



United Nations
Convention to Combat
Desertification

Bioenergy and Land Degradation Neutrality

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Lead Scientist



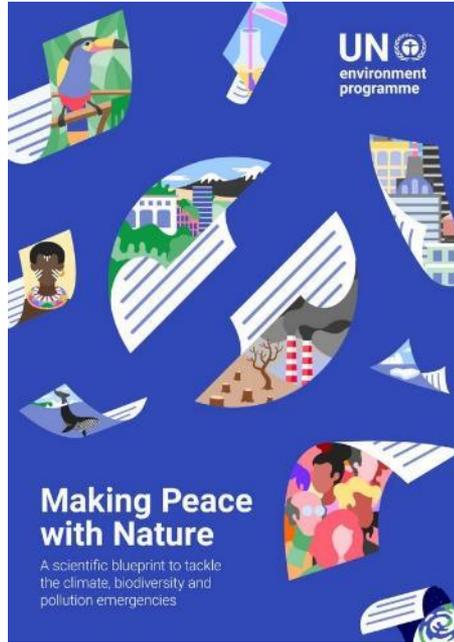
Workshop on Co-benefits of Biomass Supply
Day 2: Global and National Case Studies
16 June 2021 | 13:30 – 17:30 (CEST)



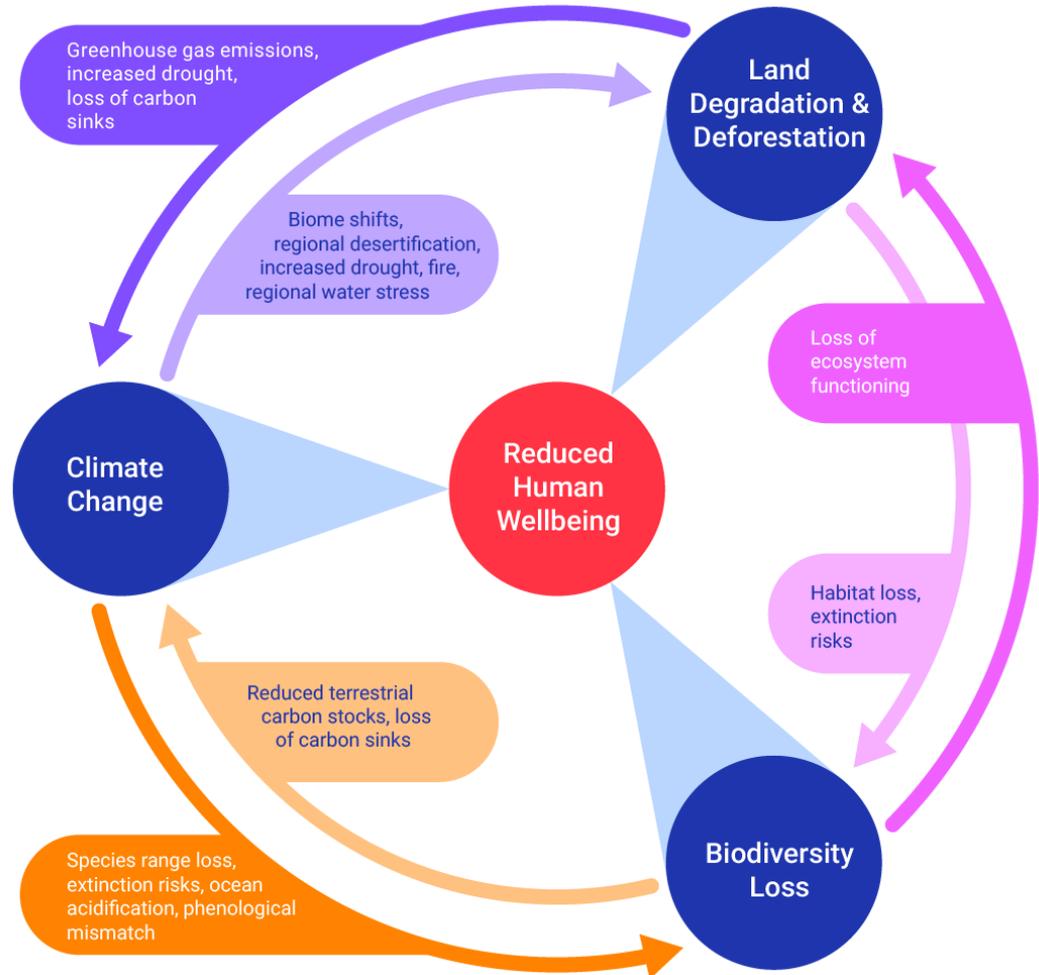
The environmental emergencies are intertwined...

So are the co-benefits of action...
particularly when land is made part
of the solution

Making Peace with Nature (UNEP 2021)



(Slide: Courtesy, Sir Robert Watson)

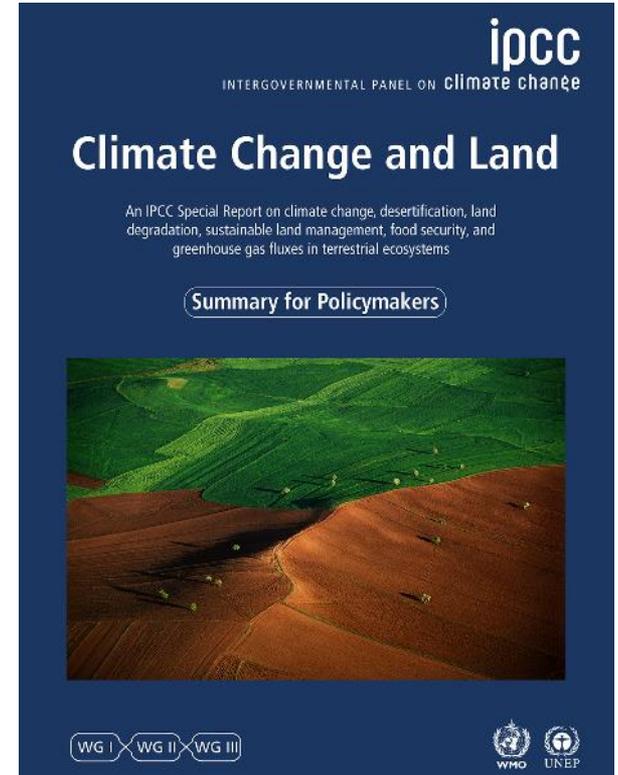


Climate change and land

- Climate change **exacerbates** land degradation
- Land degradation is a **driver** of climate change through emissions of GHGs and reduced uptake of carbon
- Gross emissions from Agriculture, Forestry and Other Land Use make up **1/3 of total global emissions**
- Land accounts for **61% of anthropogenic methane emissions**.
- **50% of the nitrogen** applied to agricultural land is **not taken up by the crop**, resulting in nitrous oxide emissions

<https://www.ipcc.ch/report/srccl/>

(Slide: Courtesy, Dr. Jim Skea, IPCC)

