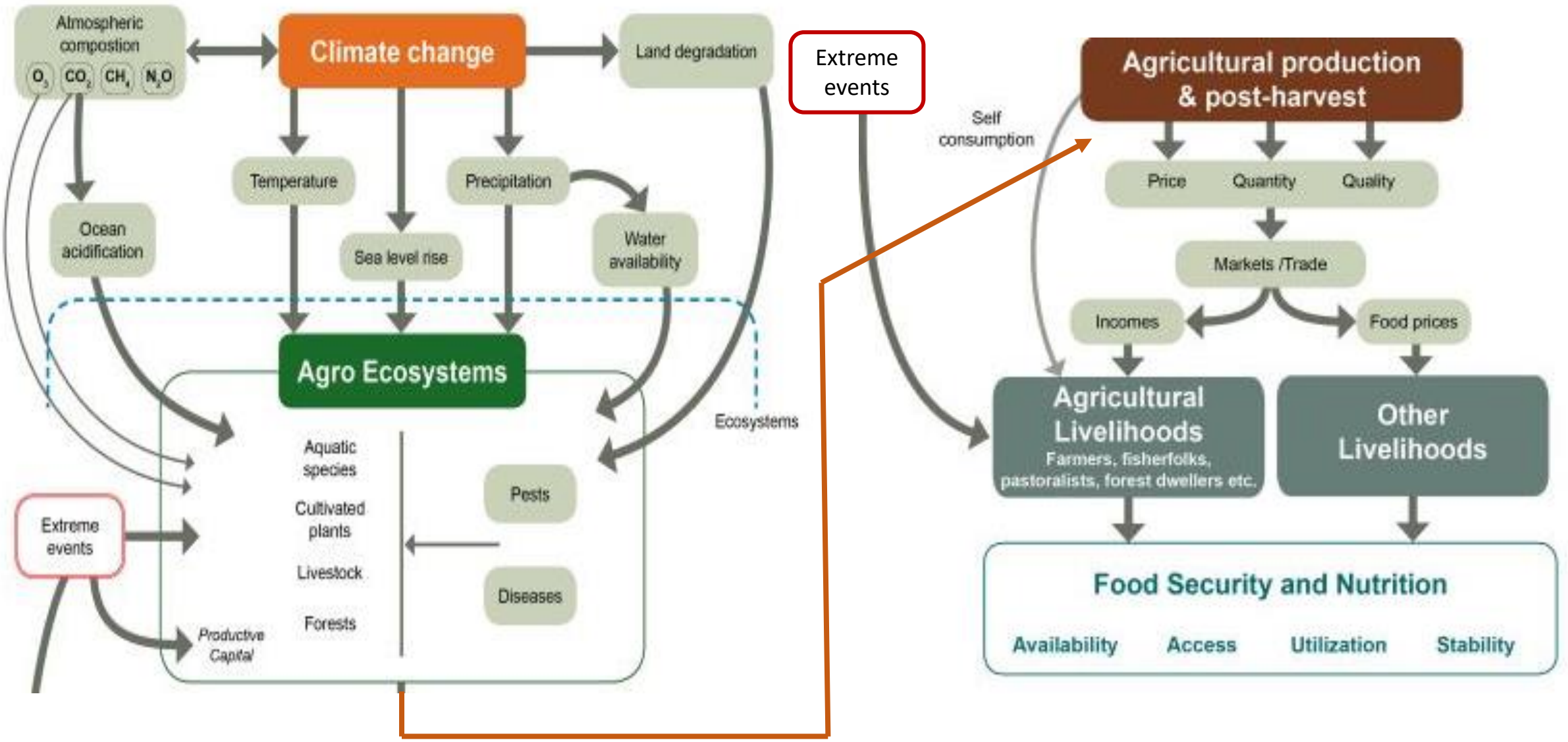
- Participatory **assessments and mapping on land degradation (LD)** at different scales (national, landscape and local levels), mainly through LADA methodology.
- Assessment and documentation **of sustainable land management (SLM) practices**.
- **SLM Mainstreaming and scaling up strategies** to integrate SLM into national, landscape and local decision making processes (policies, financing mechanisms, land use planning and local decisions) to facilitate implementation and scaling up of SLM.
- **DS-SLM framework**, experience, tools and results used for planning and achieving Land Degradation Neutrality (LDN)

http://www.fao.org/land-water/land/sustainable-land-management/slm-practices/en//

What kind of outcome of the Koronivia Joint Work on Agriculture could help to overcome the identified barriers?

