United Nations Convention to Combat Desertification (UNCCD)
Proposal for an indicator for target 15.3

Provision of metadata including annex with country example (updated 07 September 2015)

Goal and target addressed

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.3: 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

Indicator 15.3.1: Trends in land degradation

Definition and method of computation

Definition

The indicator "Trends in land degradation" shows the trends in degrading, stable, or improving land at the global, regional and national level. These trends are determined in reference to a baseline defined by the current spatial extent of degrading, stable, and improving land.

The measurement unit of the indicator is the spatial area (ha, km^2) or proportion (%) of land that is degrading, stable, and improving per reference land unit (e.g., national, sub-national, land use/cover type). The minimum spatial reporting unit is 100 ha or 1 km^2.

Using a tiered approach, the derivation of the indicator "Trends in land degradation" is based on the synoptic utilization of trends in land use/cover (Tier 1), trends in land productivity (Tier 2a), and trends in soil organic carbon stocks (Tier 2b), all of which are available through numerous, widely-used global data sources.

Tier 1: Trends in land use/cover

Tier 2a: Trends in land productivity
Tier 2b: Trends in soil organic carbon stocks

Concept

The UNCCD defines land degradation as the "reduction or loss of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes arising from human activities" (UNCCD,1994).

Land degradation neutrality (LDN) is defined by the Intergovernmental Working Group (IWG) of the UNCCD as "a state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems" (IWG, 2015).

It is widely acknowledged that there is no single indicator which could unambiguously reflect the multiple pathways of land degradation which is driven by the complex human-ecosystem interactions involved with land use (Gibbs and Salmon, 2015). Since 2008, the Parties to UNCCD have been working on an indicator framework to measure progress towards the objectives of the Convention (UNCCD, 2013a).

At the 11th Conference of the Parties, an indicator framework composed of six indicators was adopted (UNCCD, 2013b), including the three indicators proposed here to derive the indicator "trends in land degradation". These indicators capture those biophysical dynamics which best characterize the complex process of land degradation given the availability of internationally-recognized data sources and methodologies.

Method of computation

The baseline (ten year average, 2000-2010) and subsequent trends in degrading, stable, or improving land are computed by the synoptic utilization of the following metrics:

- **Tier 1: Trends in Land Use/Cover.** This indicator is expressed in ha or km^2 or proportion of total land cover type and measure transitions from, *inter alia*, (1) natural and semi-natural land cover types (*e.g., forest, shrubs, grasslands, sparsely vegetated areas*) to agricultural land and artificial surfaces (*e.g., urban, infrastructure, recreation*), (2) agricultural land to artificial surfaces, and (3) agricultural land and artificial surfaces to natural and semi-natural land cover type.

- **Tier 2a: Trends in Land Productivity** (disaggregated by land use/cover type)**.** These trends are calculated from long-term time series of remotely-sensed data on net primary productivity (NPP) at 1 km^2 spatial resolution and at 10 day intervals. An overview on the state-of-the-art methodologies is given by Yengoh et. al., 2014; Cherlet et al. 2014; Quang Bao Le et al., 2014.

- **Tier 2b: Trends in Soil Organic Carbon (SOC) Stocks** (disaggregated by land use/cover type). Baseline data on SOC are derived from version 1.1 of the Harmonized World Soil Database (HWSD) (FAO/IIASA/ISRIC/ISS- CAS/JRC 2009) and are expressed in tons per ha to a depth of 1m at a nominal spatial resolution of 1km (Scharlemann et al. 2009). The FAO's Global Soil Partnership (GSP) is currently elaborating options for global measurements that would allow for the establishment of spatially distributed trends in SOC, estimated as a stock and expressed as mass (g C per ha) or content (% or g C/100 g of soil) for a reference depth.

Rationale and interpretation

The indicator "Trends in land degradation" emphasizes the pivotal role of NPP among a wider range of services provided by land. NPP is the basis of food production, regulates water, energy, and nutrient flows in land ecosystems, sequestrates carbon dioxide from the atmosphere and generally provides habitat for diverse species (MA, 2005; Safriel, 2007; Vogt et al., 2011). While the apparent loss of NPP is often associated with land degradation, it does not necessarily indicate land degradation (e.g., less intensive agriculture may decrease yields in the short-term, but improve environmental quality in the long-term), neither does an increase in NPP always indicate land improvement (e.g., overuse of fertilizers, shrub encroachment in natural grasslands).