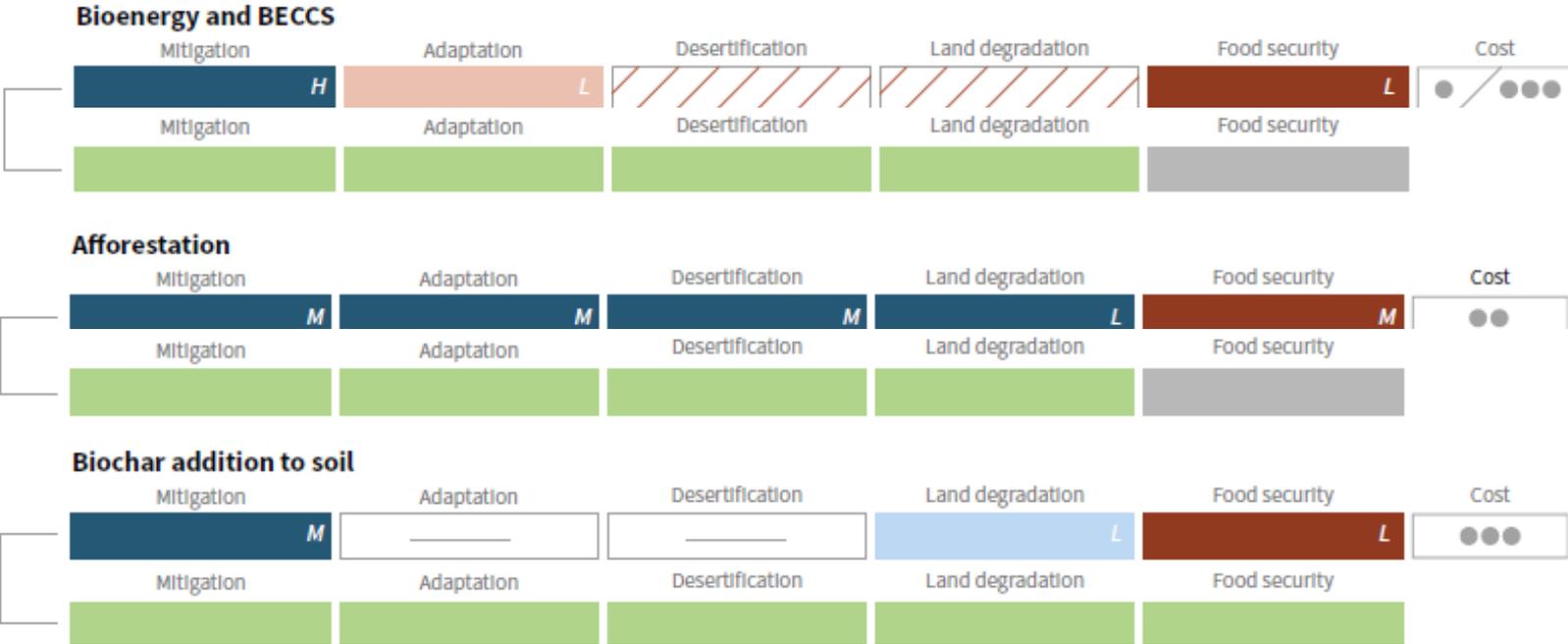


Land management options with a large mitigation potential

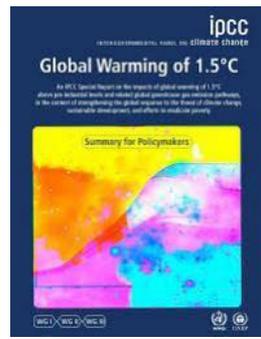
	Mitigation	Adaptation	Desertification	Land Degradation	Food Security	Cost
Agriculture						
Increased food productivity	L	M	L	M	H	<input type="text"/>
Agro-forestry	M	M	M	M	L	<input type="checkbox"/>
Forests and soils						
Reduced deforestation and forest degradation	H	L	L	L	L	<input type="checkbox"/>
Increased soil organic carbon content	H	L	M	M	L	<input type="checkbox"/>
Ecosystems						
Fire management	M	M	M	M	L	<input type="checkbox"/>
Restoration & reduced conversion of coastal wetlands	M	L	M	M	L	<input type="text"/>

Courtesy, Dr. Jim Skea, IPCC)

Strategies with risks and opportunities



Courtesy, Dr. Jim Skea, IPCC)

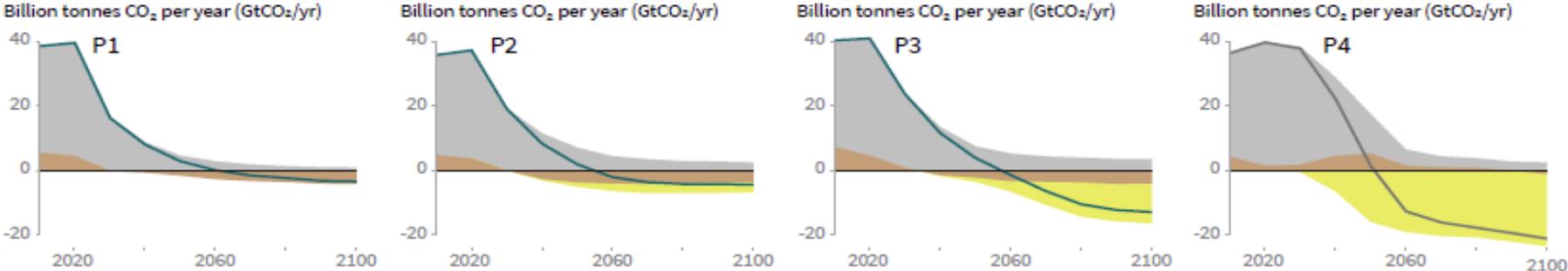


Substantial negative emissions needed to meet 1.5°C

A large role for bioenergy/BECCS in most scenarios

Breakdown of contributions to global net CO₂ emissions in four illustrative model pathways

● Fossil fuel and industry ● AFOLU ● BECCS



Source: IPCC SR1.5

- P1:**
- Low energy demand
 - Afforestation
 - No CCS, no BECCS

22 m ha

- P2:**
- Sustainability
 - Healthy consumption
 - Limited BECCS

93 m ha

- P3:**
- Middle-of-the-road
 - Supply side mitigation

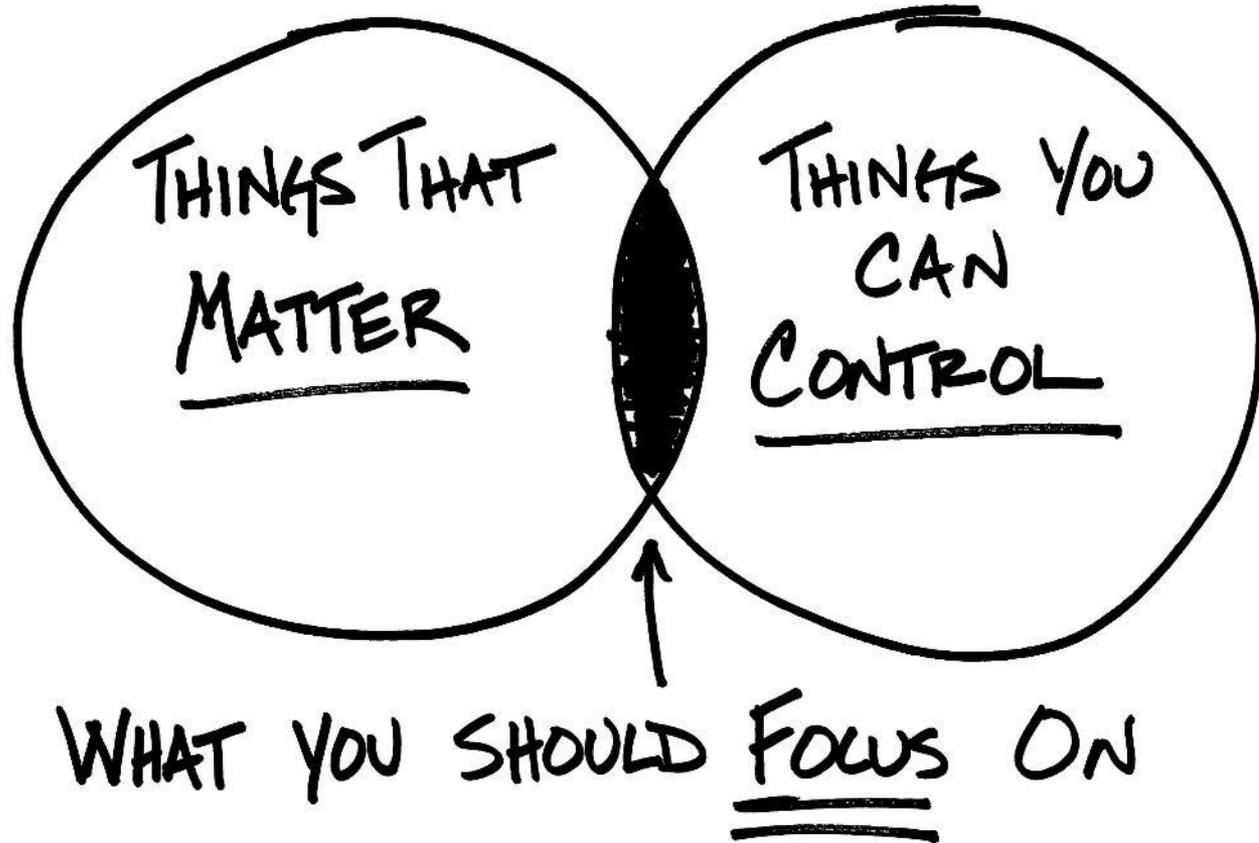
283 m ha

- P4:**
- High resource and energy use
 - GHG-intensive lifestyles
 - Major role for BECCS

724 m ha

Area of energy crops in 2050

How can we manage the risks?



