# LDN monitoring in support of UNCCD & SDG

LDN INDICATOR FRAMEWORK & CASE STUDY ON COLLECT EARTH

# The UNCCD 2018-2030 Strategic Framework

**Vision**

To avoid, minimize, and reverse desertification/land degradation and mitigate the effects of drought … and strive to achieve a land degradation-neutral world consistent with the 2030 Agenda for Sustainable Development

**SO1**

- **To improve the condition of affected ecosystems**, combat desertification/land degradation, promote sustainable land management and **contribute to land degradation neutrality**

**SO2**

- To improve the **living conditions** of affected populations

**SO3**

- To mitigate, adapt to, and manage the **effects of drought** in order to enhance resilience of vulnerable populations and ecosystems

**SO4**

- To generate **global environmental benefits** through effective implementation of the UNCCD

**SO5**

- To mobilize substantial and additional financial and non-financial **resources** to support the implementation of the Convention by building effective partnerships at global and national level

# The UNCCD 2018-2030 Strategic Framework: Common Global Indicators

**SO1**
- SO1-1:Trends in land cover
- SO1-2:Trends in land productivity
- SO1-3:Trends in carbon stocks above and below ground
- SDG indicator 15.3.1: Proportion of land that is degraded over total land area

**SO2**
- SO2-1:Trends in population living below the relative poverty line and/or income inequality in affected areas
- SO2-2:Trends in access to safe drinking water in affected areas

**SO3**
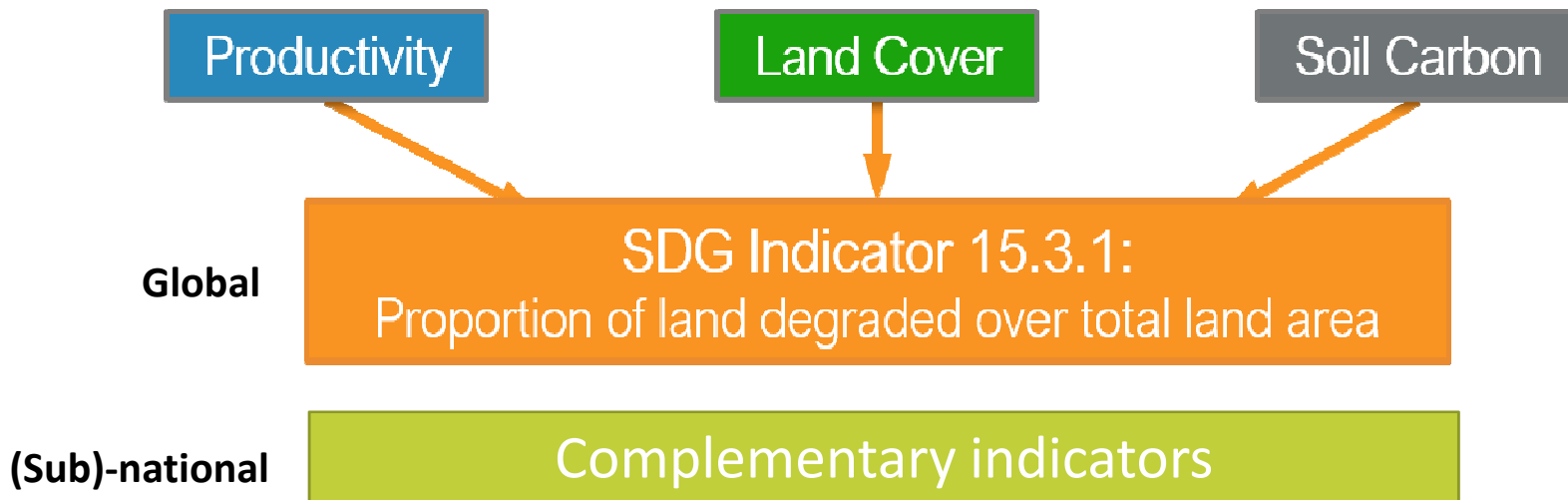- Drought indicators in use at the national level

**SO4**
- Red list Index

**SO5**
- SO5-1: Trends in international bilateral and multilateral Official Development Assistance
- SO5-2: Trends in domestic public resources
- SO5-3: Trends in the number of co-financing partners
- SO5-4: Resources mobilized from innovative sources of finance, including from the private sector

LDN related monitoring: "Multi-purpose" land based indicators supporting UNCCD _and_ SDG reporting

**Productivity**     **Land Cover**     **Soil Carbon**

**Global**

SDG Indicator 15.3.1:
Proportion of land degraded over total land area
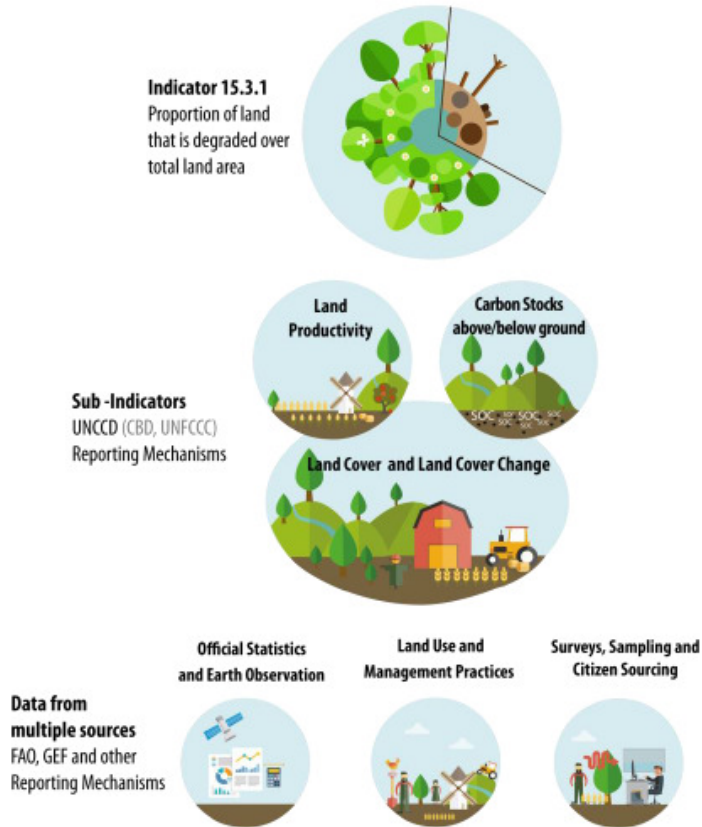
**(Sub)-national**

