

LAND DEGRADATION NEUTRALITY – A NEW IMPETUS FOR ADDRESSING THE DEGRADATION OF LAND AND SOILS

With the target on Land Degradation Neutrality (LDN) the Sustainable Development Goals have created new political momentum to address land degradation. The UN Convention to Combat Desertification adopted LDN as its central objective and supports countries in defining national targets to avoid degradation and restore degraded land. This provides an opportunity to advance action against land and soil degradation on national agendas, reform respective policy instruments and mobilise additional funding.

By Alexander Erlewein and Antje Hecheltjen

Land degradation is an increasingly severe global environmental and development problem. Each year an additional area of 12 million hectares of agricultural land get degraded and soil erosion amounts to an estimated 24 billion tons (3 tons per capita). The manifestations of land degradation are diverse and context-specific, but are always characterised by the degradation of soil, vegetation and/or water resources – predominantly through unsustainable forms of land use. This results in a massive loss of ecosystem services, with the reduction in agricultural productivity being a main concern. The increasing degradation of land and soils is therefore a major threat to food security and the resilience of rural communities while contributing to climate change and biodiversity loss. In total, the estimated annual costs of land degradation world-wide amount to 400 billion US dollars.

A NEGLECTED PROBLEM

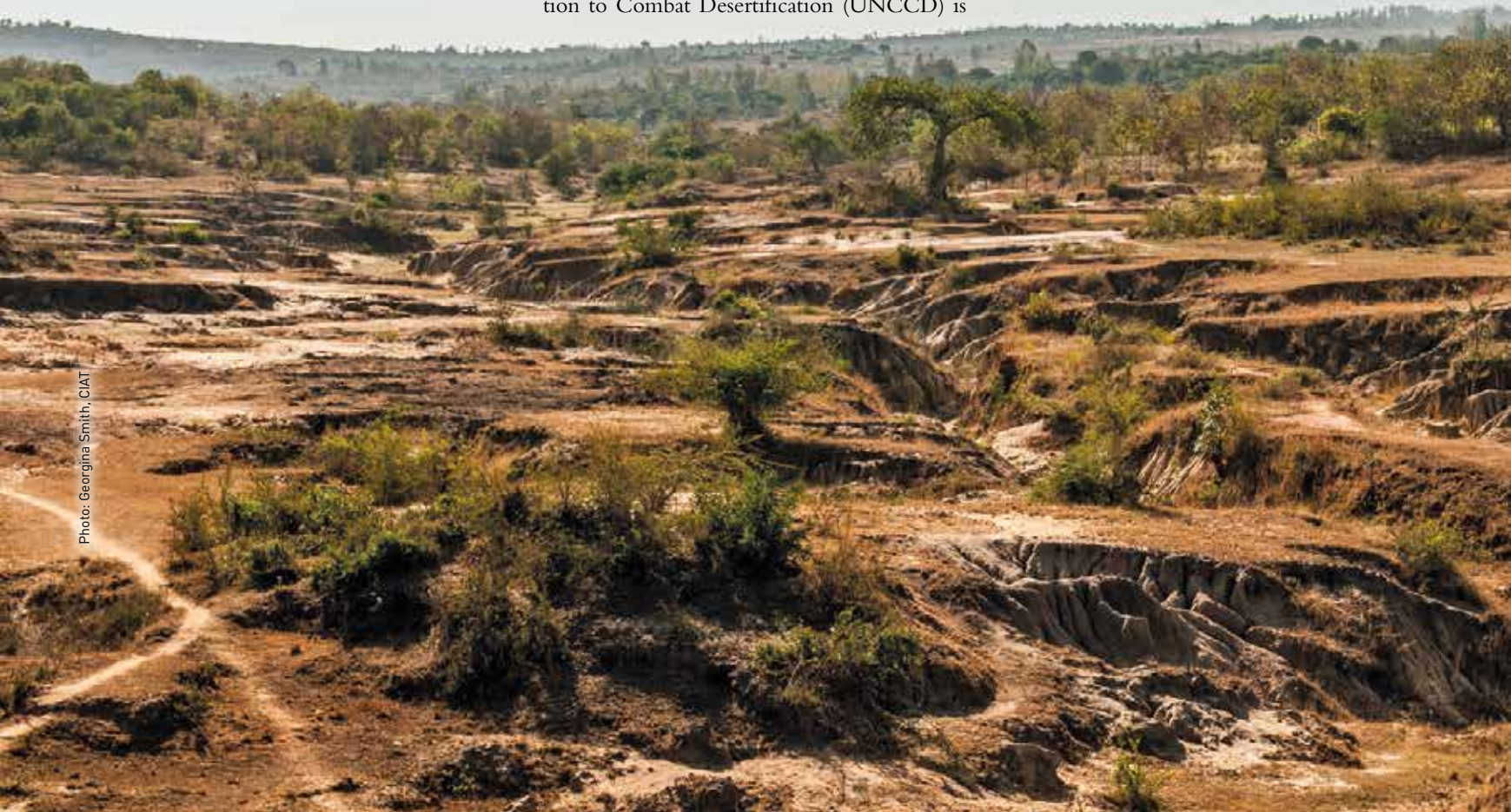
Irrespective of the fundamental challenge that land degradation poses to rural development in many parts of the world, awareness among the public and policy-makers is generally low. Soil continues to be a neglected resource whose degradation usually takes place slowly and only becomes visible at a late stage. Moreover, land and soil are often perceived as private property rather than public goods, while political responsibility cuts across the agricultural and environmental ministries. Whereas the agricultural sector tends to perceive soil fertility as a mere function of input supply, the environmental sector largely reduces land degradation to land cover change, with a focus on deforestation.