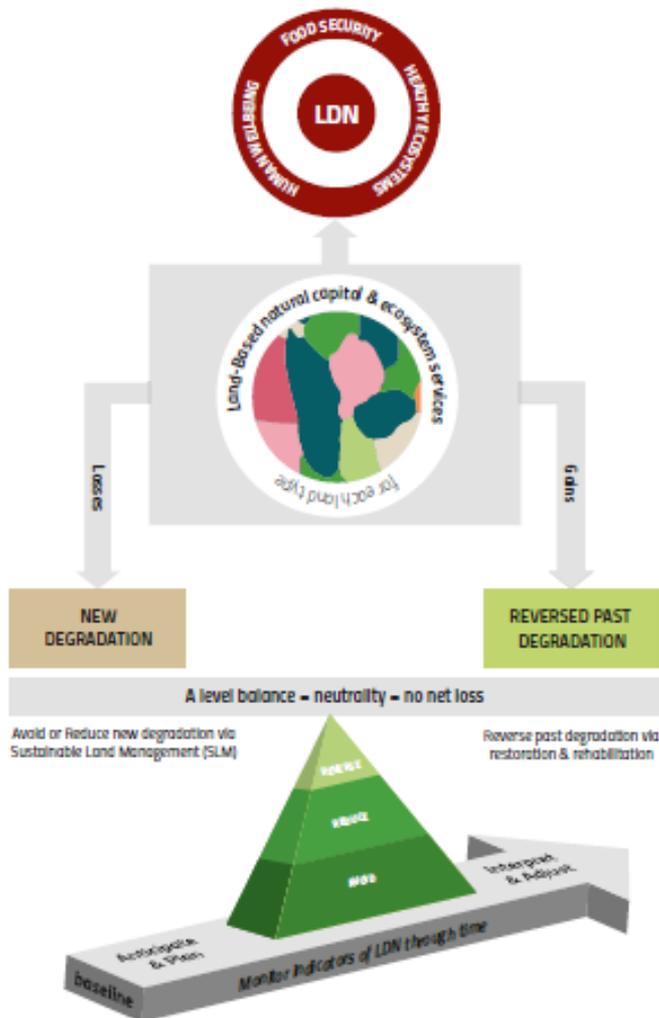
A balanced approach is needed.

- One that **anticipates new degradation** even as we plan to reverse past degradation
- One that **considers tradeoffs** among competing interests across the landscape

LDN provides the framework for this.



Land Degradation Neutrality (LDN)



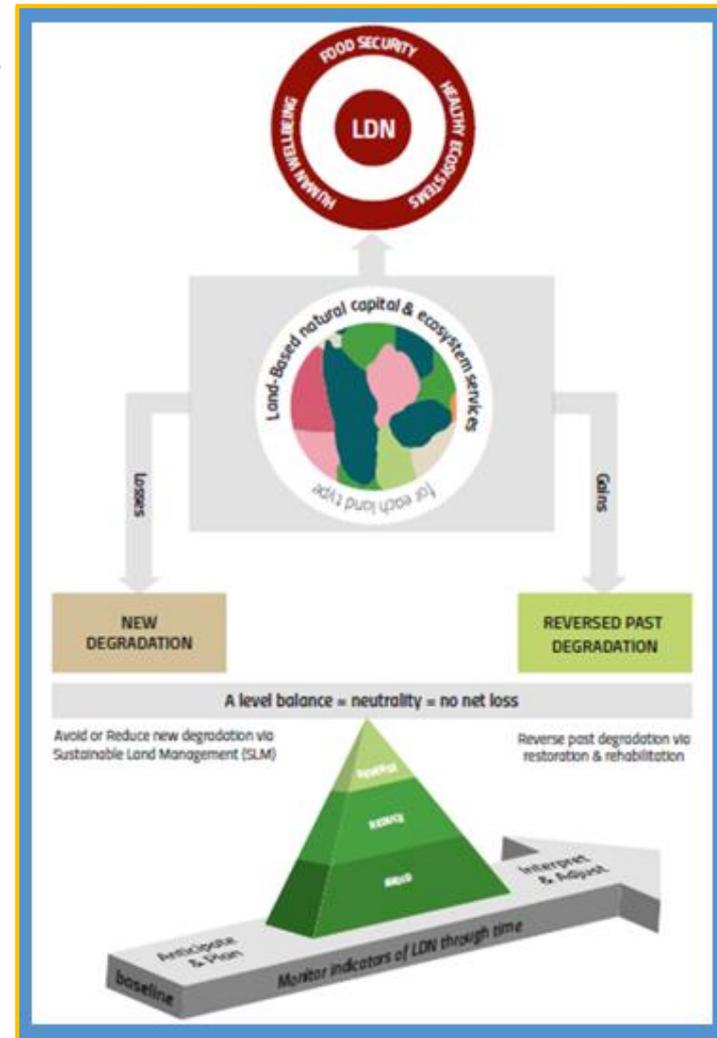
“A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems”

UNCCD COP12 October 2015

Land Degradation Neutrality

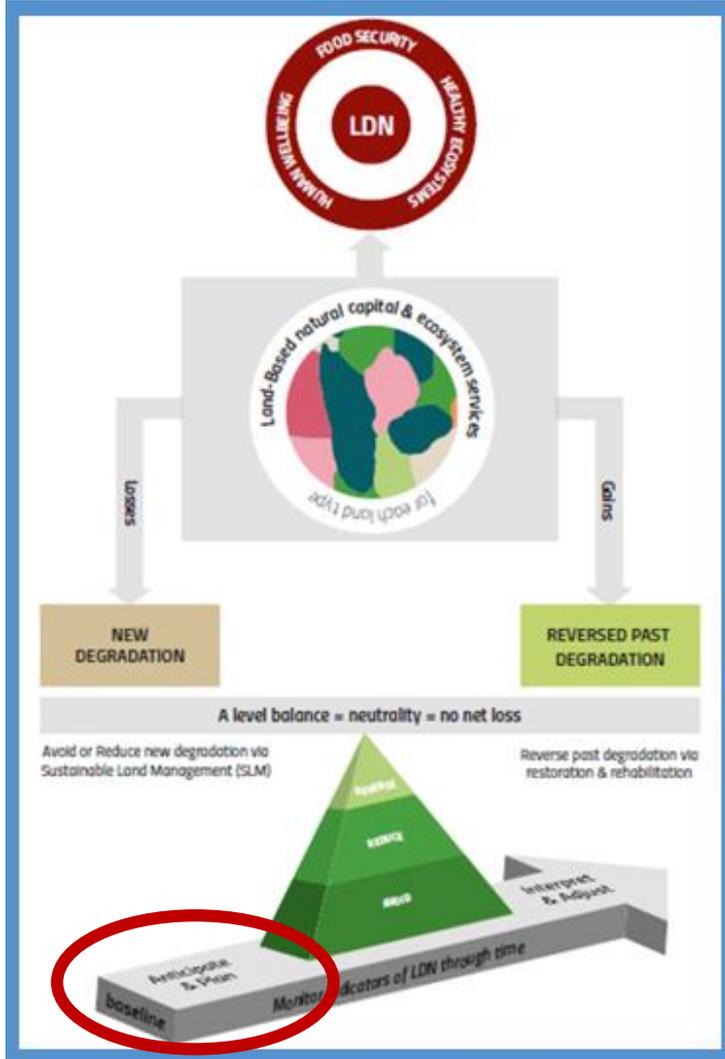
- LDN seeks to **maintain natural capital** and the **ecosystem services** that flow from it;
- LDN is about keeping **land in balance**;
- Keeping land in balance provides the basis for **keeping food, water, energy, carbon and biodiversity in balance** as well;
- LDN is about achieving **multiple benefits**;
- LDN provides a framework with **multiple entry points** which facilitate **optimizing the synergies** among the Rio Conventions (Climate Change, Biodiversity, Land Degradation).