Complementary indicators

**UNCCD Secretariat: Custodian agency for SDG indicator 15.3.1**

2. UNCCD reporting = SDG reporting for indicator 15.3.1

# LDN M&E: a tiered approach

## Framework for Monitoring and Reporting on SDG Target 15.3



**Indicator 15.3.1** Proportion of land that is degraded over total land area

**Sub-Indicators** UNCCD (CBD, UNFCCC) Reporting Mechanisms

Land Productivity

Carbon Stocks above/below ground

Land Cover and Land Cover Change

Official Statistics and Earth Observation

Land Use and Management Practices

Surveys, Sampling and Citizen Sourcing

**Data from multiple sources** FAO, GEF and other Reporting Mechanisms

**The computation of the 3 sub-indicators may be classified via a tiered approach:**

**Tier 1 (default method):** Global/regional earth observation, geospatial information and modelling;
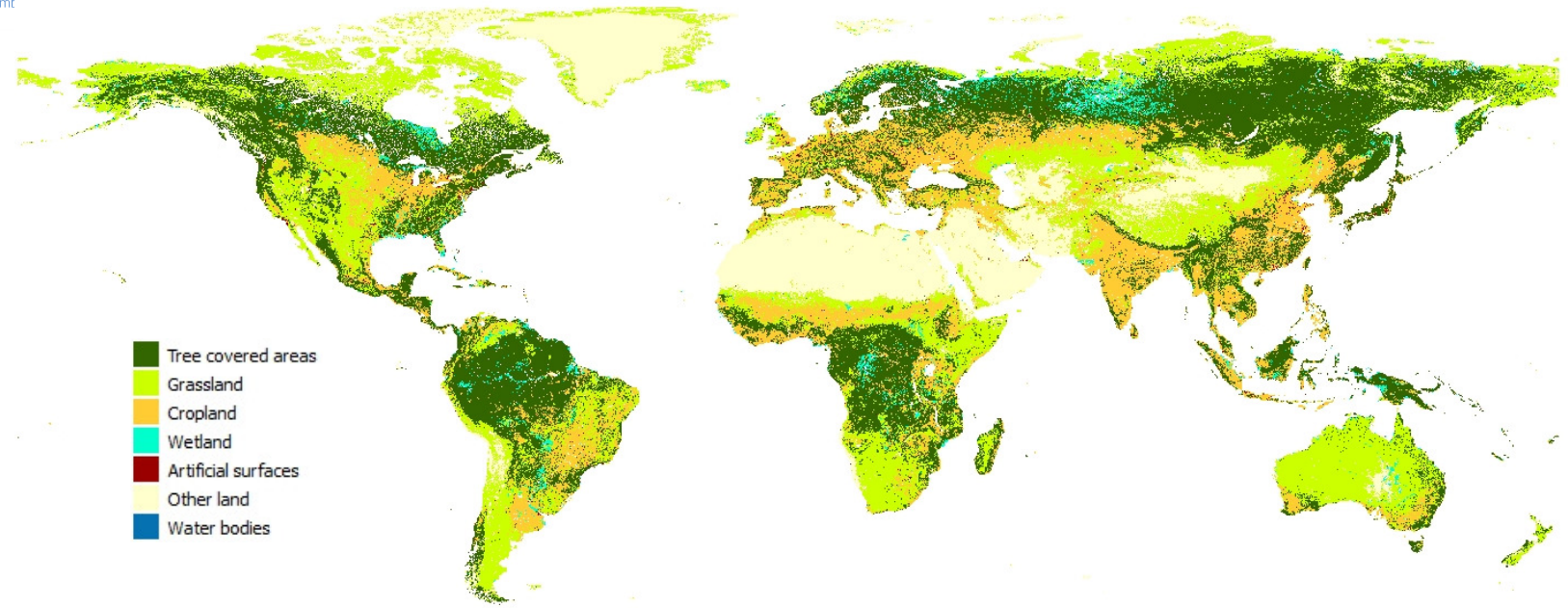
**Tier 2:** National statistics based on data acquired for administrative or natural reference units (e.g. watersheds) and national earth observation;

**Tier 3 (most detailed method):** Field surveys, assessments and ground measurements.

**This approach enables national authorities to use methods consistent with their capacities, resources and data availability**

**3. Countries can use global default data sources or national data for LDN reporting depending on national capacities.**

# Land Cover



**Legend:**
- Tree covered areas
- Grassland
- Cropland
- Wetland
- Artificial surfaces
- Other land
- Water bodies

| Sub-indicator | Default data source | Observation |
|---|---|---|
| **SO1-1: Trends in Land Cover (Change)** | ESA CCI-LC 300m annual global LC time series from 1992–2015, ver. 2.0.7 (36 classes) | • Observes physical and biological cover of the Earth's surface.<br>• Detects loss of biomass or a reduction in vegetative cover and soil nutrients, capacity to provide human livelihoods, loss of biodiversity…<br>• Used to disaggregate the other two indicators |