At the international level, the UN Convention to Combat Desertification (UNCCD) is

the only legally binding international agreement to address land and soil degradation. Despite being one of the three Rio Conventions, the actual influence of the UNCCD has been limited in the past. This may be explained by its formally restricted mandate on land degradation in drylands, i.e. desertification, and a regional focus on Africa. More importantly though, the convention lacks a clear and quantifiable target.

AWARENESS OF LAND DEGRADATION IS GROWING

However, attention has been growing over the last few years. A number of international initiatives (such as the Global Soil Week, the Food and Agriculture Organization's Global Soil Partnership or the Economics of



Land Degradation Initiative) as well as several high-ranking scientific assessments have raised the awareness of decision-makers. A particularly important step was the integration of land and soil degradation into Agenda 2030. SDG target 15.3 stipulates to “combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030”. This target started to gain significant political momentum when the 12th Conference of the Parties to the UNCCD decided to make LDN the central objective for the convention in 2015.

WHAT IS LAND DEGRADATION NEUTRALITY?

Land degradation neutrality (LDN) is first of all an **aspirational target**. Similar to the role of the two degree target in global climate policy, LDN serves as a common overarching goal to address a global environmental problem, giving orientation to the UNCCD process and providing a joint vision for the often fragmented strategies to address land degradation. Constituting benchmarks to which countries and the international community can be held accountable for politically, targets aim to eventually spur action.

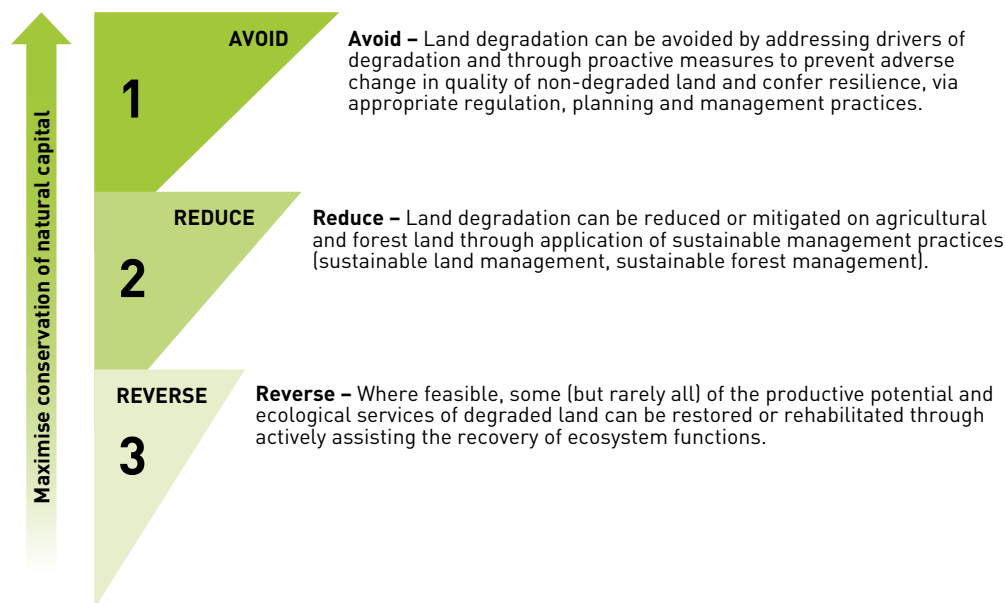
Secondly, LDN is a **concept**, defined as “a state whereby the amount and quality of land resources necessary to support ecosystem functions [...] remain stable or increase”. Thus, LDN is achieved if there is no net loss (or a gain) of land resources compared to a baseline (e.g. 2015). Such a balance can be achieved through avoiding, reducing and reversing land degradation. The LDN response hierarchy (see Figure) underlines the need to prioritise the avoidance of land degradation while making use of the large areas of degraded land that holds potential for restoration.