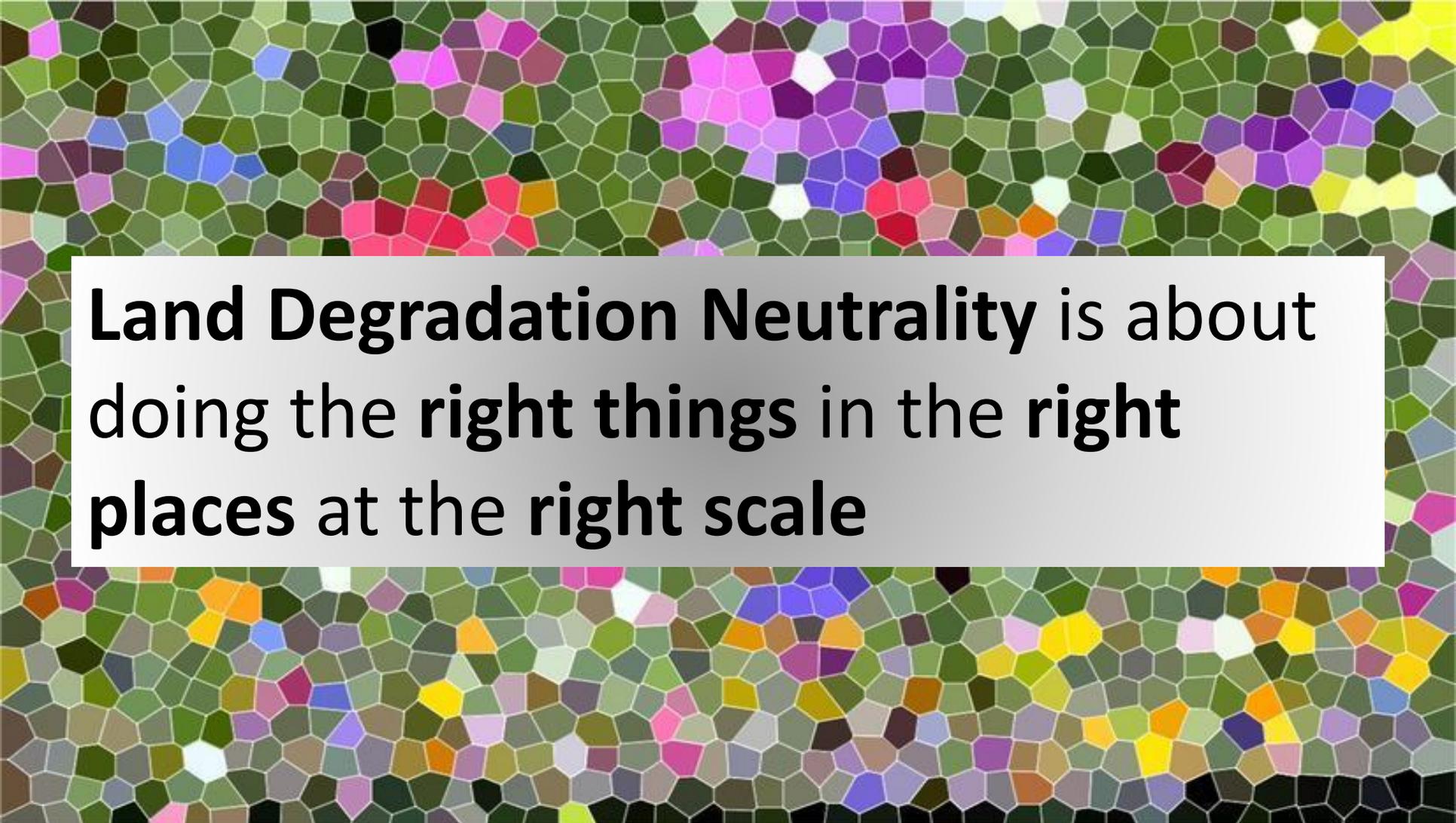
<https://knowledge.unccd.int/publication/ldn-scientific-conceptual-framework-land-degradation-neutrality-report-science-policy>



Integrated land use planning

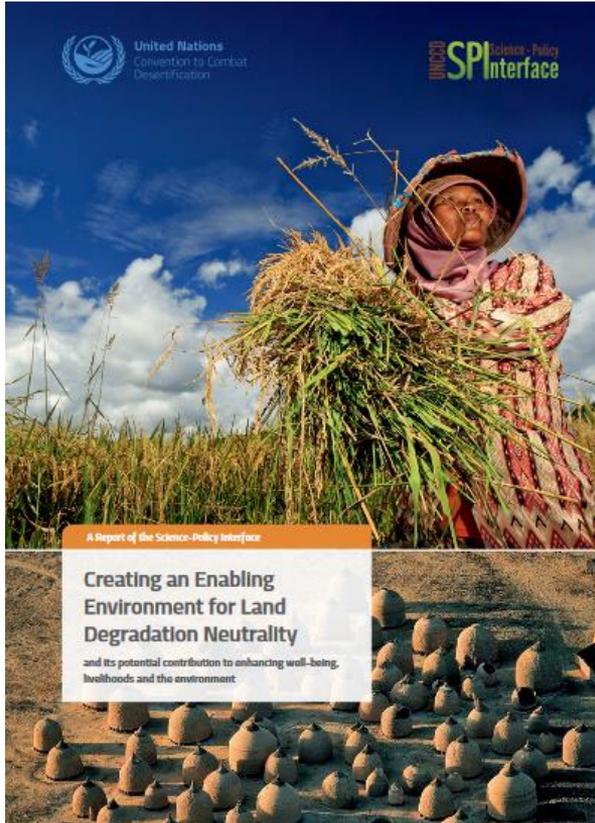
LDN planning (from target setting to territorial / spatial planning to integrated landscape management) involves anticipating where degradation is likely and modelling the tradeoffs among competing demands on land resources, location by location, so that the optimal mix of interventions across the landscape to achieve neutrality can be pursued.





Land Degradation Neutrality is about
doing the **right things** in the **right**
places at the **right scale**

Creating an enabling environment



UNCCD-SPI Technical Report

Creating an Enabling Environment for Land Degradation Neutrality and Its Potential Contribution to Enhancing Well-Being, Livelihoods and the Environment

<https://knowledge.unccd.int/publication/creating-enabling-environment-land-degradation-neutrality-and-its-potential>