**S01-1** Trends in land cover

**Land cover**

**Quantitative data** National level estimates of the distribution of the main land cover classes (in kilometres squared (km²)).
Default data are derived from the **Default data 2000-2015**
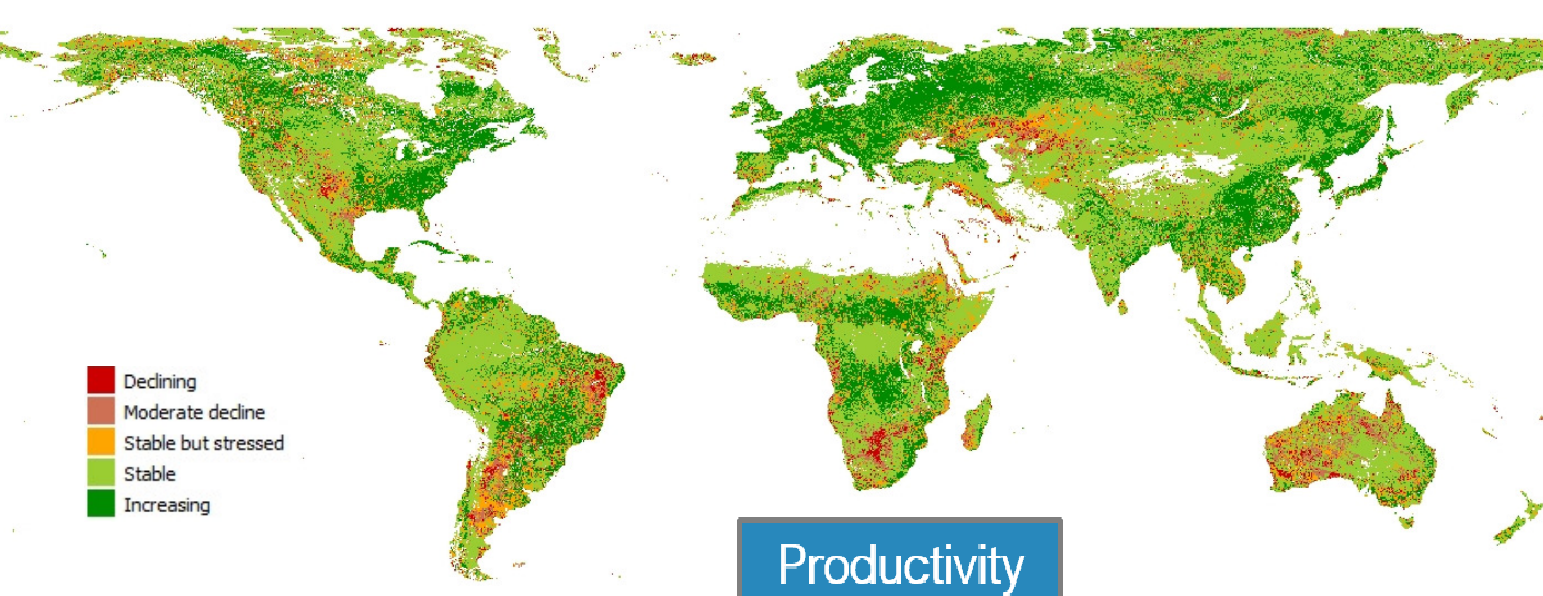and they can be amended as appropriate.

| Year | Tree-covered areas | Grassland | Cropland | Wetland | Artificial surfaces | Other Land |
|------|------|------|------|------|------|------|
| 2000 | 182.484 | 118.239 | 443.870 | 2.064 | 4.731 | 16.101 |
| 2001 | 182.468 | 118.513 | 443.445 | 2.067 | 4.920 | 16.102 |
| 2002 | 182.909 | 118.551 | 442.815 | 2.077 | 5.084 | 16.072 |
| 2003 | 183.435 | 118.601 | 442.104 | 2.078 | 5.216 | 16.040 |
| 2004 | 184.455 | 118.317 | 441.293 | 2.081 | 5.317 | 15.989 |
| 2005 | 185.103 | 117.927 | 440.943 | 2.084 | 5.523 | 15.883 |
| 2006 | 185.711 | 117.555 | 440.642 | 2.088 | 5.688 | 15.805 |
| 2007 | 186.587 | 117.400 | 439.843 | 2.089 | 5.861 | 15.717 |
| 2008 | 189.240 | 116.610 | 437.944 | 2.094 | 6.013 | 15.615 |
| 2009 | 190.603 | 116.094 | 437.042 | 2.092 | 6.184 | 15.402 |
| 2010 | 190.960 | 115.895 | 436.767 | 2.092 | 6.340 | 15.287 |
| 2011 | 191.238 | 115.718 | 436.560 | 2.088 | 6.521 | 15.183 |
| 2012 | 191.197 | 115.482 | 436.668 | 2.087 | 6.733 | 15.062 |
| 2013 | 191.282 | 115.429 | 436.410 | 2.084 | 7.056 | 14.959 |
| 2014 | 191.934 | 115.351 | 435.492 | 2.079 | 7.466 | 14.840 |
| 2015 | 191.877 | 115.336 | 435.344 | 2.078 | 7.728 | 14.800 |
| Net area change | 9.393 | -2.903 | -8.526 | 14 | 2.997 | -1.301 |

Land cover area change matrix (in squared kilometers).

| Initial class \ Final class | Tree-covered areas | Grassland | Cropland | Wetland | Artificial surfaces | Other land |
|------|------|------|------|------|------|------|
| Tree-covered areas | 179.075 | 395 | 2.272 | 10 | 611 | 74 |
| Grassland | 1.361 | 113.971 | 2.664 | 0 | 115 | 47 |
| Cropland | 11.277 | 856 | 430.041 | 0 | 1.274 | 152 |
| Wetland | 12 | 0 | 0 | 2.041 | 7 | 0 |
| Artificial surfaces | 0 | 0 | 0 | 0 | 4.731 | 0 |
| Other land | 120 | 69 | 282 | 0 | 973 | 14.505 |

National UNCCD report 2018/19
Performance Review and Assessment of
Implementation System (PRAIS)
Example Turkey

https://prais.unccd.int/unccd/reports

Productivity

| Sub-indicator | Default data source | Observation |
|---|---|---|
| **SO1-2: Trends in land productivity or functioning of the land (land productivity dynamics, LPD)** | Joint Research Centre (JRC) LPD datasets at 1km resolution<br>Global 15-year (1999 to 2013) time series of daily SPOTVGT normalized difference vegetation index(NDVI)images aggregated/composited for observation every 10 days (i.e. 540 observations overall for each pixel) | • Estimates the overall above-ground vegetation biomass productivity resulting from all land components and their interactions<br>• Indicates long-term changes in the health and productive capacity of the land<br>• Reflects the effects of changes in ecosystem functions for plant and biomass growth |

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**SO1-2**    Évolution de la productivité ou du fonctionnement des terres

