



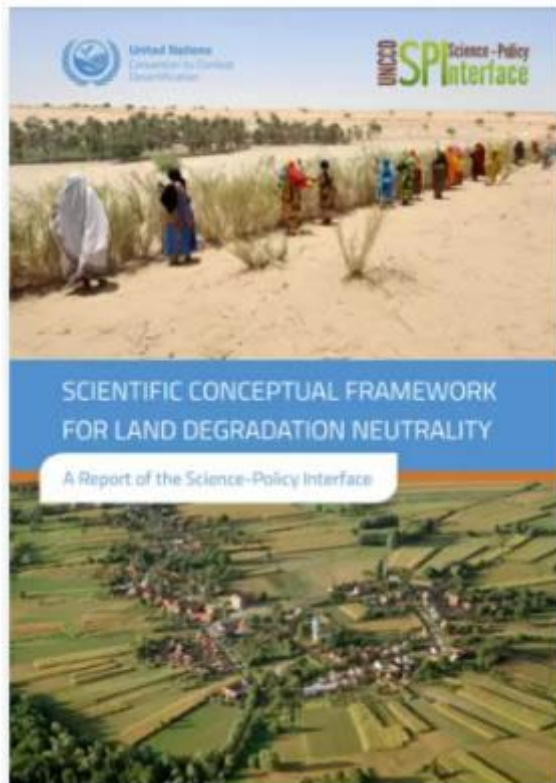
# GEO Land Degradation Neutrality Flagship

Neil Sims

Australia's National Science Agency



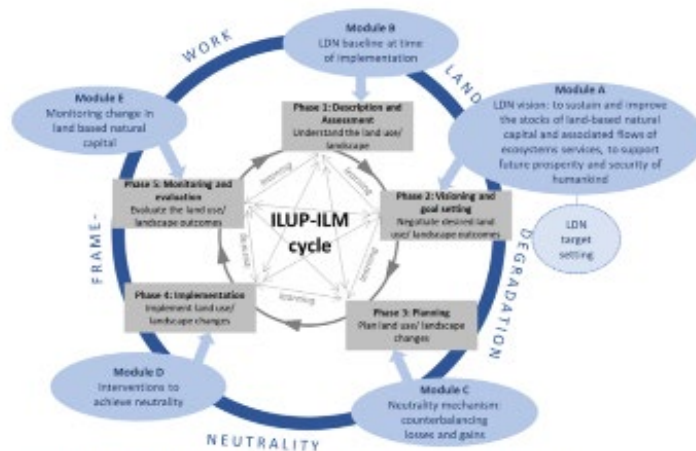
# LDN, GPG, GEO



2017



2016, 2017, 2021, 2025



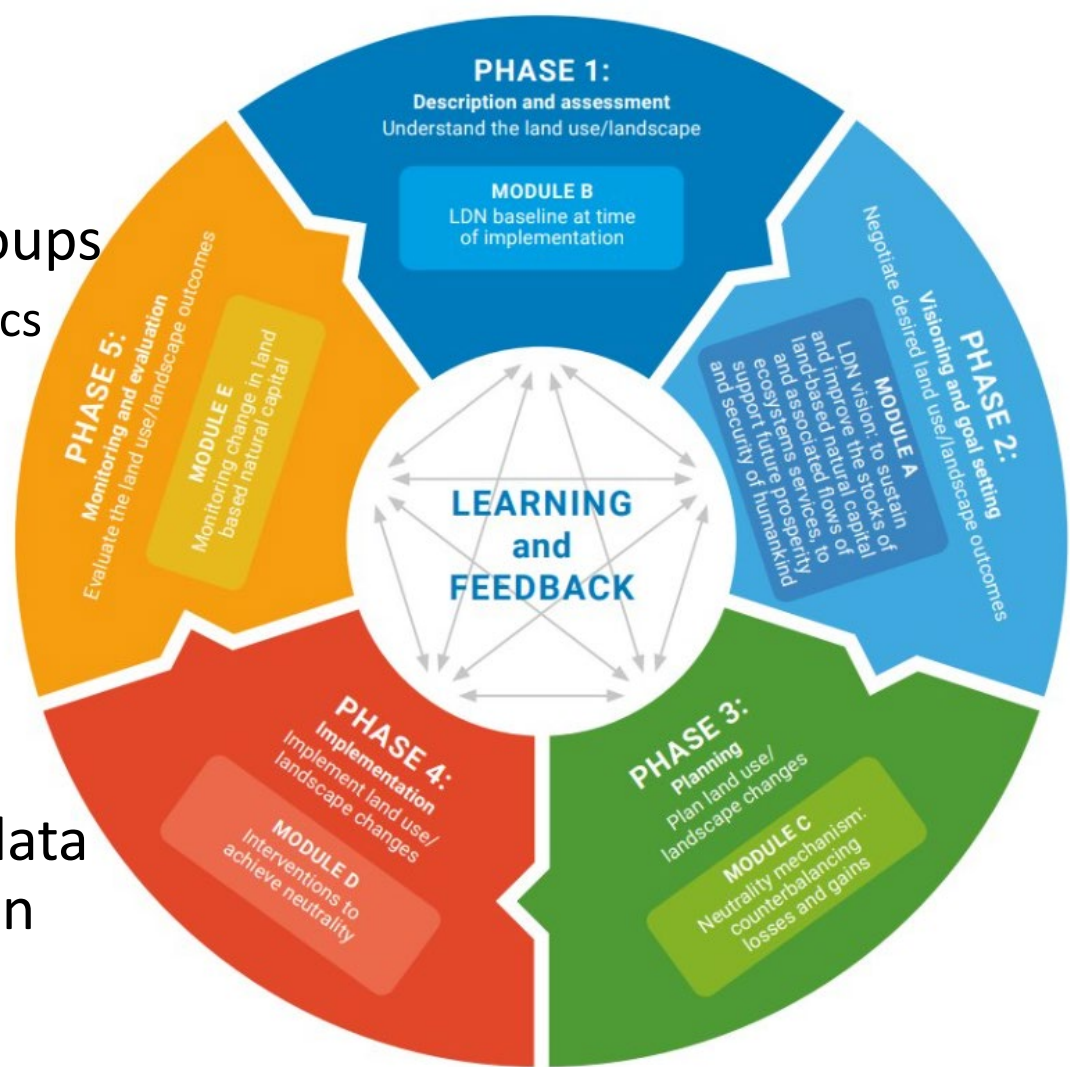
Source: 2022 UNCCD Science Policy Interface Review of LDN entry points (see link above)