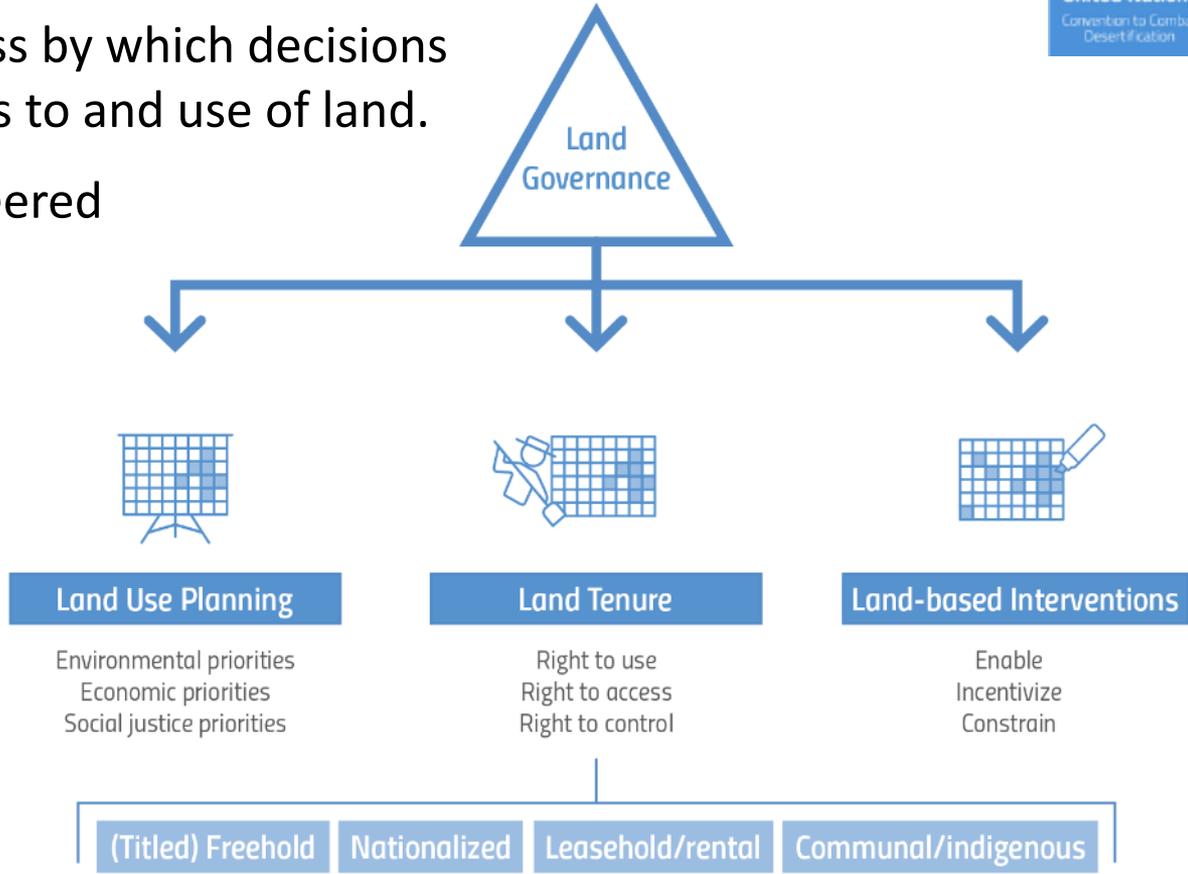
Photo credit: Woman working on rice plant farm, Southeast Sulawesi, Indonesia © Yusuf Ahmad/ICRAF
Traditional Village, Tahoua, Niger © Yann Arthus-Bertrand/GoodPlanet Foundation

Effective land governance is critical

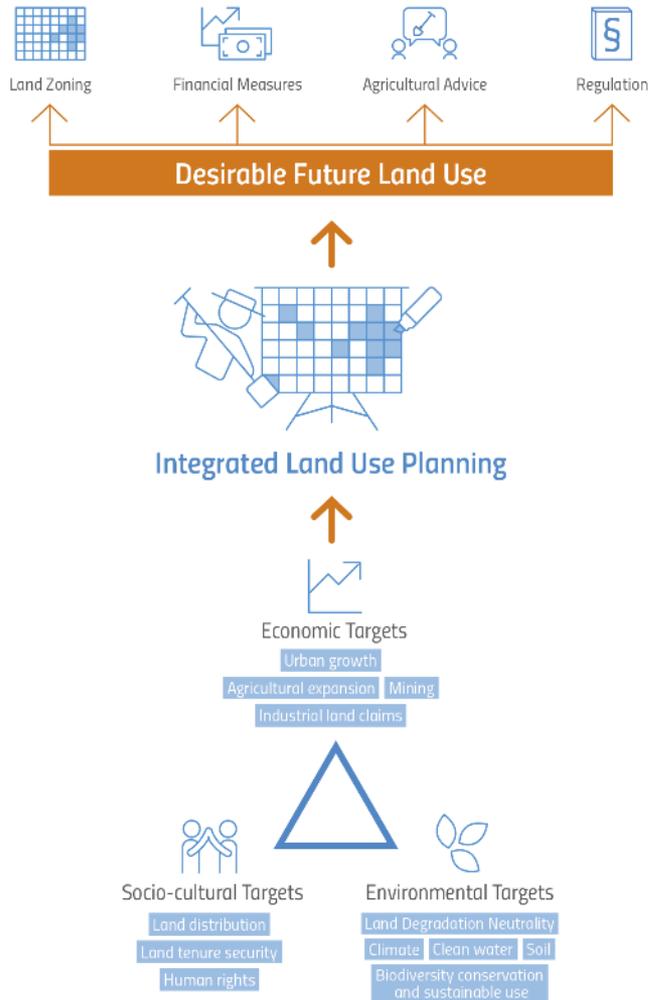
Land governance is the process by which decisions are made regarding the access to and use of land.

Land managers need to be steered towards sustainability through inclusive and responsive land governance through:

- Effective laws and regulations
- Maximizing land tenure security
- Enhance co-benefits of improved livelihood and well-being



Land use planning



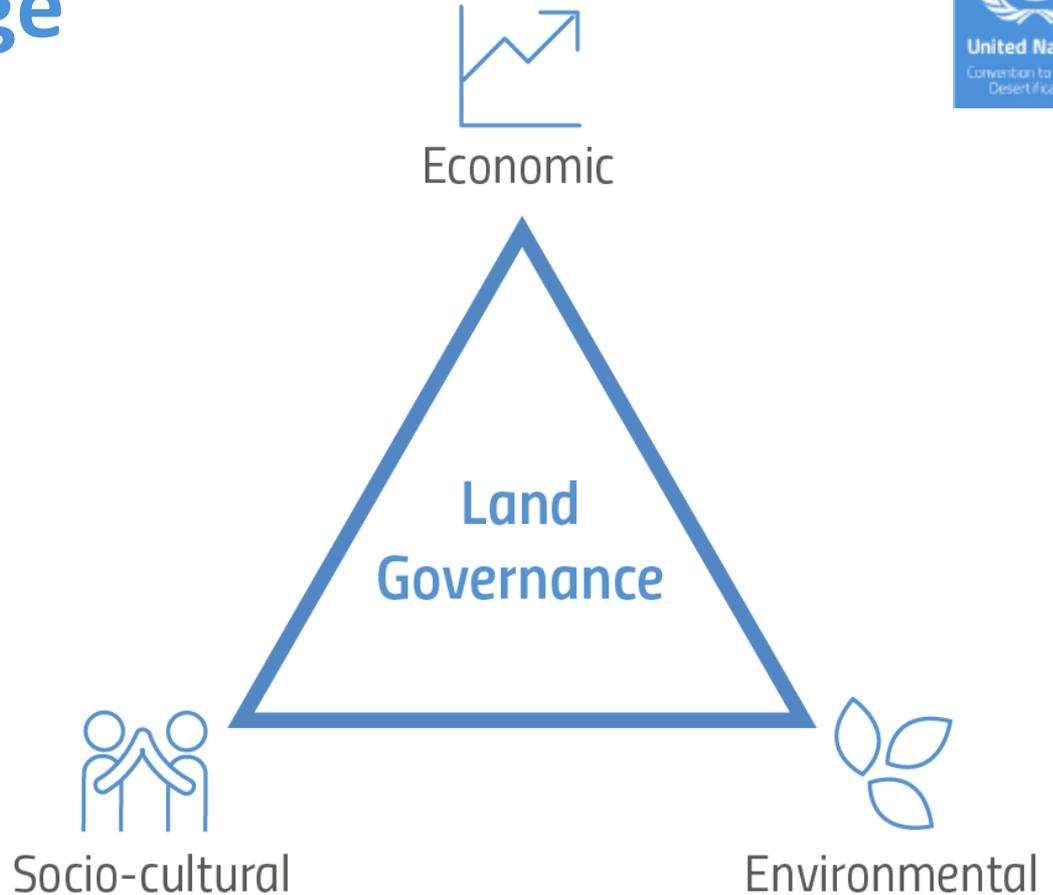
Integrated land use planning is a way to balance environmental, economic and social priorities.

