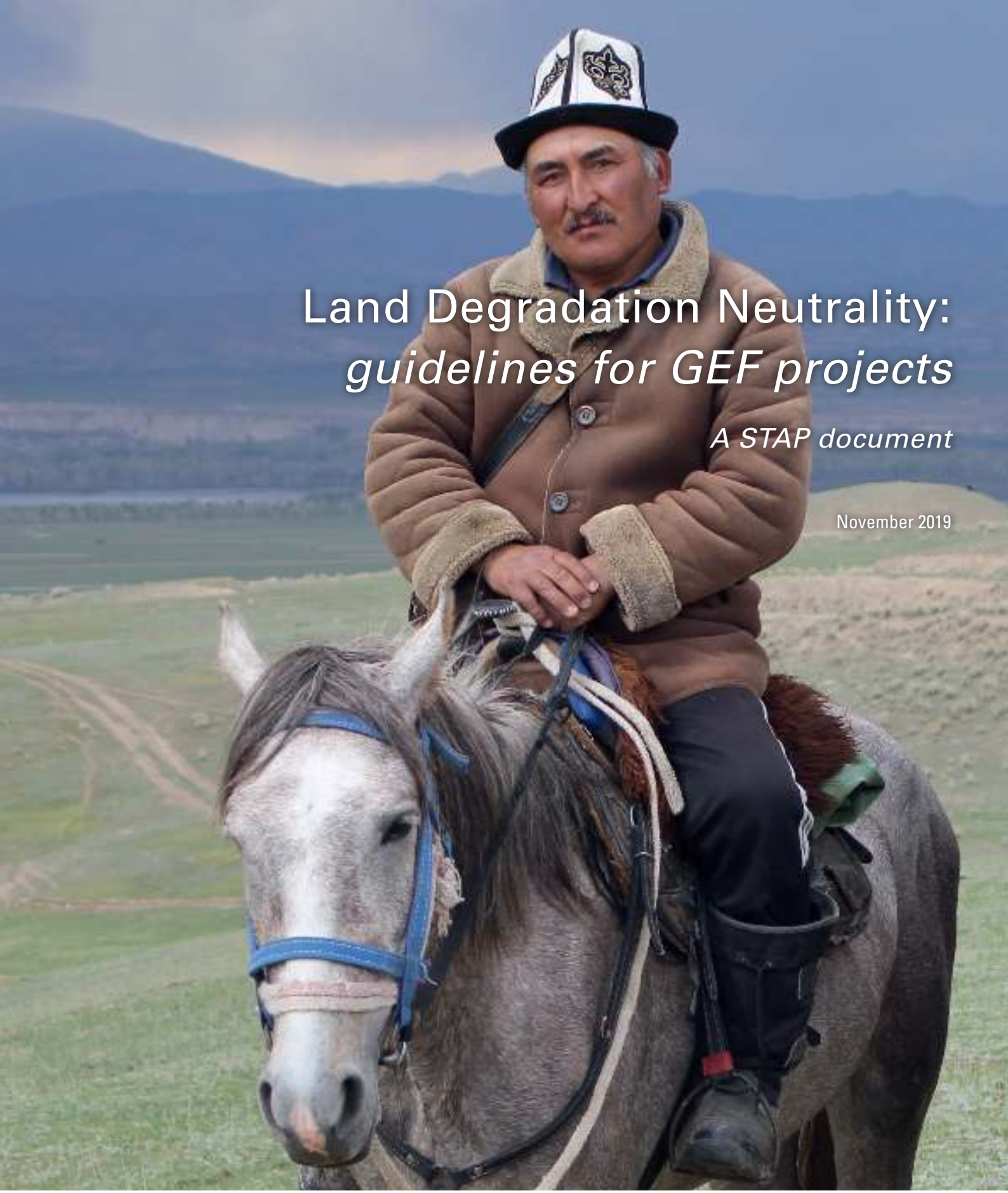

Land Degradation Neutrality: *guidelines for GEF projects*

A STAP document

November 2019

STAP
SCIENTIFIC AND TECHNICAL ADVISORY PANEL
An independent group of scientists that advises the Global Environment Facility