Thirdly, LDN is a **monitoring approach** that allows for tracking progress on the implementation of LDN targets (see Box on page 35).

TRANSLATING A GLOBAL GOAL INTO NATIONAL AMBITIONS: LDN TARGET SETTING

Based on these considerations, the UNCCD has started a LDN target-setting programme that aims to bring the global goal of LDN down to the country level. Since its start in 2015, 115 countries have joined the programme with the objective to formulate vol-

The LDN response hierarchy



Source: Scientific Conceptual Framework for Land Degradation Neutrality. A Report of the Science-Policy Interface. UNCCD, 2017.

untary national targets on reducing land degradation and rehabilitating degraded land. So far, 60 countries have set LDN targets, some with rather general goals for achieving a state of no net loss in 2030 or at an earlier or later date and others with specific quantitative targets. For example, Senegal aims to annually improve 5 per cent of the land under degradation until 2030, while Namibia has committed to reduce bush encroachment on 1.9 million hectares by 2040 (see also article on pages 36–37).

Such ambitions may overlap with other already existing ones for forest and landscape restoration (AFR 100, 20x20 etc.) or climate action (Nationally Determined Contributions). The LDN target-setting programme explicitly encourages such linkages as they provide leverage for political and financial support.

DIFFERENT PATHWAYS FOR IMPLEMENTING LDN

With a growing number of countries having set LDN targets, the challenge increasingly becomes one of implementation. Bold targets need to be translated into policies and projects that actually improve the way land is managed on the ground. There are two main approaches for countries to implement LDN targets. One is policy-oriented and aims to mainstream LDN into existing land use regulation. In this respect, the LDN mitigation hierarchy (avoid, reduce, reverse) can serve as a guiding principle for land use planning. The other implementa-

tion pathway is more project-oriented aiming at the roll-out of additional programmes for sustainable land management and rehabilitation in degradation hotspots. Such strategies are more concrete and help to achieve tangible results, although they are also more limited in scope and may not address the need for policy reform. A combination of policy and project-oriented approaches is clearly best suited to successfully implement LDN targets.

Obviously, many existing programmes and projects already contribute to achieving national LDN targets, particularly those working on landscape restoration, agroforestry, watershed management, soil rehabilitation or erosion control. They should be made visible and may help to identify scalable best practices and increase the ambitiousness of LDN targets. An LDN target a country has set can be an opportunity to advance necessary reforms of policy and planning instruments as well as to foster the often lacking co-operation between agricultural and environmental authorities.

PROMISING EXAMPLES AND OBSTACLES

Experience from countries following an LDN approach is diverse. The number of countries participating in the LDN target setting programme, now including global players such as China, India and Brazil, clearly exceeds expectations. However, the political relevance of LDN targets varies. While some countries of-

MONITORING LAND DEGRADATION NEUTRALITY

What is the status of land degradation and land rehabilitation worldwide? Has it improved or worsened? Where are degradation hotspots and anticipated losses located? Where should a country plan measures to avoid, reduce, or reverse land degradation?

To answer these questions, decision-makers need spatial data. Freely available satellite imagery in combination with in-situ observations provide reliable data with global coverage and high repetition rates, enabling retrospective and current analysis. Most countries, however, are not yet exploiting the potential of data for monitoring, reporting and planning purposes. Therefore, the UNCCD, together with its partners, supports all country parties by providing readily processed data to each country as well as free tools for visualising and processing their own data and by building capacities through regional workshops.