In order to account for the variability of impacts from human-environment interactions, trends in land productivity are disaggregated by land use/cover type. Because changes in land use/cover often refer to ecosystem exploitation (Nachtergaele and Petri, 2008) and are conditioned by anthropogenic factors that define the social and ecological contexts for interpreting causalities from statistical results, broad land-use classes have been recommended for stratifying causal analyses and interpretations of land degradation (Vlek et al., 2010; Sommer et al., 2011; Vu et al., 2014).

While proxies for NPP, such as the Normalized Difference Vegetation Index (NDVI), only account for the quantity of standing biomass on the land, SOC is intrinsically connected to soil quality and organic content thus providing information on other ecosystem services, such as soil fertility maintenance and water flow regulation. SOC is one of the most important constituents of the soil due to its capacity to affect plant growth and is most informative when disaggregated by land use/cover.

The practical application of the indicator at national level is illustrated in the annex to this note, where an example of the outcomes of the LDN project is also documented.

Sources and data collection

Tier 1: Trends in Land Use/Cover

There are numerous global data sets and on-going initiatives that provide harmonized global land use and land cover change data. See:

IPCC, 2006 (Annex 3A.1) http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf_files/Chp3/Anx_3A_1_Data_Tables.pdf

European Space Agency's Climate Change Initiative Land Cover (CCI-LC) http://www.esa-landcover-cci.org/

FAO's Global Land Cover SHARE (GLC-SHARE) http://www.glcn.org/databases/lc_glcshare_en.jsp

For one example of a regional product, see:

Europe Corine Land Cover: http://www.eea.europa.eu/data-and-maps/data/corine-land-cover

Tier 2a: Trends in Land Productivity

The main sources for determining land productivity are remote sensing data sets comprised of NDVI and other vegetation indices/variables. These are derived from different platforms and sensors covering time series from 1982 to the present, taken at weekly to monthly intervals and at spatial sampling sizes between 250 m and 8 km pixels. There are several on-going initiatives to analyze these time series in order to derive trends in land productivity (Yengoh et. al., 2014). For data sources and methodologies, see:

NASA http://gcmd.gsfc.nasa.gov/index.html

ESA http://land.copernicus.eu/global/themes/Vegetation

JRC http://wad.jrc.ec.europa.eu/

Tier 2b: Trends in Soil Organic Carbon (SOC) Stocks

Global estimates of SOC stocks have been produced in the past to support the calculation of soil carbon fluxes under scenarios of land use/cover change and climatic conditions (IPCC, 2006), but very few global estimates are presented as spatial data. For global spatial layers on soil parameters, the most recent and complete data set is contained in the Harmonized World Soil Database (HWSD). See: http://eusoils.jrc.ec.europa.eu/ESDB_Archive/octop/Global.html).

Available spatial data sets are model-derived and do not currently provide trends. However, global information on land use/cover change could be used to derive coarse estimates of trends in SOC stocks using the IPCC methodology (IPCC, 2006). At regional levels (e.g., Africa, Australia, Europe), initiatives exist that aim to establish methodologies and protocols for regional scale SOC measurement. These initiatives could produce regular up-dates of spatially disaggregated SOC data for wide areas, especially of agricultural land (Aynekulu et al., 2011; Lugato et al., 2014). See also: http://www.worldagroforestry.org/downloads/Publications/PDFS/TM11192.pdf

http://eusoils.jrc.ec.europa.eu/library/Themes/SOC/LUCASSOC/

Disaggregation

In addition to land use/cover, the indicator “Trends in land degradation” could be further spatially disaggregated to sub-national administrative and management-relevant landscape units, such as watersheds or bio-cultural regions.

Comments and limitations

While there is no single indicator which could unambiguously track “Trends in land degradation”, global monitoring efforts are possible by considering a few metrics in combination, given that they are measurable, compatible and faithful in capturing trends that are globally comparable. The metrics proposed here meet these criteria and have already been adopted by the UNCCD Conference of the Parties and will be used by the Parties to set nationally voluntary LDN targets and report on progress towards achieving these targets.