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UN environment programme

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by Jonathan Davies

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INTRODUCTION

The global context:

- by 2050, the global population is expected to be 9.7 billion, increasing the demand for agricultural produce including food, feed, fibre, and fuel
- about 25% of the total global land area has been affected by land degradation
- it is estimated that in the drylands, 12 million hectares of land are becoming degraded by desertification processes annually
- globally, 1.5 billion people are affected by land degradation, especially rural communities, smallholder farmers, and the very poor
- 70% of the world's poorest people live in rural areas and depend on agriculture for their livelihoods
- land and forest degradation threaten the livelihoods, well-being, food, water and energy security and increase the vulnerability of millions of people.

Pressures on the global land resource are increasing because of: the growing demand for food and agricultural commodities, both quantity and quality, for a growing and more affluent world population; competition for productive land for biofuel, urban expansion and other non-productive uses; decreasing or lack of growth in productivity due to declines in soil health; weakened resilience of agricultural production systems because of depleted biodiversity and ecosystem services; and natural factors such as climate variability and extreme weather events.

In 2012 the Rio+20 Earth Summit's political declaration, "The Future We Want," introduced the new concept of Land Degradation Neutrality (LDN), which was later adopted as a target of Goal 15 of the Sustainable Development Goals, Life on Land, "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation neutral world." Over 120 countries have committed to pursue voluntary LDN targets.

The objectives of LDN are to:

- maintain or improve the sustainable delivery of ecosystem services;
- maintain or improve productivity, in order to enhance food security;
- increase resilience of the land and populations dependent on the land;
- seek synergies with other social, economic and environmental objectives; and
- reinforce responsible and inclusive governance of land.

> LDN is defined as "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."
>
> *Decision 3/COP.12, UNCCD 2015*

The fundamental aim of LDN is to preserve the land resource base, by ensuring no net loss of healthy and productive land, at the national level. This goal can be achieved through a combination of measures that avoid, reduce and reverse land degradation (Fig 1). Achieving LDN requires estimating the expected cumulative impacts of land use and land management decisions, and counterbalancing anticipated losses through strategically-planned rehabilitation or restoration of degraded land, within the same land type.

> "GEF's mandate to invest in global environmental benefits from production landscapes relates directly to its role as a financial mechanism of the UNCCD. The Land Degradation Focal Area provides the opportunity for eligible countries to utilize GEF resources for implementing the Convention and its Strategic Framework 2018-2030."
>
> *GEF/A.6/05/Rev.01 June 2018, paragraph 151*

In GEF-7, the GEF is supporting LDN, including through the Impact Programs: Food Systems, Land Use and Restoration, by taking an integrated approach to implementing sustainable land management to increase the prospects for food security for smallholders and communities that are dependent on farming for their livelihoods; Sustainable Forest Management, by avoiding further degradation, desertification, and deforestation of land and ecosystems in drylands through the sustainable management of production landscapes; and Sustainable Cities, by creating opportunities for countries to integrate voluntary LDN targets into their urban planning.

The scientific conceptual framework for LDN (LDN-CF) provides the basis for planning, implementing and monitoring LDN. Figure 1 illustrates the relationship between the various elements of the conceptual framework.