Efficiency of LDN implementation within land use planning processes can be increased by managing trade-offs and synergies with other land-based targets, such as integrating land tenure security into national strategies and enhancing multi-stakeholder participation for effective implementation of integrated land use planning.

Take-home message

Integrated land use planning as well as inclusive and responsible land governance, are key enablers of LDN.

Keep land in balance requires an enabling environment which fosters multiple environmental, social and economic benefits.



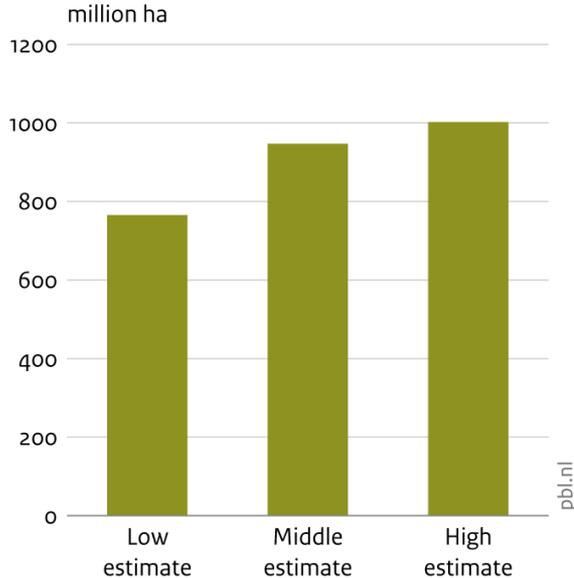
WHERE ARE
WE NOW?

Global Commitments

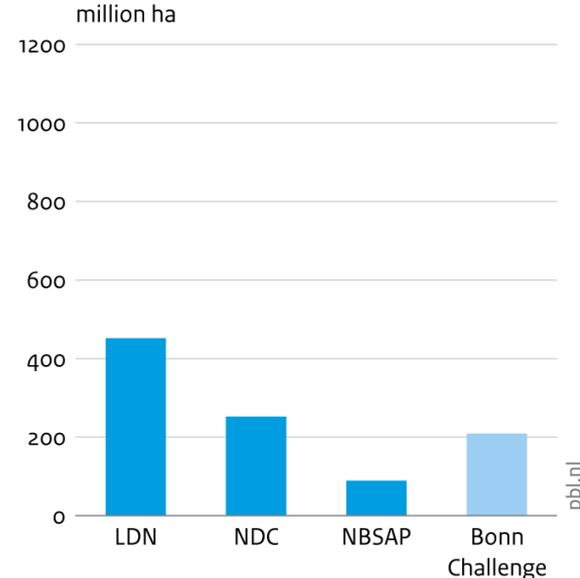


PBL Netherlands Environmental Assessment Agency

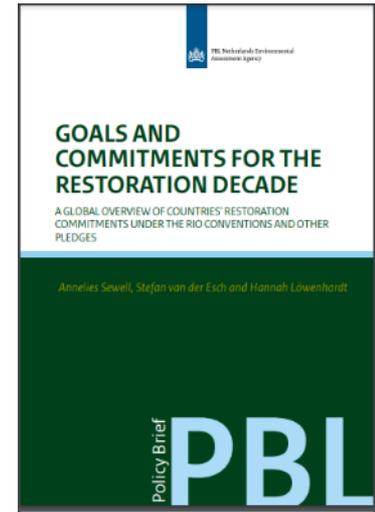
Total estimate range



Estimate per data source



- Total of national commitments under the Rio Conventions
- Total of national commitments under the Bonn Challenge and the associated regional initiatives



Global total of country restoration commitments:

- > **765 million – 1 billion hectares**
- > **115 countries**

Source: UNCCD, UNFCCC, CBD, Bonn Challenge; collected and adapted by PBL for Global Restoration Commitments database, August 2020

LDN targets set since 2017



**450 M ha
of ambition
so far...**

 Countries setting LDN targets

Disclaimer: Country names or borders shown on the map do not necessarily represent the UNCCD's official position. The map shown is simply for display purposes. It does not work to imply views or opinions of the UNCCD, regarding the legal status of any territory or country.

127 countries have committed to set LDN targets

104 of these have completed setting their LDN targets

70 of these have formal government-adopted targets

W

caps lock

A

S

Actions

Z

X

alt

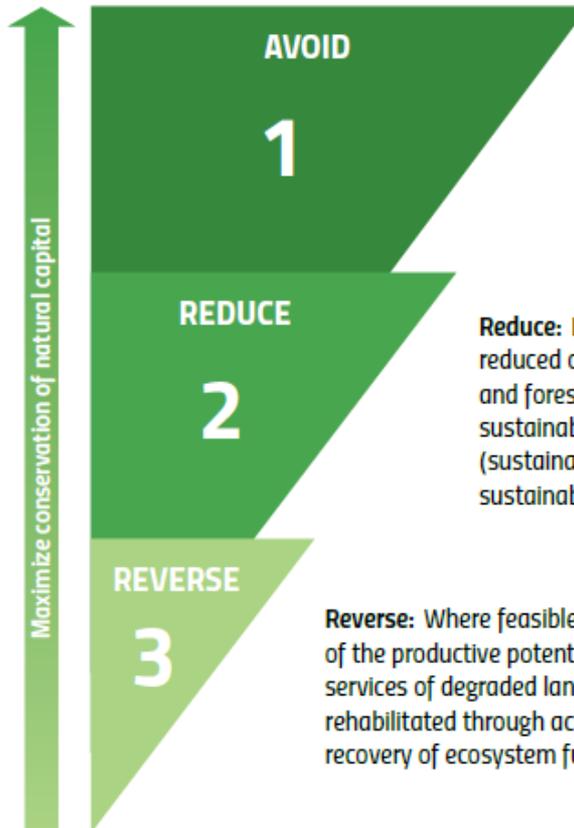
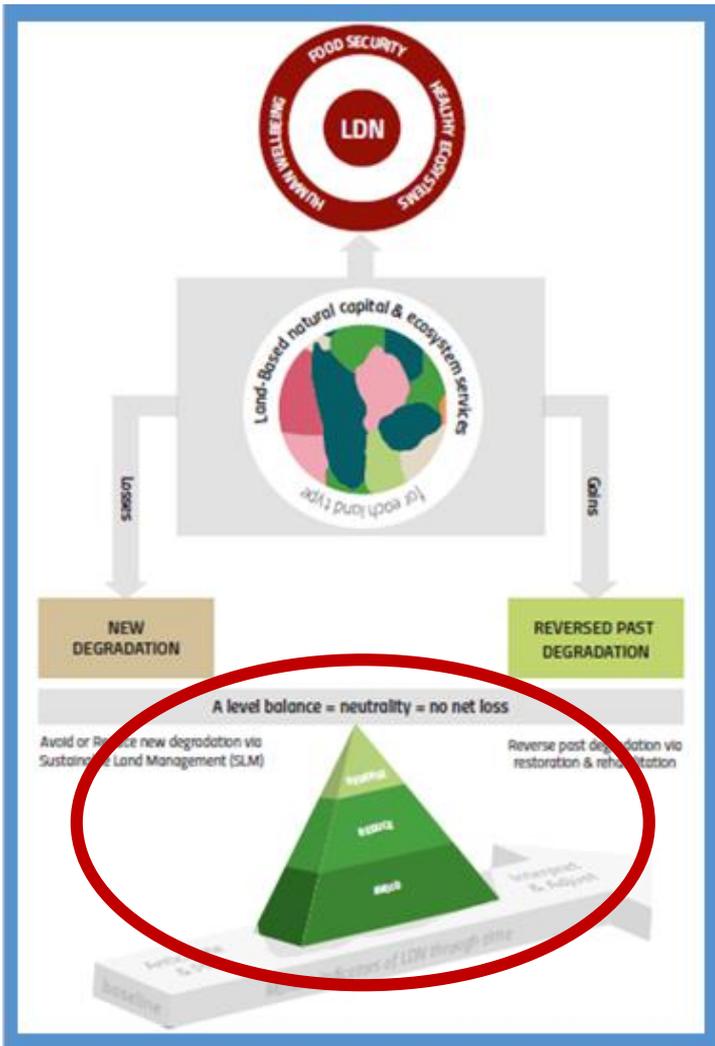


(Slide: Courtesy, Dr. Jim Skea, IPCC)

Action on Desertification and Land Degradation under Changing Climate

- Many activities for combating desertification and land degradation, such as through implementation of Land Degradation Neutrality (LDN) measures, contribute to climate change adaptation and mitigation, as well as to halting biodiversity loss with sustainable development co-benefits.
- Thus, the pursuit of LDN provides impetus to address land degradation and climate change simultaneously.