Since national and sub-national data is not systematically collected on a routine, harmonized and comparable basis, particularly in low-income countries, the monitoring of “Trends in land degradation” will rely on remote sensing global data sets for the foreseeable future. The use of these data sets will ensure harmonization and comparability. It will limit the burden of data collection efforts and put a greater emphasis on data quality improvement and interpretation. When possible, countries should validate default global data with national data with the aim of integrating top-down and bottom-up approaches.

It is important to recognize that this indicator does not comprehensively address all quantitative and qualitative aspects of land degradation. Thus, complementary indicators at national and sub-national scales could assist in monitoring issues relevant to specific national contexts within broader monitoring and evaluation frameworks. Indicators reported under other SDG targets (e.g., metrics on socio-economic and governance variables) could also contribute to the enhancement of the indicator “trends in land degradation”.

The use of remotely sensed long-term time series for deriving trends in land productivity has repeatedly raised concerns of comparability due to the apparently diverging results of various products. Issues to be clarified here relate to agreement on the length of reference time series, the method of aggregating and interpreting observed vegetation indices to derive annual productivity proxies, and approaches to evaluate time series from different sensors. Following recent workshops organized by GEF STAP in 2014 and 2015, an agreement between relevant organizations, including NASA, ESA and the EC Joint Research Centre, has been reached to jointly address these issues.

At the current time, this indicator is unsuited to annual derivation due to the 5 year sampling interval for trends in land use/cover. However, projections or extrapolations could be applied for annual reporting if required.

Gender equality issues

The indicator “Trends in land degradation” is not suitable for disaggregation by gender.

Data for global and regional monitoring

The United Nations Convention to Combat Desertification (UNCCD) compiles data for this indicator “trends in land degradation” with the assistance of its international partner organizations. With decision 22/COP.11 of the Conference of the Parties (COP) to the UNCCD, the Convention has established a monitoring and evaluation approach for land degradation consisting of: (i) a set of six progress indicators (including land use/cover, land productivity and soil organic carbon); (ii) a conceptual framework that allows the integration of indicators; and (iii) indicators sourcing and management mechanisms.

This monitoring and evaluation approach will be used by UNCCD country Parties to set voluntary LDN targets and report on progress towards achieving these targets. The UNCCD secretariat is requested to provide countries with national estimates for each indicator based on globally available data sources. Country Parties, in turn, are invited to validate these national estimates when implementing the LDN target and in the context of their National Action Programmes (NAPs). Furthermore, progress towards achieving LDN targets will be assessed by the governing bodies of the Convention, in particular the Committee for the Review of Implementation of the Convention (CRIC), against data and information contained in national reports. The CRIC reviews information on progress indicators every four years.

The UNCCD secretariat started testing this approach since May 2014 within the LDN Project currently being implemented by 16 country Parties worldwide (see Annex 1). Data and information on the progress indicators are being compiled in cooperation with the JRC and the indicators tested against their relevance, methodological soundness, measurability and ease of understanding and communication.

Supplementary information

FAO, IFAD and UNEP have proposed mutually supportive and relevant indicators, namely "Percentage of agricultural area under sustainable agricultural practices" for target 2.4, and "Forest cover under sustainable forest management" for target 15.2. We note that both of these indicators complement and enrich the suggested indicator for target 15.3, namely “Trends in land degradation”, both at the first and second tier level as proposed and will help to provide a more comprehensive monitoring and evaluation framework for these targets (using current technology and data and that makes use of advances in technology and data in coming years).

During the next months, coordination among UNCCD, FAO, UNEP, and the other agencies involved such as EC will be put in place, in collaboration with voluntary pilot countries, in order to formulate/develop the most appropriate metrics and interpretation guidance for the proposed indicators. Furthermore, the suggested indicator “Trends in land degradation” is compatible with the System of Environmental-Economic Accounting/ Experimental Ecosystem Accounting (SEEA EEA) which can provide the statistical framework for measuring land degradation as being developed by the UNSD.