**Dynamique de la productivité des terres**
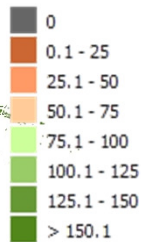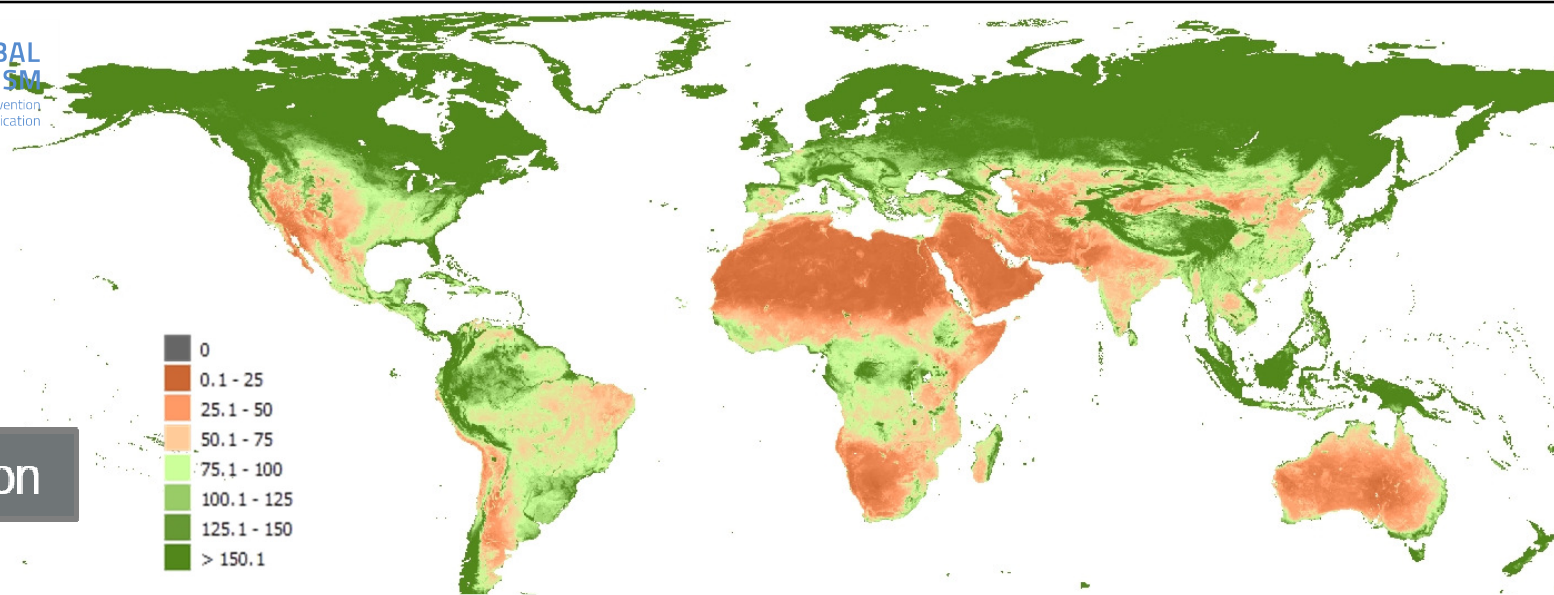
Données quantitatives

Estimations nationales de la variation nette de la productivité des terres dans chaque type de couvert terrestre : zone couverte par chaque type de variation nette de la productivité des terres (en km²).

Les données par défaut sont extraites de   Land Degradation Neutrality Target Setting Programme

et peuvent être modifiées, le cas échéant.

| Type de couvert terrestre | Variation nette de la productivité des terres (de 2000 à 2015) (en km2) | | | | | |
|---|---|---|---|---|---|---|
| | Déclin de la productivité | Déclin modéré | Soutenue | Stable | Accroissement de la productivité | Pas de données |
| Zones boisées | 806,93 | 680,33 | 1.273,6 | 8.732,28 | 5.854,3 | 54,09 |
| Pâturages | 1.964,69 | 817,08 | 1.358,41 | 71.663,96 | 10.473,34 | 5.762,13 |
| Terres cultivées | 1.131,4 | 1.387,85 | 1.330,68 | 57.682,43 | 29.462,4 | 2.260,33 |
| Zones humides | 0,25 | 0 | 0,8 | 2,86 | 1,2 | 13,77 |
| Surfaces artificielles | 82,14 | 22,57 | 158,13 | 884,12 | 101,53 | 160,07 |
| Autres terres | 2.444,85 | 377,92 | 1.880,03 | 31.743 | 251,49 | 2.039.457,18 |

Estimations de la dynamique de la productivité des terres en cas de conversion d'un type de couvert terrestre en un autre type de couvert terrestre (en km²)

| Conversion des terres | | Évolution nette de la superficie (en km²) | Net land productivity dynamics (2000-2013) (km2) | | | | |
|---|---|---|---|---|---|---|---|
| De | En | | Declining | Moderate decline | Stressed | Stable | Increasing |
| Zones boisée | Terres cultivé | 38,96 | 2,55 | 2,96 | 2,56 | 14,47 | 16,34 |
| Zones boisée | Pâturages | 52,39 | 0,85 | 4,2 | 3,18 | 29,52 | 14,64 |
| Pâturages | Surfaces artif | 158,58 | 11,15 | 2,72 | 18,26 | 91,04 | 31,49 |
| | | | | | | | |
| Ajouter une ligne | | | | | | | |

National UNCCD report 2018/19
Performance Review and Assessment of Implementation System (PRAIS)
Example Algeria

https://prais.unccd.int/unccd/reports

Soil Carbon

Legend:
- 0
- 0.1 - 25
- 25.1 - 50
- 50.1 - 75
- 75.1 - 100
- 100.1 - 125
- 125.1 - 150
- > 150.1

| Sub-indicator | Default data source | Observation |
|---|---|---|
| **SO1-3: Trends in carbon stocks above and below ground (soil organic carbon (SOC) stock)** | ISRIC SoilGrids 250m global soil mapping products (SOC percentage, bulk density, gravel content) | Fundamental part of the terrestrial ecosystem used as a proxy for ecosystem and soil health<br>To derive trends in SOC, two types of information are required:<br>• Baseline SOC stocks (e.g. ton/ha) for the country in the year of interest (here 2000);<br>• Some way of relating changing landuse/LC conditions to changes in SOC stocks. |

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United Nations Convention to Combat Desertification