Data for reporting

In 2018, parties to the UNCCD will report for the first time on the following three agreed quantitative indicators in a uniform approach that allows the spatially explicit estimation of changes in land degradation and restoration (see Figure):

- Land productivity
- Land cover change
- Soil organic carbon (SOC)

The three indicators are a minimal consensus to quantify land degradation. From a scientific point of view, more sophisticated approaches exist to estimate land degradation. For monitoring, however, an approach was needed that is (a) accepted by all country parties and (b) operational at global level. That this consensus was reached and that monitoring is now operational is a huge step forward for the Convention. Countries are explicitly invited to add country-specific indicators and national data where needed.

Their choices on data will always be a compromise between (a) global comparability and (b) national relevance to inform national decision-making on resource management and land use planning.

The same indicators used for the UNCCD reporting process will also serve for reporting on SDG 15.3 on LDN, avoiding duplication of efforts; however, some countries are still struggling aligning the two reporting processes. The required information flow between UNCCD national focal points and national statistical offices as well as the acceptance of geospatial data by statisticians can be challenging.

ficially endorsed their targets, others consider them to be more informal. Targets formulated by environment ministries without the participation of their agricultural counterparts are a recurrent obstacle.

LDN explicitly calls for cross-sectoral collaboration, and most targets can only be implemented by improving agricultural practices, incentives and advisory services. A promising example in this regard is Costa Rica, which already passed a directive that requires all ag-

ricultural and environmental policies and plans to integrate LDN. In Benin, the LDN process has triggered a continuous inter-ministerial dialogue on sustainable soil management, supported by a bilateral soil rehabilitation project that provides best-practice examples.

Many countries follow a pragmatic approach and use their recently set LDN targets as an argument to access additional funding for project proposals. In fact, the Global Environmental Facility (GEF) recently made LDN the cor-

nerstone of its focal area on land degradation and significantly increased respective funding volumes. A number of GEF financed LDN projects have already been approved (e.g. in Georgia, Lebanon, Namibia and Turkey), usually combining on-the-ground implementation with activities to integrate LDN elements in policy processes. Another emerging funding opportunity is the recently launched LDN Fund that aims to mobilise private sector investments for profit-oriented projects with high environmental and social benefits.

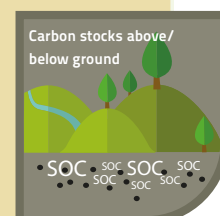
FRAMEWORK FOR MONITORING AND REPORTING

SDG Indicator 15.3.1

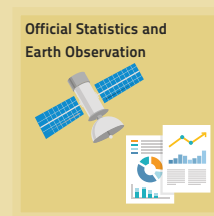
Proportion of land that is degraded over total land area



Sub-Indicators UNCCD (CBD, UNFCCC) Reporting Mechanisms



Data from multiple sources



Source: UNCCD

Data for decision-making

Besides reporting, the data will serve as a basis for policy-making by informing land use planning with the aim to optimise the location of interventions and the type of interventions. Namibia, for example, used national data on the three indicators plus bush encroachment as a country-specific indicator to inform the integrated regional land use planning (IRLUP) process. Data on bush encroachment was especially useful, while the interpretation of SOC data proved difficult. To ensure maximum exploitation of the potential of the data for planning processes, capacity building should target both reporting officers and technical staff for land use planning.

Synergies and inter-sectoral co-operation

The three indicators – especially land cover change – are also relevant for reporting and decision-support for other SDGs and international agreements and target systems such as AFR100, the Sendai framework for disaster risk reduction, or Nationally Determined Contributions (NDCs). Inter-sectoral co-operation is thus of utmost importance to maximising synergies and avoiding duplication of efforts for monitoring, assessment, planning and implementation to move towards a land degradation neutral world.

SUMMING UP...

Undoubtedly, LDN has given the global agenda on land degradation a new boost. It provides a joint vision and monitoring approach for the fragmented policy field of land and soil degradation and encourages a significant number of countries to put these topics higher on the political agenda. This offers an opportunity to advance action against land and soil degradation, reform respective policies and mobilise additional funding. A key aspect is the flexibility of the LDN process, which gives countries sufficient freedom to choose their targets, implementation paths and monitoring indicators according to their specific circumstances.

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Participative mapping is key to land degradation neutrality.

Photo: Klaus Ackermann

MEASURING LAND DEGRADATION NEEDS TO BE DONE FROM THE GROUND UP

Bush encroachment is a matter of growing concern in the semi-arid regions of Namibia. Locally adapted, long-term solutions for land restoration must be elaborated. It is crucial that local scientists are empowered to map and monitor the degradation process themselves, our authors maintain.