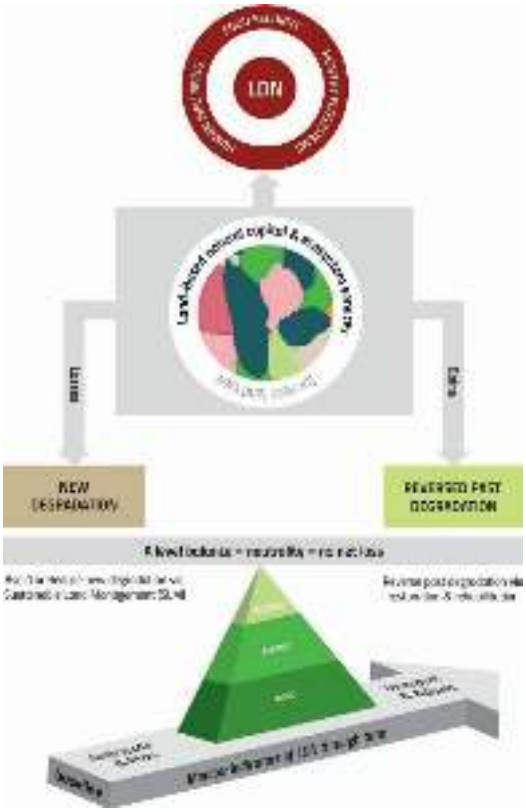

Figure 1 The overarching concept of LDN, the key elements of the conceptual framework, and their interrelationships. Source: Orr et al. 2017

"The target at the top expresses the **vision of LDN**, emphasizing the link between human prosperity and land-based natural capital, which provides a range of ecosystem services. The balance scale in the centre illustrates the **mechanism for achieving neutrality**: counterbalancing future land degradation (losses) with planned positive actions elsewhere (gains) within the same land type. The fulcrum of the scale depicts the **hierarchy of responses**: avoiding degradation is the highest priority, followed by reducing degradation and finally reversing past degradation."[1]

The framework[2] has five modules (Fig 2) which describe the overall approach to implementing LDN interventions:

- A - articulates the goal and objectives of LDN;
- B - explains the baseline against which achievement is measured;
- C - explains how to counter balance expected losses;
- D - creates an enabling environment, and undertakes some preliminary assessments; and
- E - outlines indicators for assessing the achievement of LDN and monitoring neutrality.

These guidelines offer practical help in developing GEF projects which contribute to Land Degradation Neutrality. They focus on laying the foundation to achieve LDN through integrated land use planning and preparatory assessments, and by identifying enabling policies. The guidelines are not prescriptive, and offer practical principles for applying each module.