National UNCCD report
2018/19
Performance Review and
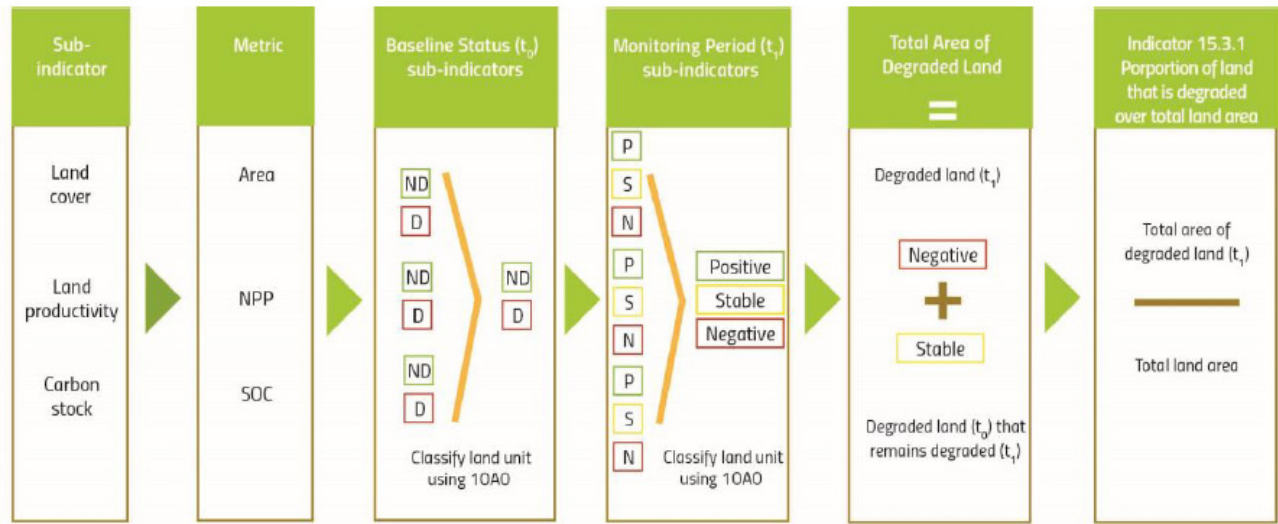Assessment of
Implementation System
(PRAIS)
Example Egypt

https://prais.unccd.int/unccd/reports

**SO1-3** — Trends in carbon stocks above and below ground

Soil organic carbon stocks

Quantitative data — National level estimates of the soil organic carbon (SOC) stock in topsoil (0-30 cm) within each land cover type (in tonnes per hectare).

Default data are derived from the Land Degradation Neutrality Target Setting Programme and they can be amended as appropriate.

SO1-3-QD

| Year | Soil organic carbon stock in topsoil (t/ha) | | | | | |
|------|------------------|-----------|----------|---------|--------------------|------------|
| | Tree-covered areas | Grassland | Cropland | Wetland | Artificial surfaces | Other Land |
| 2000 | 49,58 | 6,85 | 56,49 | 14,55 | 44,74 | 5,92 |
| 2001 | 49,58 | 6,85 | 56,49 | 14,55 | 44,74 | 5,92 |
| 2002 | 49,4 | 6,84 | 56,49 | 14,55 | 44,71 | 5,92 |
| 2003 | 49,24 | 6,83 | 56,48 | 14,55 | 44,67 | 5,92 |
| 2004 | 49,1 | 6,82 | 56,47 | 14,55 | 44,63 | 5,92 |
| 2005 | 48,44 | 6,81 | 56,46 | 14,55 | 44,57 | 5,93 |
| 2006 | 47,92 | 6,79 | 56,44 | 14,55 | 44,5 | 5,93 |
| 2007 | 47,64 | 6,77 | 56,42 | 14,54 | 44,42 | 5,93 |
| 2008 | 47,04 | 6,75 | 56,39 | 14,54 | 44,34 | 5,93 |
| 2009 | 46,75 | 6,73 | 56,37 | 14,54 | 44,25 | 5,93 |
| 2010 | 46,2 | 6,71 | 56,34 | 14,53 | 44,15 | 5,93 |
| 2011 | 45,71 | 6,69 | 56,31 | 14,53 | 44,05 | 5,94 |
| 2012 | 45,13 | 6,67 | 56,27 | 14,53 | 43,95 | 5,94 |
| 2013 | 44,7 | 6,65 | 56,23 | 14,52 | 43,83 | 5,94 |
| 2014 | 44,1 | 6,63 | 56,19 | 14,52 | 43,7 | 5,94 |
| 2015 | 43,64 | 6,6 | 59,14 | 14,51 | 43,58 | 5,95 |

Estimates of change of organic carbon stock in soil due to land conversion to a new land cover type

# How to define land degradation?

**4. One-out, all-out (1OAO)**

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**Mediterranean Forest Week**

❑ One of the three indicators indicates a significant negative change

➔ **Change is considered a loss**

❑ At least one indicator shows a significant positive change and none showed a significant negative change

➔ **The change is considered a gain**

# How to define land degradation?

## 4. One-out, all-out (1OAO)



National UNCCD report
2018/19
Performance Review and
Assessment of
Implementation System
(PRAIS)
Example Tunisia

https://prais.unccd.int/unccd/reports

# Status of land degradation

| Country | Total area degraded (km2 1000s) | % degraded land | Confidence |
|---------|----------------------------------|------------------|------------|
| Algeria | 18.5 | 0.8 | Low |
| Egypt | 10.9 | 1.1 | Medium |
| France | 67.4 | 12.4 | - |
| Italy | 39.7 | 13.4 | Low |
| Morocco | 134.5 | 18.9 | Low |
| Portugal | 29.1 | 32.2 | High |
| Spain | 91.3 | 18.2 | Low |
| Tunisia | 19.5 | 12.6 | Medium |
| Turkey | 71.1 | 9.3 | Medium |

Preliminary analysis – strategic objective 1 (ICCD/CRIC(17)/2

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https://www.unccd.int/sites/default/files/sessions/documents/2019-03/ICCD_CRIC%2817%29_2-1822319E.pdf