2018

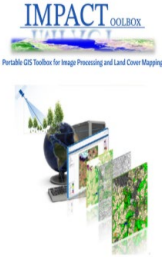
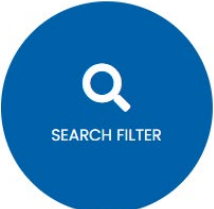


# GEO LDN & ILUP

- Three(ish) Working Groups
  - Data, Standards & Analytics
  - Capacity Development
  - Decision Support
  
- Translate science and data into planning and action



# LDN Toolbox (https://geo-ldn.org/ldn-toolbox/)



**TRENDS.EARTH**  
tracking land change  
from Conservation International

Jan. 25, 2023  
**Trends.Earth**  
Trends.Earth, integrated into QGIS, serves as a valuable tool for tracking SDG 15.3.1 and assessing...

Keywords: SDG 15.3.1  
[Learn More](#)

July 26, 2022  
**IMPACT Toolbox**  
The IMPACT (Image Processing ) Toolbox is a Free and Open Source browser-based application, develop...

Keywords: SLM, land use planning (LUP), land restoration  
[Learn More](#)

Nov. 3, 2023  
**LandPKS**  
LandPKS (Land Potential Knowledge System) is a cloud-based decision support tool that leverages cro...

Keywords: land use planning (LUP)  
[Learn More](#)

Oct. 31, 2023  
**WOCAT-LADA-DESIRE M...**  
The WOCAT-LADA-DESIRE mapping tool offers guidelines and a questionnaire to integrate spatial land ...

Keywords: SLM  
[Learn More](#)

Oct. 31, 2023  
**LUP4LDN**  
LUP4LDN (Land Use Planning for LDN) is a web-based tool that empowers users to visualize and assess...

Keywords: land use planning (LUP)  
[Learn More](#)



# Analytics and Reporting

The screenshot shows the Trends.Earth software interface. On the left, the 'Recent Projects' panel lists several projects, including 'Calculate indicators', 'Step 1: Prepare sub-indicators', and 'Step 2: Calculate final SDG 15.3.1 indicator'. The main window displays the 'Calculate Productivity' dialog box, which includes options for trajectory indicators, performance measures, and climate datasets. Below this, there are two more windows: 'Calculate Land Cover Change' and 'Calculate Soil Degradation Carbon'. The 'Calculate Land Cover Change' window shows a grid of land cover types (Forest, Grassland, Cropland, Urbanland, Artificial, Bare land, Water body) and their status (Increased, Decreased, No change) in a color-coded matrix. The 'Calculate Soil Degradation Carbon' window shows options for climate regions and default values.

Trends.Earth

The screenshot shows the UNCCD Data Dashboard website. The header features the logos for 'pra.r4' and 'United Nations Convention to Combat Desertification'. The main content area has a large image of a desert landscape with the text 'UNCCD Data Dashboard' and a sub-headline: 'A site where core topics under our mission and mandate can be explored through the information submitted by country Parties in their national reports during the 2022 reporting process'.