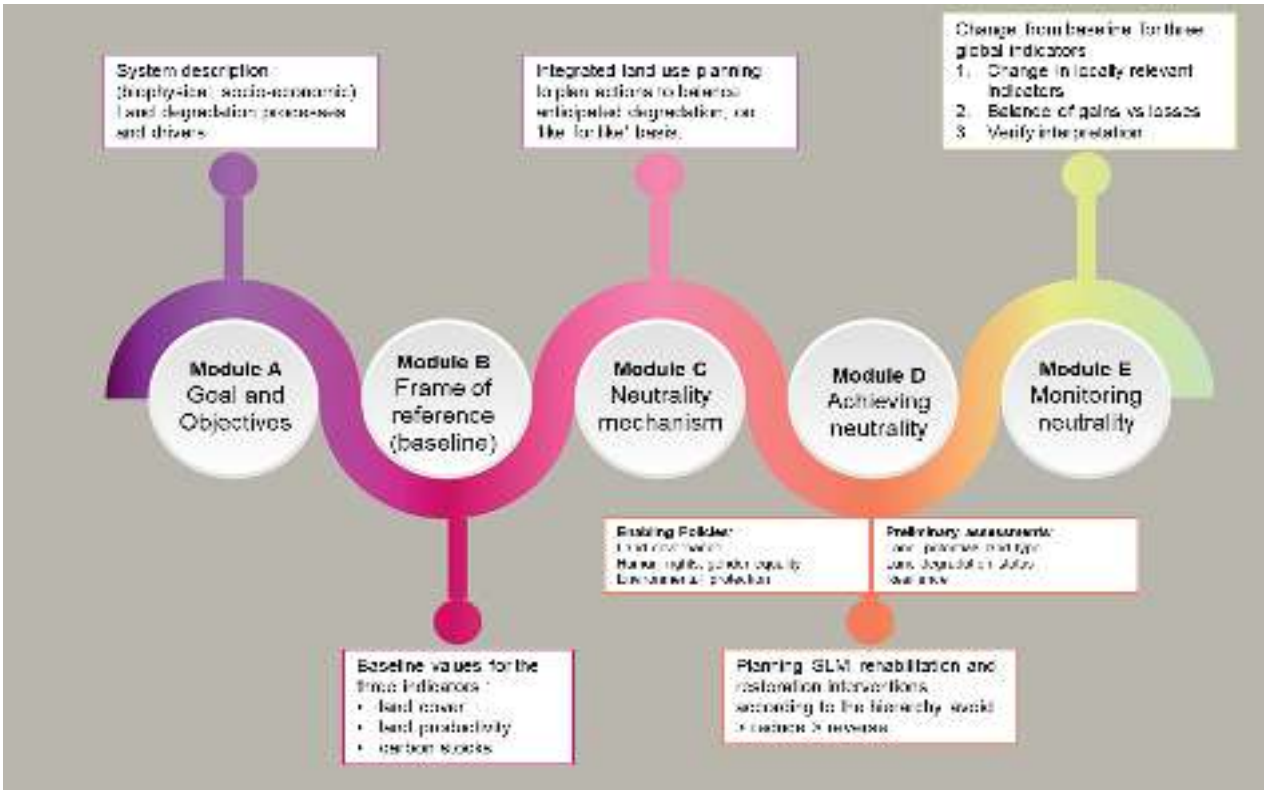

Figure 2 The five modules of the conceptual framework. Source: Graciela Metternicht, 2019.

Module A: The goal and objectives of LDN

The goal of LDN is to maintain the land resource base so that it can continue to supply ecosystem services, such as provision of food and regulation of water and climate, while enhancing the resilience of the communities that depend on the land.

Put simply, the goal of LDN is to maintain or increase the amount of healthy and productive land.

Principles of Module A

P1 Maintain or enhance land-based natural capital.

P2 Protect the rights of vulnerable and marginalised land users.

P3 Set national LDN targets based on national circumstances.

Steps for Module A

1. Characterise the system through a participatory process with key stakeholders.

2. Describe the key biophysical and socio-economic features of the system including its boundaries. What valued ecosystem services and ecological functions are provided by the land?

3. Identify the land degradation processes. What forms of land degradation are affecting productivity and natural ecosystems? For example, soil erosion including loss of topsoil, gullying, soil salinization, coastal inundation, and bush encroachment.

4. Identify the drivers of land degradation, i.e. external influences that lead to land degradation (drought, migration, market forces), and the pressures, such as land use change (e.g. forest conversion to agriculture, urban expansion) and unsustainable land use practices (e.g. overgrazing, burning crop stubble, intensive cultivation on slopes) that leave soil bare and vulnerable to erosion.

Module B: The baseline against which progress towards land degradation neutrality is measured

Key concepts

- Neutrality is achieved when losses are counterbalanced by gains so there is no net loss of the land-based natural capital relative to the baseline, i.e. the baseline is also the (minimum) target.

- The baseline is measured by the values of three global LDN indicators when the decision is made to commit to LDN.

- The indicators are land cover change (LCC), net primary (land) productivity (NPP), and soil organic carbon (SOC) stocks:

- LCC detects the human actions that drive land degradation and its reversal
- NPP reflects the impacts of those drivers on plant production as a measure of ecosystem function
- change in SOC stocks indicates the change in productive capacity.

Principles of Module B

P4 For neutrality, the LDN target equals, i.e. is the same as, the baseline.

P5 Neutrality is the minimum objective: countries may elect to set a more ambitious target, but in some countries this may be unachievable.

Steps for Module B

1. Identify data sources for the three global indicators.
2. Determine the baseline year, either the year in which the country committed to LDN, or the year in which planning for the project began.
3. Determine the baseline value for each indicator, usually these are averaged over a multi-year period (10-15 years) because indicator values fluctuate.
4. The baseline becomes the minimum target to strive to achieve by 2030.