The LDN Response Hierarchy



Avoid: Land degradation can be avoided by addressing drivers of degradation and through proactive measures to prevent adverse change in land quality of non-degraded land and confer resilience, via appropriate regulation, planning and management practices.

Reduce: Land degradation can be reduced or mitigated on agricultural and forest land through application of sustainable management practices (sustainable land management, sustainable forest management).

Reverse: Where feasible, some (but rarely all) of the productive potential and ecological services of degraded land can be restored or rehabilitated through actively assisting the recovery of ecosystem functions.

Prevention is better than cure

INTEGRATED LDN RESPONSE ACTIONS

LDN is driving the integrated approach needed to halt the loss of healthy and productive land, and sustainably manage agroecosystems for present and future generations

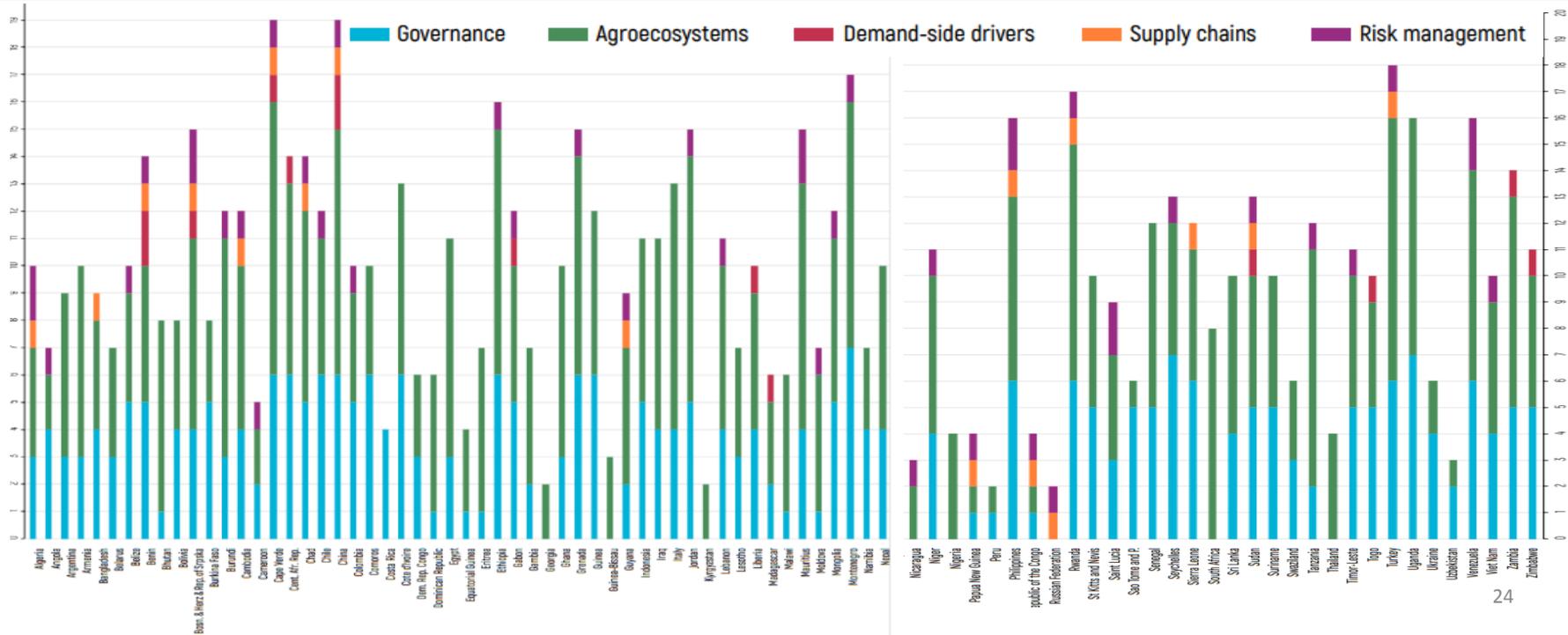
This analysis of national LDN reports identified a total of

842
Response Actions



in

86
Countries



Place-based approach

<p>PLACE</p>				
<p>APPROACHES</p>	<p>Cities/urban areas</p> <p>Green spaces and water management</p>	<p>Urban-rural interface</p> <p>Sustainable territorial development</p>	<p>Rural/agricultural landscapes</p> <p>Regenerative food and commodity production</p>	<p>Natural ecosystems/protected areas</p> <p>Conservation and restoration of nature</p>
<p>ENABLERS Rights (tenure security) / Rewards (incentives/investments) / Responsibilities (long term planning)</p>				
<p>ACTIONS</p>	<ul style="list-style-type: none"> » Community gardens and urban farming » Tree planting and wetland restoration » Green belts and buildings (roofs/walls) 	<ul style="list-style-type: none"> » Land use planning Protect watersheds and fertile farmland » Manage urbanization » Sectoral coordination for green infrastructure and supply chains 	<ul style="list-style-type: none"> » Integrated farming (crops/trees/livestock) » Rangeland management » Sustainable intensification and agroecological practices 	<ul style="list-style-type: none"> » Ecological restoration » Wildlife corridors and buffer zones » Indigenous/ community management » Sustainable harvesting in protected areas
<p>BENEFITS</p>	<ul style="list-style-type: none"> » Human health (quality of life) » Clean air and water » Flood control and wastewater management » Parks and recreation Cooler temperatures 	<ul style="list-style-type: none"> » Water availability for urban residents » Local and regional food security » Biodiversity conservation Reduced urban sprawl 	<ul style="list-style-type: none"> » Food security and rural livelihoods » Healthy soils and ecosystem functions » Reduced emissions » Water storage/recharge » Biodiversity conservation 	<ul style="list-style-type: none"> » Nature's contribution to people » Global public goods (climate stability/biodiversity) » Ecotourism and cultural landscapes