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Annex 1

Country example for operationalizing the indicator "Trends in land degradation"

1. Introduction

The UNCCD secretariat is currently facilitating the Land Degradation Neutrality (LDN) project which is being implemented by 16 country Parties worldwide.[1] The objective of this pilot project is to assist participating countries in translating the LDN target into national voluntary targets and testing the indicator "Trends in land degradation" being proposed for the SDG global indicator framework.

Data for this indicator have been compiled in cooperation with the European Commission's Joint Research Center (JRC) and provided to all participating countries for validation in numerical, vector and raster formats; however the data included in this Annex has not yet been validated at country level. While other datasets could be equally applicable in deriving this indicator, the following country examples utilize the data sets which are currently being used in the context of the LDN project, including the following land use/cover categories. These categories have been selected because they are implementable, complete (in that all land areas in a country may be classified by these categories without duplication) and aligned with the 6 land use categories recommended by IPCC for the purpose of estimating anthropogenic emissions and removals from land use, land-use change and forestry (IPCC, 2006).

Table 1: Land categories

Value	Categories	Short description	ESA CCI-LC classes (codes)
1	**Forests**	Geographical areas dominated by **natural tree plants** with a cover of 15% or more. This class also includes: - mosaic tree and shrub (>50%) / herbaceous cover - seasonally or permanently flooded with fresh water	Tree broadleaved evergreen, Tree broadleaved deciduous, Tree needle leaved evergreen, Tree needle leaved deciduous, Tree mixed leaf type, Mosaic tree, shrub / HC, Tree flooded, fresh water (50, 60, 61, 62, 70, 71, 72, 80, 81, 82, 90, 100, 160)
2	**Shrubs, grasslands and sparsely vegetated areas**	Geographical areas dominated by: **natural shrubs**; or **natural herbaceous plants**; or s**parse natural vegetation** with a cover of 15% or less; This class also include: - mosaic natural vegetation (>50%) / crops - mosaic herbaceous cover (>50%) / tree and shrub	Mosaic vegetation / cropland, Mosaic HC / tree, shrub, Scrublands, Grassland, Lichens and mosses, Sparse vegetation (40,110, 120, 121, 122, 130, 140, 150, 152, 153)
3	**Cropland**	Geographical areas dominated by: **herbaceous crops**; or **woody crops**; or **mixed herbaceous and woody crops**; This class also include: - mosaic crops (50%) / natural vegetation	Cropland rain fed, Cropland irrigated / post-flooding, Mosaic cropland / vegetation (10, 11, 12, 20, 30)
4	**Wetlands and water bodies**	Geographical areas dominated by: **shrub or herbaceous vegetation, aquatic or regularly flooded**; or **mangroves** or **water bodies**	Tree flooded, saline water, Shrub or herbaceous flooded, Water bodies (170,180,210)
5	**Artificial areas**	Geographical areas dominated by **artificial surfaces**, including urban and associated areas (e.g. urban parks), transport infrastructures, industrial areas, burnt areas, waste deposits, extraction sites.	Urban areas (190)
6	**Bare land and other areas**	Geographical areas dominated by: **bare areas** or **snow and glaciers**	Bare areas, Permanent snow and ice (200, 201, 202, 220)

[1] Algeria, Armenia, Belarus, Bhutan, Chad, Chile, Costa Rica, Ethiopia, Grenada, Indonesia, Italy, Myanmar, Namibia, Panama, Senegal and Turkey

For the LDN project, the ESA's Climate Change Initiative Land Cover dataset (CCI-LC) has been used as default source of land cover data, for which three epochs are available: 2000, 2005 and 2010. The 2000 and 2010 epochs were used to analyze land use changes, focusing on the six broad land categories listed above.

The JRC's Land Productivity Dynamics (LPD) dataset has been used as default option for the LDN project. The LPD data set has been derived from a 15-year time series (1998 to 2012) of global NDVI observations composited in 10-day intervals at a spatial resolution of 1 km. The data set includes 5 classes of land productivity trends over the above-mentioned time period, which provides a qualitative combined measure of the intensity and persistence of negative or positive changes in over the observed period.