# Status of land degradation

Preliminary analysis – strategic objective 1 (ICCD/CRIC(17)/2 National UNCCD report
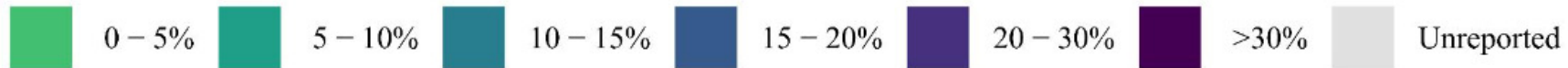
Legend: 0 – 5% | 5 – 10% | 10 – 15% | 15 – 20% | 20 – 30% | >30% | Unreported

https://www.unccd.int/sites/default/files/sessions/documents/2019-03/ICCD_CRIC%2817%29_2-1822319E.pdf

# LDN reports: Some examples

THE GLOBAL MECHANISM
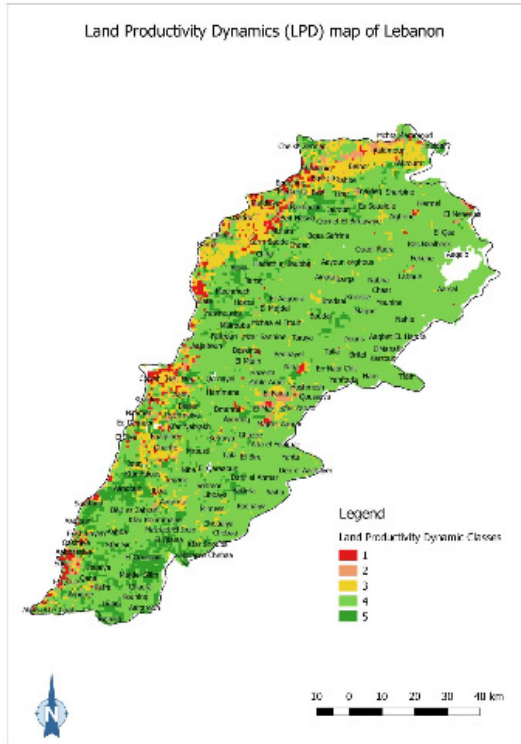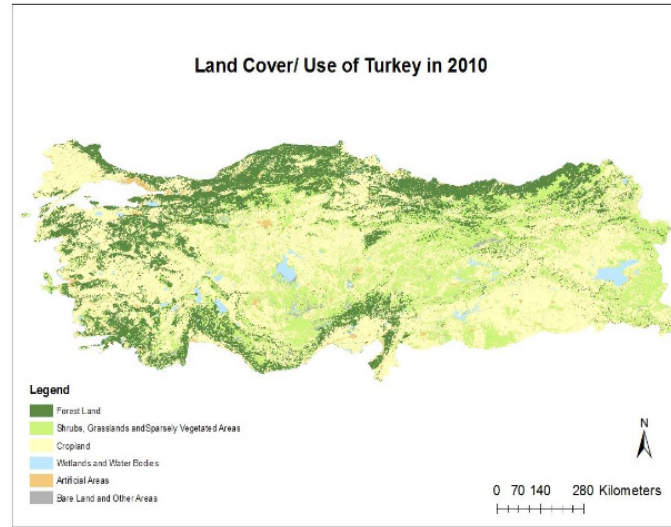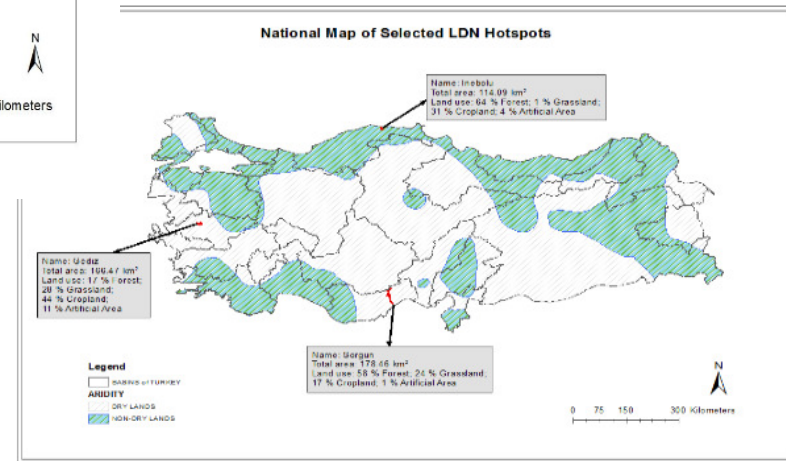United Nations Convention
to Combat Desertification

VI MFW
Mediterranean
Forest Week

Land Productivity Dynamics (LPD) map of Lebanon

Legend
Land Productivity Dynamic Classes
1
2
3
4
5

Figure 8. LPD trends of Lebanon from global datasets provided by UNCCD for LDN TSP



Land Cover/ Use of Turkey in 2010

Legend
Forest Land
Shrubs, Grasslands and Sparsely Vegetated Areas
Cropland
Wetlands and Water Bodies
Artificial Areas
Bare Land and Other Areas

0  70 140    280 Kilometers

Map 3.1 Turkey's land cover status as of 2010 (EC-JRC) (See Annex 4)