By John Yumbya Mutua and Ravic Nijbroek

The Herero people of Namibia are resilient. After migrating from the Great Lakes of East Africa as herdsmen, they faced invasion by armed migrants and survived bitter warfare throughout the 19th century. But today, in the remote, semi-arid Otjozondjupa Region, where they have their communal home, the Herero people face another threat – felt this time under their feet. The grassland their animals rely on is being replaced with dense, thorny bushes, a process called “bush encroachment”.

Commercial livestock farmers in the country face the same threat. The beef industry is a major economic sector in Namibia accounting for 68.4 million US dollars of the country’s export revenue annually. But bush encroachment is causing revenues to drop. This form of land degradation is now recognised as the fourth sub-national indicator in Namibia under the

UN Convention to Combat Desertification (UNCCD) process of Land Degradation Neutrality, which is setting a process in motion to map, restore and monitor degraded land on a global scale.

A FAST SPREADING PROBLEM

Our research shows rapid encroachment of high and low density bushes creeping into grassland areas (see Figure on page 37). This has important consequences for the land degradation process for a number of reasons. As an example, our preliminary findings show that significant amounts of carbon stored in the soil are lost after grasslands have been converted to bushland. It takes decades before bushes can sequester – or store – more carbon in the soil again. In addition, bush encroachment is

thirsty: the bushland roots reach much deeper into the soil than grasslands, sucking up valuable water resources, which in turn makes less water available for grasses and changes the local ecology.

While bushes are a natural feature of Otjozondjupa Region, it is not clear what is causing the rapid increase in bush density, and as yet, no cost-effective method has been identified to stop the encroachment. Some evidence suggests that livestock herding may itself be a driver, since bushes may be replacing grasses that have been overgrazed. Some entrepreneurs are trying to turn the problem into an opportunity by producing charcoal for the European market. What is certain is that local solutions for people like the Herero and other marginalised groups will need locally relevant solutions on the ground.

BUILDING CAPACITY ON THE GROUND

In 2016, we embarked on assessing the extent of land degradation in Otjondzupa Region in Namibia, and partnered with a team from the country's Ministry of Environment and Tourism (MET) – some of whom represent the government at the UNCCD – to establish a baseline to measure Soil Organic Carbon (SOC) and Bush Encroachment (BE). In order to develop the baselines to track encroachment, we first worked out baselines to track Land Use and Cover Change (LUCC) and Net Primary Productivity (NPP), which helps us distinguish bushes from grasses remotely. This was done by analysing different climatic, vegetative and topographic variables and data – which had not been carried out at such a scale and resolution before. Critically, all four of these variables are also the main indicators used by the government to report progress on Land Degradation Neutrality to the UNCCD.

While the CIAT team is based in Nairobi, Kenya, and our collaborators, World Soil Information (International Soil Reference and Information Centre – ISRIC) operating from Wageningen University in the Netherlands, we knew from the start that the success of land restoration efforts would depend on empowering local scientists to map and monitor the degradation and restoration processes

and, more importantly, that methodologies needed to be adapted locally. Namibia's model of Integrated Regional Land Use Planning (IRLUP) is based on stakeholder engagement with local communities. It is up to these communities to do the actual land restoration. If the activities involved are not accepted by the communities, they will likely fail. So it is important for them to be locally relevant and context-specific. Twenty land resources management professionals were trained in remote sensing, geographic information systems (GIS) and digital soil mapping (DSM) technologies using open source software; this enables participants to reproduce LDN baselines without additional software costs in the future.

THE NEXT STEPS

As part of a series of trainings, teams from different ministries and universities now lead the effort in collecting soil samples, identifying plant species, and digital soil mapping. We are now in the final stages of validating the LDN baseline results for a different region, Omusati. Enthusiasm for further collaboration is high, and applications of the newly acquired skills are limitless.

All regions are now required by law to complete IRLUP. As part of the process, important data, e.g. the land degradation baselines, are to

Namibia has established a national de-bushing programme which promotes the large-scale expansion of effective activities to fight bush encroachment. The programme is supported by public and private sector stakeholders. GIZ backs both this programme and IRLUP.

be included in participatory meetings with local communities such as the Herero. Yet the biggest achievement of our work may still be to come. Once communities like the Herero can use locally produced maps to co-develop sustainable approaches for managing bush encroachment, increasing soil carbon, water resources and improving livelihoods, we expect to see ground-breaking, locally relevant solutions.

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Land cover change in the study area