Table 2: Classes of productivity

Value	Description
1	Declining productivity
2	Early signs of decline
3	Stable, but stressed
4	Stable, not stressed
5	Increasing productivity

In addition the spatial extend and distribution of the LPD classes have been disaggregated by the 6 LUC classes described before and have been made available for each country as numerical values of the area (ha or sq km) of LPD class under the respective Land Cover classes mapped by the ESA data in 2000 and 2010, as well as in relation to areas which have been subject to land cover change.

For the Soil Organic Carbon (SOC), the amended Harmonized World Soil Database (HWSD) has been used as default data, in order to take into account the differences in soils while estimating the overall SOC stock, for the different land cover classes. The value of SOC provided in the data set is a continuous variable ranging from 0 (bare soil in arid zones) to 1050 tons (wetlands/peatlands in highlands and cold climate) per hectare.

Numerical estimates of all metrics have been compiled by the LDN Project, and provided to the pilot countries in excel tables to facilitate the identification of critical processes and setting tentative LDN targets, along a four-step approach:

Step 1: identifying negative trends	**Identify, map and quantify the negative trends indicating signs and risks of land degradation.**
Step 2: identifying land management options	Identify land management options that can stop or reverse the identified negative trends and therefore lead to the expected LDN situation in a voluntary assumed time frame as an integral part of the NAP. The management options proposed by the IWG are: (a) prevent, avoid or minimize land degradation; and (b) rehabilitate or restore degraded land.
Step 3: reviewing the national action programme	Review, when it exists, the national action programme to ascertain if it encompasses the necessary legal, financial, scientific and administrative frameworks and land management options to efficiently and timely stop or reverse the identified negative trends.
Step 4: setting LDN national voluntary targets	Set targets for achieving land degradation neutrality (expressed in relation to measureable indicators) in terms of time and resources needed for the implementation of the identified management and policy options.

LUCs have been considered especially for identifying critical transitions from semi-natural land cover classes (Forest, shrubs, grasslands and sparsely vegetated areas) to cropland and to artificial surfaces, from cropland to artificial surfaces, as well as from cropland to semi-natural land cover types. LPD data helped in

locating the areas that show signs of land productivity decline and stress, as they can be interpreted as advanced or early signs of land degradation (paying particular attention in all land cover classes to the areas classified with the codes 1 to 3).

This methodology is being applied to all LDN pilot counties. As an example, the preliminary outcomes for Namibia are reported in the following section.

2. Country example: Namibia

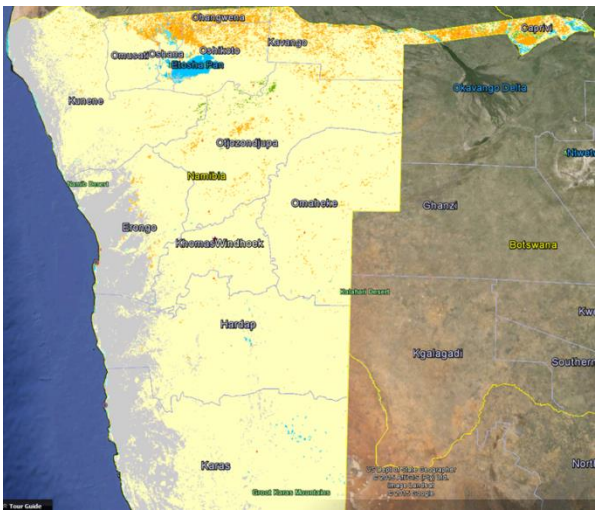
Presentation of national basic data using the LDN indicators framework

Land-Use Category	Land area (2000)	Land area (2010)	Net change in area (2000-2010)	Net land productivity change (sq km, 2000-2010)					Soil organic carbon (2010)
	sq km	sq km	sq km	Declining	Early stage of declining	Stable but stressed	Stable not stressed	Increasing	ton/ha
Forest land	1.575,20	1.561.40	-13,80	61,10	353,20	21,20	1.072,00	53,90	17,40
Shrubs, grasslands and sparsely vegetated areas	665.162,10	665.167.50	5,40	40.995,30	103.964,70	3190,60	480.142,10	18.857,60	13.92
Cropland	40.199,50	40.207.90	8,40	434,00	1.421,60	91,40	32.829,40	5.391,50	13.81
Wetlands and water bodies	7.242,70	7.242.70	0,00	481,80	69,30	182,90	5.459,30	243,20	15,99
Artificial areas	443,00	443.00	0,00	47,50	26,60	0,00	324,80	6,40	12,49
Bare land and other areas	113.141,90	113.141.90	0,00	2.796,80	2.376,30	229,20	26.788,30	9,10	10,00
Balancing term	0,00	0,00	0,00						
Total	**827.764,40**	**827.764,40**	**0,00**						