Module C: The mechanism for neutrality counterbalances anticipated degradation with action to avoid losses elsewhere, to ensure that land degradation neutrality is achieved

Key concepts

- Neutrality requires action to reverse degradation and to counterbalance any losses due to ongoing land degradation.
- Land managers should monitor land use decisions which might affect LDN, to estimate the likely cumulative effects – so that these can be counterbalanced by reversing land degradation on the same land type, elsewhere, through rehabilitation or restoration.
- Land in the baseline which is already degraded and remains degraded does not count as a loss.
- Land degradation can occur quickly, for example, when land is cleared, wetlands are drained, land is converted to settlements, and floods wash away topsoil, or it can develop gradually, for example, when acidification gradually reduces productivity.
- Reversing degradation is usually a slow process.

- Protecting an area that is currently undegraded does not generate gains because the value of the indicators remains constant over time - so this does *not count towards counterbalancing* degradation. However, protecting an undegraded area that is vulnerable to loss (for example, forest that would have been cleared) is a legitimate LDN intervention when planning actions *to avoid losses*. Therefore, funding such actions is important, as part of the response hierarchy (see Module D).

Principles of Module C

P6 Integrate planning and implementation of LDN into existing land use planning processes.

P7 Counterbalance anticipated losses in land-based natural capital with interventions to reverse degradation, to achieve neutrality.

P8 Manage counterbalancing at the same scale as land use planning.

P9 Counterbalance "like for like" (within the same land type).

Steps for Module C

1. Apply integrated land use planning that embeds the neutrality mechanism; this will help in categorizing and accounting for land use decisions and the impacts of land use and management.

2. Quantify projected land degradation: estimate cumulative losses resulting from individual land use and management decisions, e.g. due to anticipated land use changes, such as planned urban expansion, and anticipated unsustainable management.

3. Plan gains to counteract anticipated losses "like for like", because each land type has a different potential to deliver ecosystem services. Each land type needs to be managed for neutrality, to achieve neutrality at the national level.

4. Ensure that counterbalancing does not occur between protected areas and land managed for productive uses.

5. Ensure that counterbalancing measures do not diminish the wellbeing of land users.

Module D: Achieving neutrality requires an enabling environment, and some preliminary assessments

Key concepts

- Success requires an enabling environment, i.e. a combination of institutional capacity, financial resources, policy and regulatory mechanisms, and science-policy interaction.

- Land managers are more likely to invest time and financial resources in land if their livelihood assets are sufficient and secure. A key enabler is therefore responsible land governance, including measures to secure access to land.

- Providing individual freehold title is not always the optimal solution: formalising communal land governance may be more effective in some cases.

- Policy coherence is critical, between institutions, sectors, and levels of governance, to resolve fragmentation, lack of connectivity, and conflicting interests.

- Integrating LDN planning and implementation with other relevant processes will increase efficiency in achieving multiple objectives, and minimise trade-offs and unintended adverse impacts.

- Preparatory assessments provide the knowledge base to inform planning of interventions: assessments of land potential, resilience of current and proposed land use.

- Choosing the right intervention to apply in the right place requires biophysical data, socio-economic data and methods/tools to predict outcome, e.g. soil organic carbon modelling.

Principles of Module D

P10 Seek solutions that provide multiple environmental, economic and social benefits, and minimise trade-offs.

P11 Base land use decisions on multi-variable assessments, considering land potential, land condition, resilience, social, cultural and economic factors.

P12 Apply the response hierarchy in devising interventions for LDN: Avoid > Reduce > Reverse land degradation.

P13 Apply a participatory process: include stakeholders, especially land users, in designing, implementing and monitoring interventions to achieve LDN.

P14 Reinforce responsible governance: protect human rights, including tenure rights; develop a review mechanism; and ensure accountability and transparency.

Steps of Module D

1. Review policies for land governance, land use planning and natural resource conservation and management, and revise, where required, to provide an effective policy framework for the implementation of LDN[3].