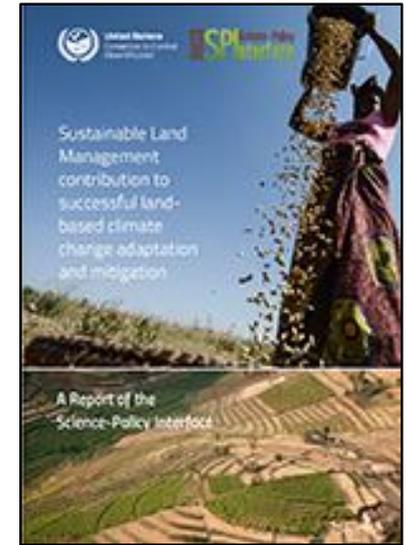
Sustainable Land Management

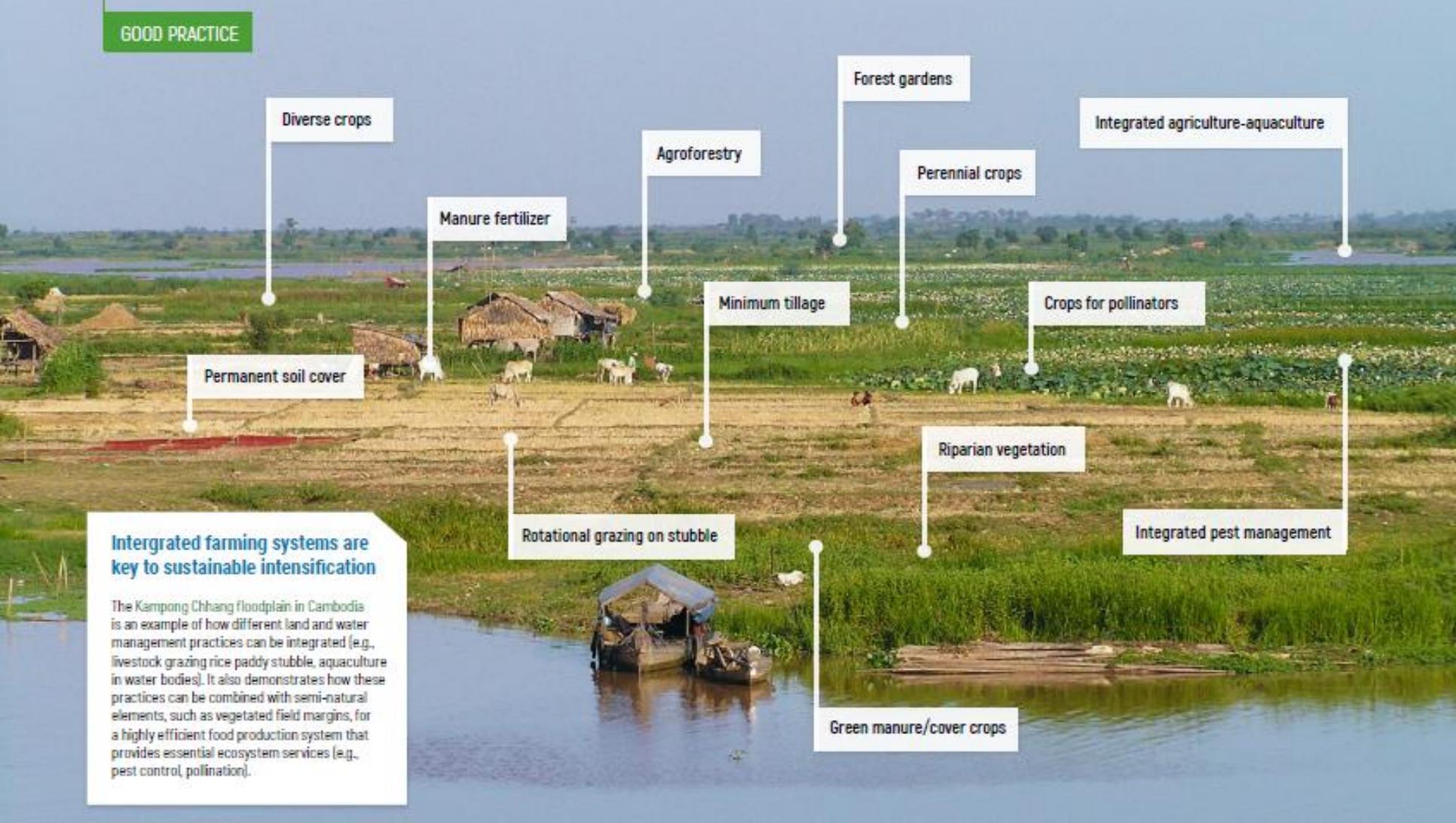


Slide: Courtesy, Dr. Annette Cowie)

Sustainable Land Management can be defined as the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions.

Source: WOCAT





Diverse crops

Forest gardens

Integrated agriculture-aquaculture

Agroforestry

Perennial crops

Manure fertilizer

Minimum tillage

Crops for pollinators

Permanent soil cover

Riparian vegetation

Rotational grazing on stubble

Integrated pest management

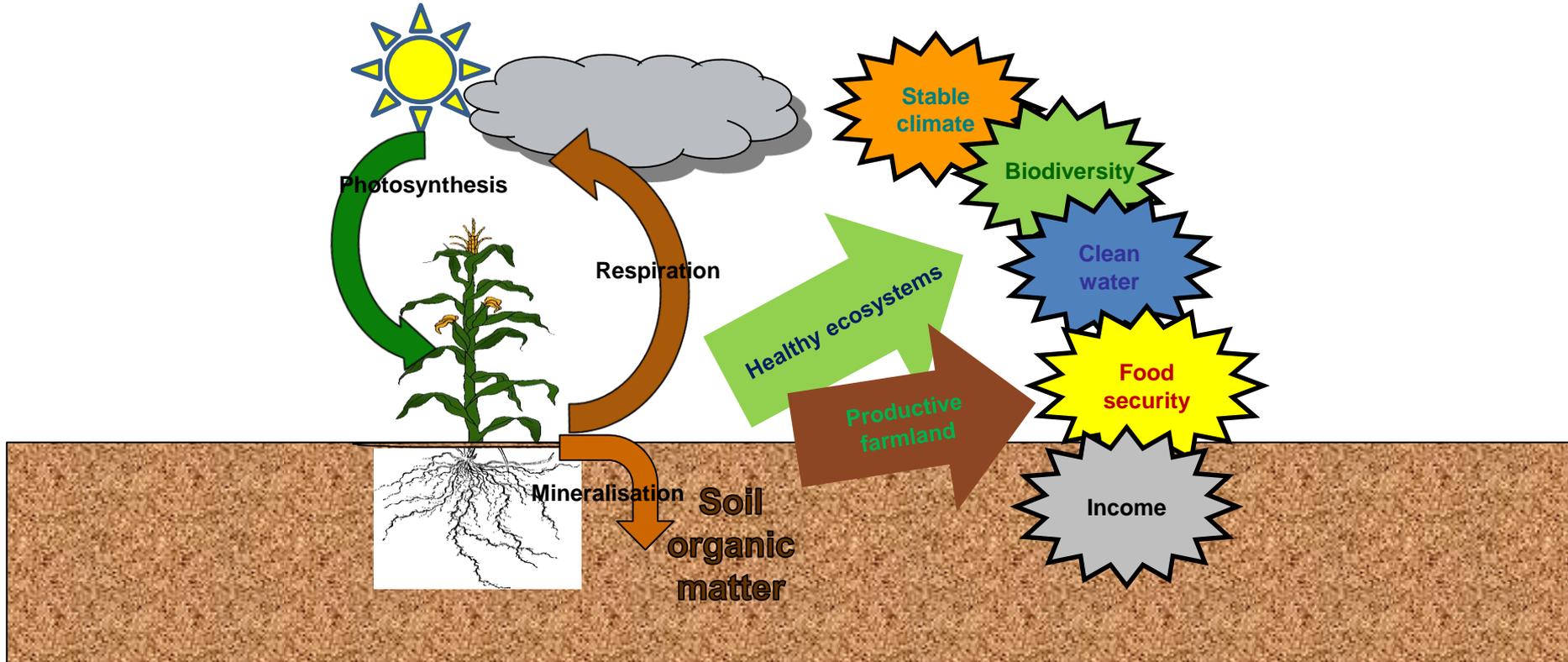
Integrated farming systems are key to sustainable intensification

The Kampong Chhang floodplain in Cambodia is an example of how different land and water management practices can be integrated (e.g., livestock grazing rice paddy stubble, aquaculture in water bodies). It also demonstrates how these practices can be combined with semi-natural elements, such as vegetated field margins, for a highly efficient food production system that provides essential ecosystem services (e.g., pest control, pollination).

Green manure/cover crops

Pivotal soil carbon

Carbon stored as soil organic matter builds healthy soil and sustains humanity



Soil carbon management

Theoretical potential sequestration: 2-5 GtCO₂/year

To build SOC

- Maintain plant cover
- Ameliorate soil constraints
- Minimise compaction, disturbance
- Retain stubble
- Enhance agro-biodiversity
- Apply organic amendments



(Slide: Courtesy, Dr. Annette Cowie)

The water, food, energy nexus: Integrated landscape management for biomass production with agriculture



(Slide: Courtesy, Dr. Annette Cowie)



**Desertification
& Drought Day**

17 JUNE
2021



Restoration. Land. Recovery.
We build back better with healthy land

Thank you!



United Nations
Convention to Combat
Desertification

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#DesertificationAndDroughtDay #RestorationLandRecovery