Tier 1: Trends in land cover/use
Information source: ESA CCI Land Cover data 2000 and 2010, spatial resolution 300 m (http://www.esa-landcover-cci.org/)

80.35% of Namibia's land surface is covered by shrub and grass savannah which is subject to significant degradation due to overgrazing and/or shrub encroachment. Only 4.86% of Namibia's land surface is used as cropland and 0.19% is forested. Crop and forest lands are primarily concentrated in in the northeastern parts of the country. Namibia has only ephemeral surface water and seasonal wetlands (e.g., Etosha pan) which account for 0.87% of the land surface. The western and southern desert areas of the Namib and Kalahari cover 13.67%. According to ESA CCI Land Cover, there has been hardly any land cover change between the 6 classes from 2000 and 2010, with only a loss of 13.80 km^2 of forest reported.

Value	Description
1	Forests
2	Shrubs, grasslands and sparsely vegetated areas
3	Cropland
4	Wetlands and water bodies
5	Artificial areas
6	Bare land and other areas

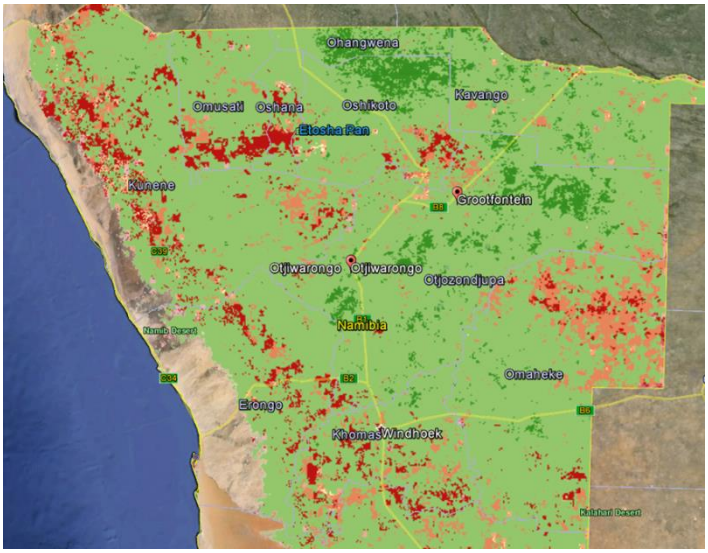


Tier 2a: Trends in land productivity

Information source: land productivity dynamics derived from SPOT VEGETATION (VGT) time series 1998 to 2013, spatial resolution 1 km (Cherlet et. al. 2014, Cherlet et. al.2013)
http://wad.jrc.ec.europa.eu/data/EPreports/LPDinEU_final_no-numbers.pdf

The 5 classes show trends in land productivity over 15 years derived from VGT NDVI (1998 to 2013). 66.03% of Namibia's land surface shows stable land productivity (values 3 and 4) over the period while 2.97% exhibits increasing productivity (value 5). 18.93% of Namibia's land surface shows signs of declining land productivity (values 1 and 2). The remaining 12.07% are desert areas where the productivity level remains below detectable limits. The spatial distribution of areas showing increasing and decreasing trends in land productivity reflect to some extent the aridity gradient with increasing aridity from the northeast to the west and southwest. The disaggregation of trends in land productivity by land use/cover reveals a more differentiated picture. 27.65% of forest land shows declining productivity while only 3.44% shows signs of increased productivity. As rangeland use is the major source of rural income and livelihood, 22.27% of shrub and grasslands show signs of decreasing productivity and represents 94.53% of all declining areas. In turn, only 4.83% of the croplands show signs of declining productivity while increasing productivity trends are observed on 13.41% of the croplands.