2. Gather required data, and undertake preliminary assessments on[4]:

    - Land potential and land stratification

    - Current land degradation status

    - Resilience of current and proposed land uses

    - Cost-benefit analysis of proposed interventions

3. Apply integrated land use planning, which balances economic, social/cultural and environmental objectives, to achieve a mosaic of land uses across the landscape, so that land is used for the purposes to which it is best-suited[5].

Module E: Monitoring progress towards achieving land degradation neutrality

Key concepts

- Monitoring involves tracking the change in the global LDN indicators (land cover change LCC, net primary productivity NPP, and soil organic carbon SOC) relative to the baseline value, for each land unit.
- The indicators are applied using a "one-out, all out" approach, i.e. a negative change in any of the three indicators is interpreted as a loss.
- Negative change counts as a loss, irrespective of whether it is due to direct human action or indirect, e.g. climate change, human action, or natural factors.
- It is important to determine whether the changes in indicators result from climatic variation rather than land degradation, in order to focus interventions accordingly.

Principles of Module E

P15 Monitor using the three global indicators: land cover, land productivity, and carbon stocks.

P16 Use a "one-out, all-out" approach to interpret the result of these three global indicators.

P17 Use additional national and sub-national indicators to aid interpretation and to fill gaps for ecosystem services not covered by the three global indicators.

P18 Apply local knowledge and data to validate and interpret monitoring data.

P19 Apply a continuous learning approach: anticipate, plan, track, interpret, review, adjust, and create the next plan.

Steps for Module E

1. Decide how to interpret changes in land cover (positive, negative, stable).
2. Some land cover transitions are universally agreed to be negative, e.g. conversion of tropical peatland forest to cropping or settlements. Others are ambiguous, e.g. conversion of pasture to forest in rangelands; this could result from woody shrub encroachment (adverse effects on livelihoods), but likely to have higher NPP and carbon stock in vegetation, and possibly also in soil. Some stakeholders may view the same transition as a positive change.
3. Where the interpretation is somewhat subjective, and/or trade-offs are involved, a participatory process involving local stakeholders will be required to reach a decision on interpretation.

4. Verify interpretation using on-ground observations or high-resolution imagery, e.g. proximal sensing using drones. Crowd-sourcing could be used for verification of imagery; citizen science could be helpful to engage the community in on-ground verification of aspects such as weed incursions or monitoring water quality.

5. Consider the need for additional indicators. Are there important land degradation processes that are not captured? For example, heavy metal contamination from mining, salinization from inefficient irrigation, surface sealing from urban expansion and densification, loss of habitat of threatened species.

6. Gains are often slow to accumulate to a detectable level. Process-based indicators can be used to record activity which is expected to deliver future gains, e.g. the proportion of landholders retaining crop stubble, or ploughing along contour.

7. Establish a plan for regular monitoring of the global and local indicators, at approximately 4-year intervals.

8. Establish a knowledge management platform as a repository and mechanism for sharing and verification of monitoring data.

9. LDN is achieved if the area of gains at least matches the area of losses within each land type.

10. Be aware that the "area for area" exchange may not fully compensate losses, over the timeframe of the target, because soil carbon is slow to accumulate.

GLOSSARY:

Land potential: The inherent, long-term potential of the land to generate ecosystem services sustainably (UNEP, 2016), which reflects the capacity and resilience of the land-based natural capital, in the face of environmental change.

Land type: Class of land with respect to land potential, which is distinguished by the combination of edaphic, geomorphological, topographic, hydrological, biological and climatic features that support the actual or historic vegetation structure and species composition on that land. Used in counterbalancing "like for like".

Land use: Type of activity being carried out on a unit of land, in urban, rural and conservation settings (IPCC, 2006).

Land unit: Finest resolution spatial unit used in LDN planning and monitoring.

Like for like: Refers to the principle of counterbalancing losses in one land type with equivalent (or greater) gains in the same land type elsewhere in order to maintain (or exceed) LDN.