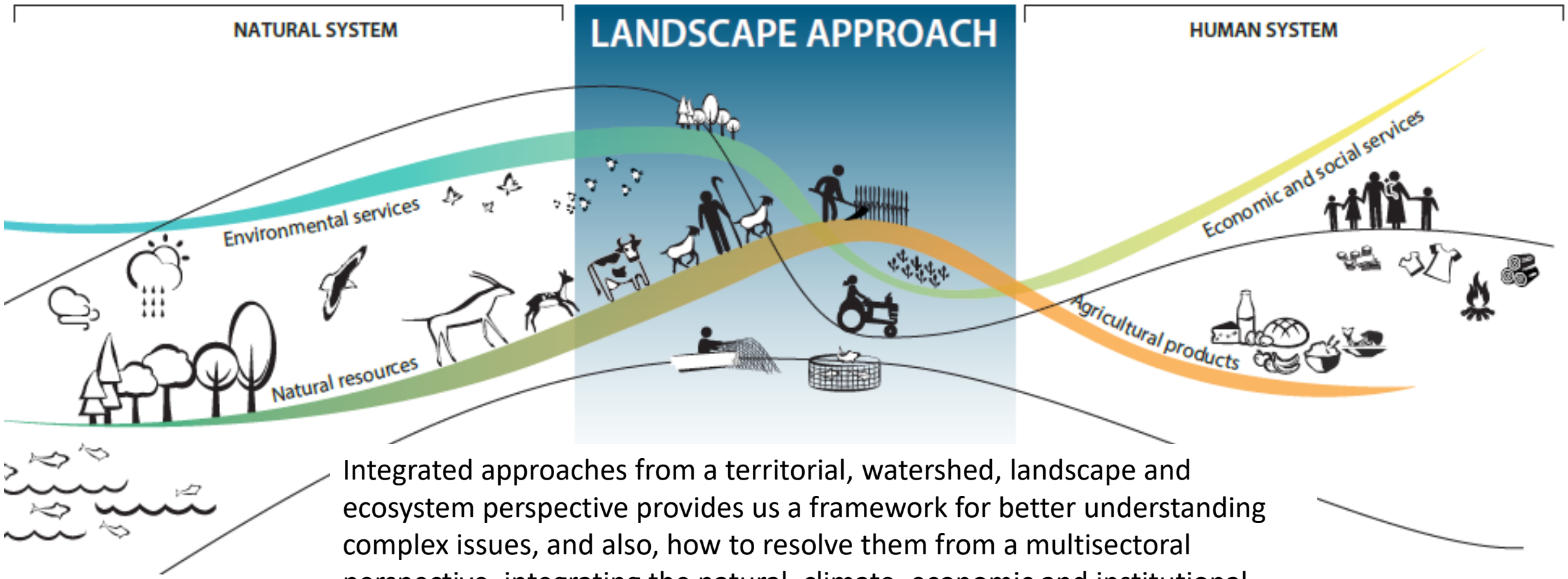
No regret options	Adaptation	Co-benefit-Mitigation	Other benefits (not specific only to UNFCCC)
Heathy soil: increasing SOM *(Topic 2b and 2c)*	Ensure resilience Increase crop productivity	Increase carbon sequestration	Water retention capacity / avoid land degradation
Healthy animal *(Topic 2d and 2e)*	Increase productivity	Relative mitigation	Improving water use efficiency, less water pollution Improve food safety
Avoid open-burning *(Topic 2a and others)*	Increase nutritious animal-source foods (ASF)		Heath/air pollution
Crop diversification, including agroforestry, for better land/water management *(Topic 2c and 2d)*	Efficient resource use Disaster reduction	Increase biomass	Food security Reduction of rural poverty

Relation between land degradation – climate change -food and nutrition security



www.fao.org/3/a-i5188e.pdf

INTEGRATED APPROACHES FOR UNDERSTANDING AND ADDRESSING THE CHALLENGE OF SDGs



Integrated approaches from a territorial, watershed, landscape and ecosystem perspective provides us a framework for better understanding complex issues, and also, how to resolve them from a multisectoral perspective, integrating the natural, climate, economic and institutional perspectives.

THANK YOU!

Fotos: Vera Boerger