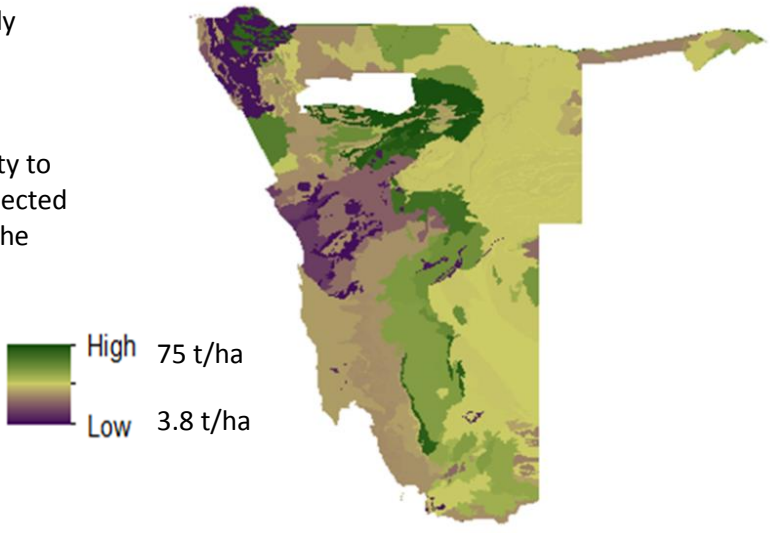
Value	Description
1	Declining productivity
2	Early signs of decline
3	Stable, but stressed
4	Stable, not stressed
5	Increasing productivity



Tier 2b: Trends in soil organic carbon (SOC)

Information source: Datasets derived from Harmonized World Soil Database, spatial resolution 1 km (FAO/IIASA/ISRIC/ISS-CAS/JRC, 2009) http://eusoils.jrc.ec.europa.eu/ESDB_Archive/octop/Global.html

Currently no global information on spatially distributed SOC trends at country level is available; nevertheless the existing global datasets can be used in the definition of a common baseline of the soil/land's capacity to provide carbon sequestration which is expected to become more regularly up-dated with the expected increasing amount of SOC data collection.



Namibia: tentative LDN target setting

Negative trends	Area (sq km)	Corrective measures	LDN target		Investments required (M USD)
			Area (sq km)	Time (year)	
Conversion of forests into shrubs, grasslands and sparsely vegetated areas (12) with declining productivity (1)	5,3	Reforestation with local species	-5,3	2030	4.8
Conversion of forests into cropland (13) with early signs of declining productivity (2) or stable and not stressed (4)	8,5	Reforestation with local species	-8,5	2040	7.7
Forest (11) showing early signs of decline (2) and having a declining productivity (1)	414,30	Avoiding further decline of forest though economic incentives (Rehabilitation)	-414,30	2030	124
Shrubs, grasslands and sparsely vegetation (22) showing early signs of decline (2)	104.013,50	SLM practices to avoid overgrazing	-104.013,00	2040	728
		SLM practices to avoid soil erosion			
		Consider enforcing compensation			
Cropland (33) showing declining productivity (1) and early signs of decline (2)	14.849,00	Use agroforestry practices to improve cropland productivity	-14.849,00	2035	1,039
Shrubs, grasslands and sparsely vegetation (22) increasing productivity (5)*	18.880,20	Introduce financial viable alternative options for the prevention of bush encroachment	-18,880,20	2040	47
				TOTAL	1939.2

- Reforest and increase the productivity of 13.8 km2 (1380 ha) forests that has been converted into croplands or shrubs, grasslands and sparse vegetation by 2040
- Improve the productivity of the 414,3 km2 (41 430 ha) forest area currently showing early signs of decline and having declining productivity by 2030
- Improve the productivity of 104 013 km2 (10,4 M ha) of shrubs, grasslands and sparsely vegetated areas currently showing signs of declining productivity by 2040
- Improve the productivity of 14 849 km2 (1.5 M ha) of cropland currently showing signs of declining productivity by 2035
- Reduce the bush encroachment on 18 880 km2 (1,9 M ha) area showing signs of increasing bush encroachment by 2040
- Maintain the current soil organic carbon levels beyond 2040: Forests at 17 t/ha; Shrubs, grasslands, sparsely vegetated land, Cropland at 14 t/ha; Wetlands at 16 t/ha