BIBLIOGRAPHY

Bryan, B. A. et al. Land-use and sustainability under intersecting global change and domestic policy scenarios: trajectories for Australia to 2050. Glob. Environ. Change 38, 130–152 (2016).

Campbell EE and Vlek P 2019 Managing SOC as an indicator of LDN and for additional benefits using SLM. Report to the UNCCD Science Policy Interface.

Cowie, A. (2019). Guidelines for the application of the Scientific Conceptual Framework for Land Degradation Neutrality.

Cowie, A. L., B. J. Orr, V. M. C. Sanchez, P. Chasek, N. D. Crossman, A. Erlewein, G. Louwagie, M. Maron, G. I. Metternicht and S. Minelli, 2018: Land in balance: The scientific conceptual framework for Land Degradation Neutrality. Environmental Science & Policy 79, 25-35.

Grigg N, Abel N, O'Connell D, Walker B (2015) Resilience assessment desktop case studies in Thailand and Niger. CSIRO, Australia.

ITPS. 2015. Status of the World's Soil Resources. Prepared by Intergovernmental Technical Panel on Soils (ITPS) for the Food and Agriculture Association of the United Nations (FAO), Rome. Available online: http://www.fao.org/documents/card/en/c/c6814873-efc3-41db-b7d3-2081a10ede50/

O'Connell D, Abel N, Grigg N, Maru Y, Butler J, Cowie A, Stone-Jovicich S, Walker B, Wise R, Ruhweza A, Pearson L, Ryan P, Stafford Smith M (2016) Designing projects in a rapidly changing world: Guidelines for embedding resilience, adaptation and transformation into sustainable development projects. (Version 1.0). Global Environment Facility, Washington, D.C.

Orr, B., A. Cowie, V. Castillo Sanchez, P. Chasek, N. Crossman, A. Erlewein, G. Louwagie, M. Maron, G. Metternicht and S. Minelli (2017) Scientific conceptual framework for land degradation neutrality.

Sims, N.C., Green, C., Newnham, G.J., England, J.R., Held, A., Wulder, M.A., Herold, M., Cox, S.J.D., Huete, A.R., Kumar, L., Viscarra Rossel, R.A., Roxburgh, S.H., McKenzie, N.J., 2017. Good Practice Guidance. SDG Indicator 15.3.1, Proportion of Land That Is Degraded Over Total Land Area (p. 115). United Nations Convention to Combat Desertification, Bonn, Germany. http://www2.unccd.int/sites/default/files/relevant-links/2017-10/Good%20Practice%20Guidance_SDG%20Indicator%2015.3.1_Version%201.0.pdf

Sims, N.C., England, J.R., Newnham, G.J., Alexander, S., Green, C., Minelli, S. and Held, A., 2019. Developing good practice guidance for estimating land degradation in the context of the United Nations Sustainable Development Goals. Environmental Science & Policy, 92, pp.349-355.

UNCCD 2016 Methodological note to set national voluntary Land Degradation Neutrality (LDN) targets using the UNCCD indicator framework Available at: https://knowledge.unccd.int/sites/default/files/2018-08/LDN%20Methodological%20Note_02-06-2017%20ENG.pdf

UNCCD SPI 2019a Creating an Enabling Environment for Land Degradation Neutrality and its Potential Contribution to Enhancing Well-being, Livelihoods and the Environment.

UNCCD SPI 2019b Soil carbon benefits of Sustainable Land Management Practices.

Endnotes

1 Orr, et al (2017). Scientific Conceptual Framework for Land Degradation Neutrality.
2 This is based on Guidelines for the application of the "Scientific Conceptual Framework for Land Degradation Neutrality" written by Annette Cowie, and commissioned by GEF STAP: http://www.stapgef.org/guidelines-land-degradation-neutrality
3 Cowie, A. (2019). Module D1 Developing an enabling environment, Appendix 1.
4 Cowie, A. (2019). Module D2 Preparatory assessments, Appendix 2.
5 Cowie, A. (2019). Module D3 Planning interventions, Appendix 3.

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