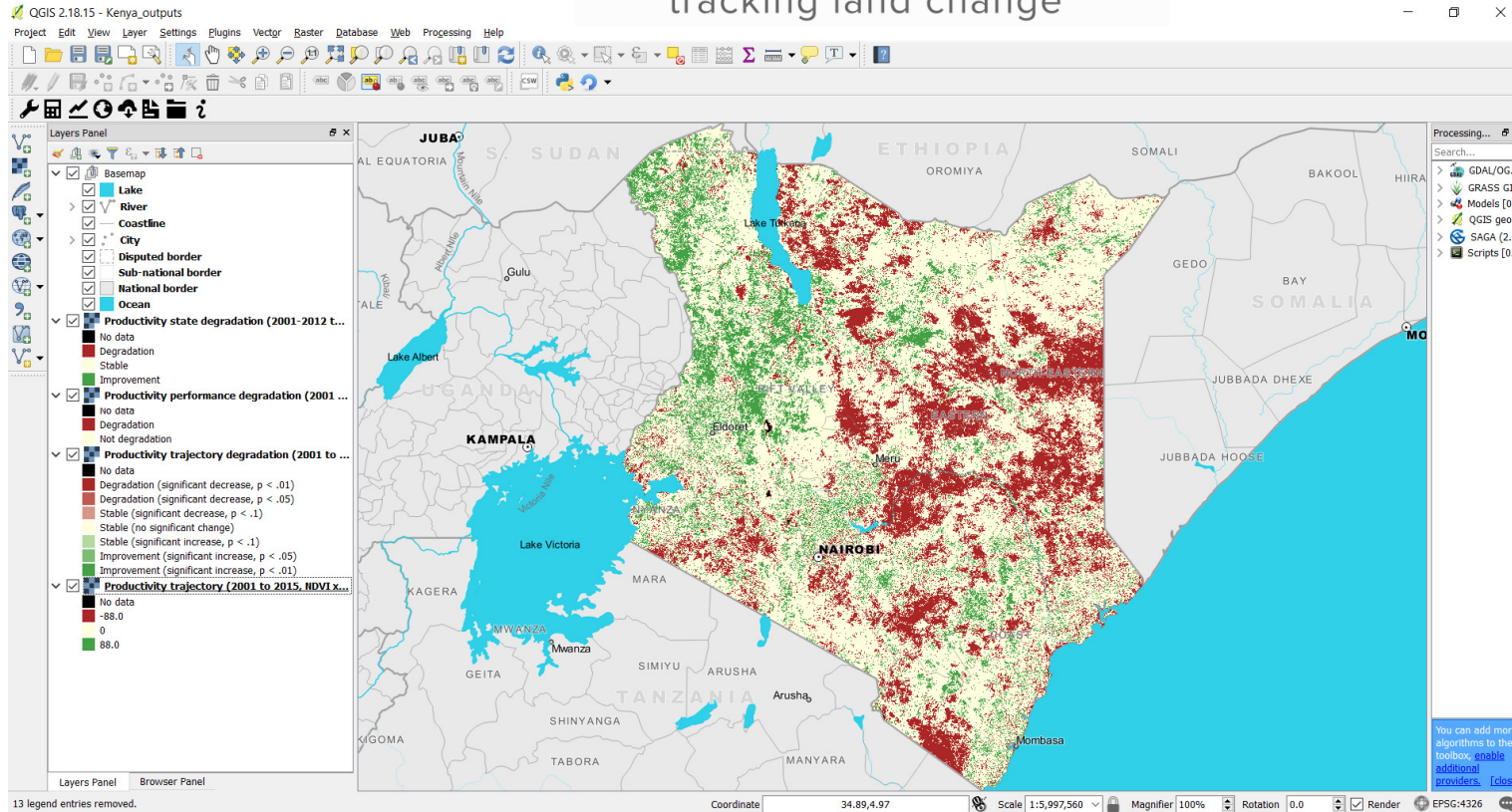**5. LDN based monitoring and planning at country level**



National Map of Selected LDN Hotspots

Name: Inebolu
Total area: 114.09 km²
Land use: 64 % Forest; 1 % Grassland;
31 % Cropland; 4 % Artificial Area

Name: Uzdız
Total area: 100.47 km²
Land use: 17 % Forest;
20 % Grassland;
44 % Cropland;
11 % Artificial Area

Name: Gorgun
Total area: 178.66 km²
Land use: 58 % Forest; 24 % Grassland;
17 % Cropland; 1 % Artificial Area

Legend
BASINS of TURKEY
ARIDITY
DRY LANDS
NON-DRY LANDS

0   75   150    300 Kilometers

Map 5.1 LDN hot spots and pilot sites.

# LDN reports: Some examples



http://trends.earth/docs/en/about/general_info.html
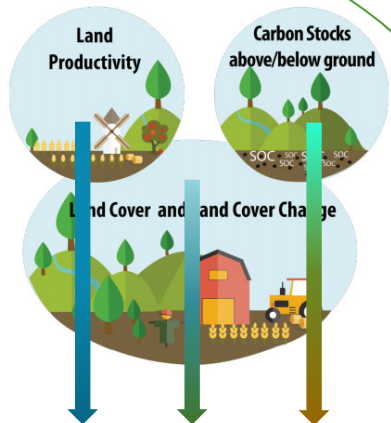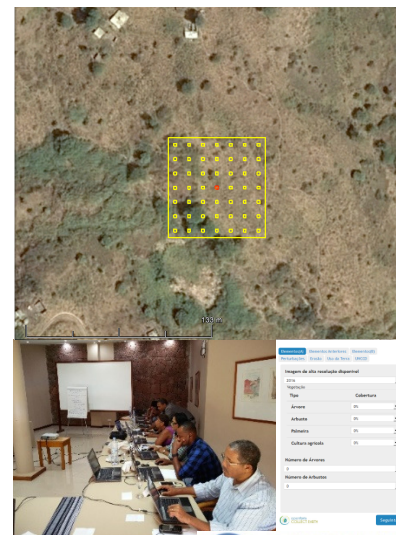
Sub-Indicators
UNCCD (CBD, UNFCCC)
Reporting Mechanisms

Land Productivity

Carbon Stocks above/below ground

Land Cover and Land Cover Change

Tier 1

SOC

LCC

Default data

LPD

openforis COLLECT EARTH

LCC

Tier 3

SOC

Tier 2

National Data

Food and Agriculture Organization of the United Nations

"For the first time, all countries can contribute equally to global assessments of land degradation and define their own restoration opportunities" said René Castro, Assistant Director-General of FAO's Climate, Biodiversity, Land and Water Department, at COP13 in Ordos, China.

# Collect Earth and the LDN process in Cape Verde – Case Study
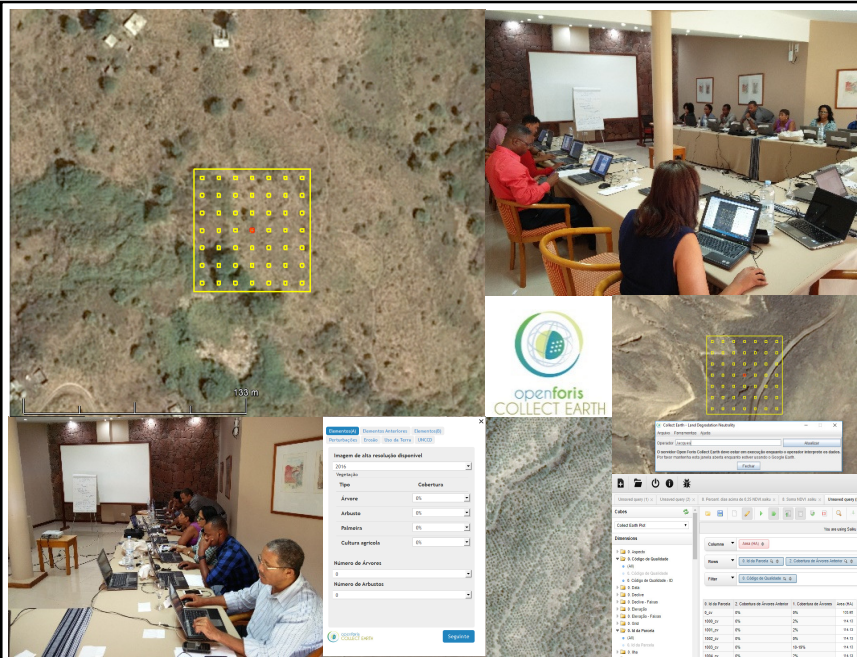
**Land use change**
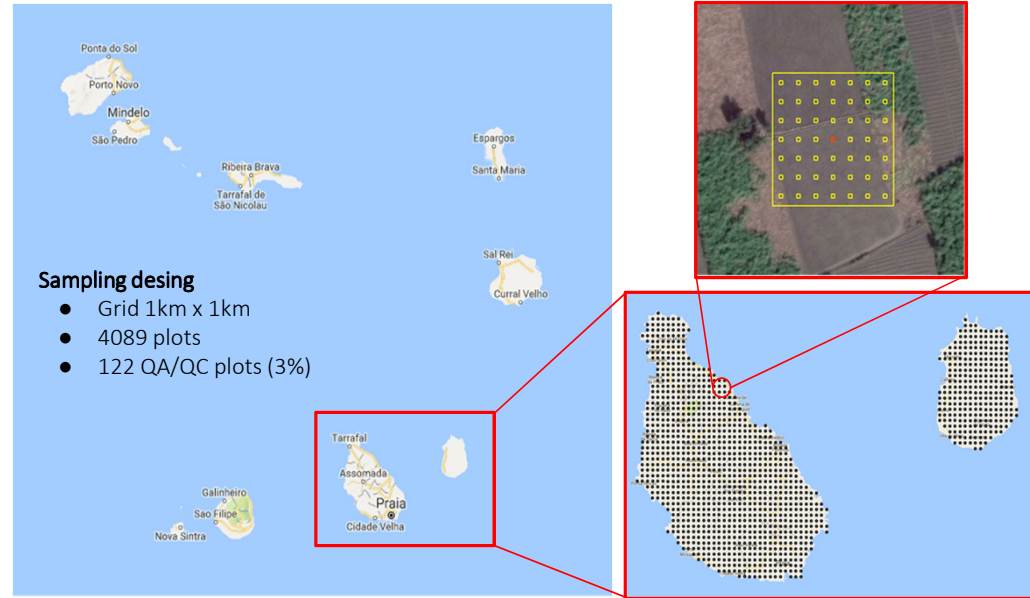An area of 2,047 hectares hectares was identified as a conversion that contributes to degradation.

15,623 hectares are conversions that represent a gain in the quality of the land.

**Land productivity**
An area of 8,404 hectares was identified as losing productivity

**Land erosion**
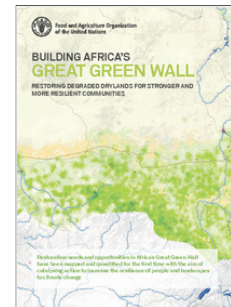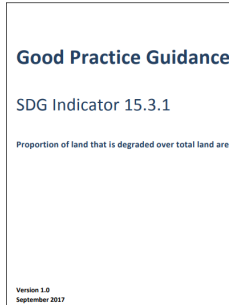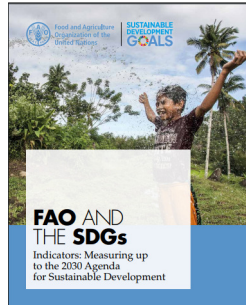Erosion was detected in 40% of the total area, half was productive areas

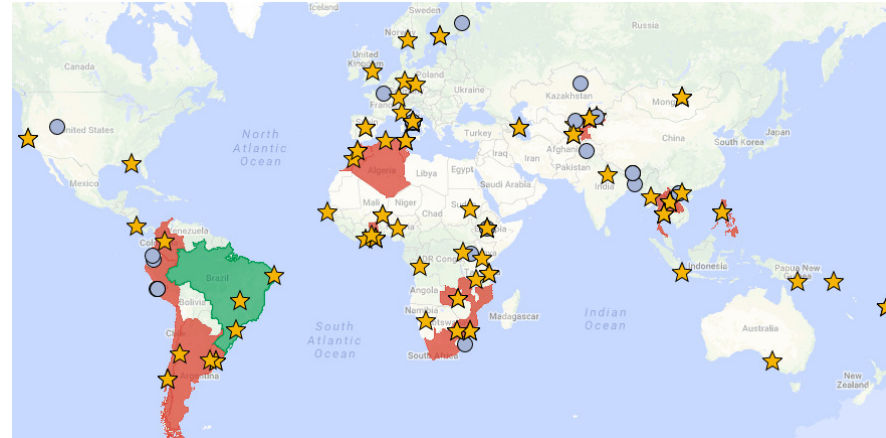Sampling desing
- Grid 1km x 1km
- 4089 plots
- 122 QA/QC plots (3%)

**>2000 professionals trained in 40+ countries**



SDG Indicator 15.3.1

Proportion of land that is degraded over total land area

Version 1.0
September 2017

FOREST GEOGRAPHY

SATELLITE EARTH OBSERVATIONS IN SUPPORT OF THE SUSTAINABLE DEVELOPMENT GOALS

Special 2018 Edition

Remote Sens. **2016**, *8*(10), 807; doi:10.3390/rs8100807

Open Access    Article

Collect Earth: Land Use and Land Cover Assessment through Augmented Visual Interpretation

Others…

# THANK YOU

**Contact us!**
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