## Land degradation and drought

Land degradation is increasing at a steady rate

**1.56**  
billion ha  
of degraded land reported

15.4 % of the reported land is degraded, an increase of 4 % in four years.

[See trends in land degradation here](#)

**15**  
countries  
severely affected by drought

Drought's hazard is far reaching

Out of 98 countries affected by drought, 15 have experienced severe or extreme drought over some or all of their territory.

[See drought affected areas here](#)

UNCCD Data portal (<https://data.unccd.int/>)



# Data sets – Global Default

Sub-indicator	Default data provided for 2018 reporting	Alternatives
Land Cover	ESA-CCI-LC <sup>43</sup> 300m annual global from 1992 to 2019	Copernicus CGLS-LC100 (Collection 3) <sup>44</sup> 100m annual global from 2015 to 2019
Land productivity	JRC Land Productivity Dynamics (LPD) <sup>45</sup> 1km annual global from 1999-2013	MODIS vegetation index (MOD31Q1, MYD13Q1) <sup>46</sup> 250 m global, 16-day integration period since 2000 Copernicus Global Land Service NDVI, <sup>47</sup> 1km annual global since 1998.
SOC	ISRIC SoilGrids250m <sup>48</sup> 250 m global spatial predictions for selected soil properties at six standard depths	ISRIC SoilGrids250m version 2 (de Souza et al. 2020), updated global product at 250 m spatial resolution with spatial uncertainty. FAO Global Soil Organic Carbon Map <sup>49</sup> , global and national maps of SOC stocks at 1 km spatial resolution; latest version 2019. <small>*<a href="https://soilsrevealed.org/">https://soilsrevealed.org/</a></small>

FAO-WOCAT  
LPD

Trends.Earth  
(MODIS)

- 30m dataset now available for SIDS

# Global default data – Land cover

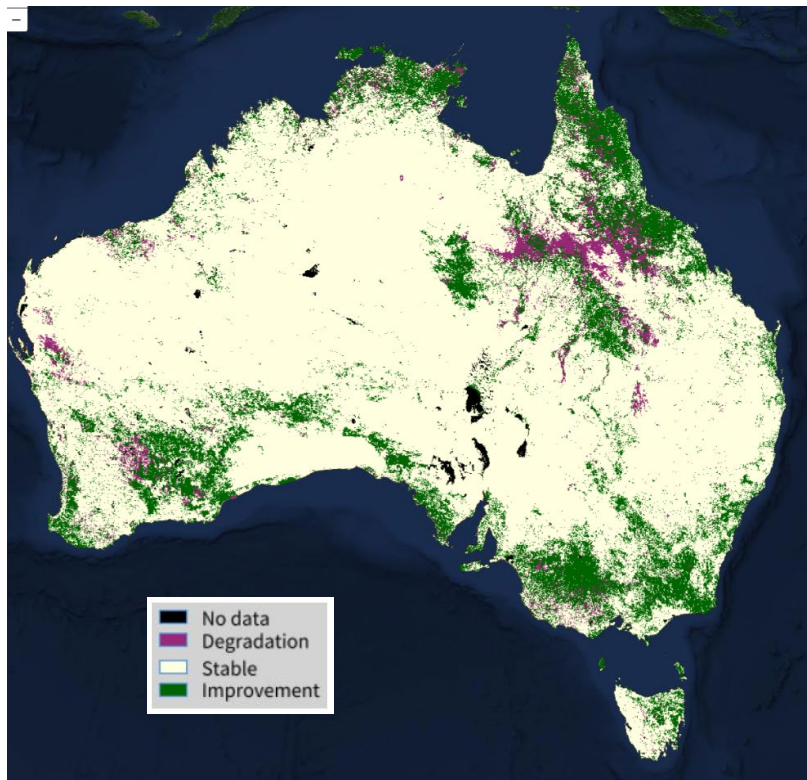


		FINAL CLASS					
IPCC Class	Forest Land	Grassland	Cropland	Wetlands	Settlements	Other Land	
ORIGINAL CLASS	Forest Land	Stable	Vegetation loss	Deforestation	Inundation	Deforestation	Vegetation loss
	Grassland	Afforestation	Stable	Agricultural expansion	Inundation	Urban expansion	Vegetation loss
	Cropland	Afforestation	Withdrawal of Agriculture	Stable	Inundation	Urban expansion	Vegetation loss
	Wetlands	Woody Encroachment	Wetland drainage	Wetland drainage	Stable	Wetland drainage	Wetland drainage
	Settlements	Afforestation	Vegetation establishment	Agricultural expansion	Wetland establishment	Stable	Withdrawal of Settlements
	Other Land	Afforestation	Vegetation establishment	Agricultural expansion	Wetland establishment	Urban expansion	Stable

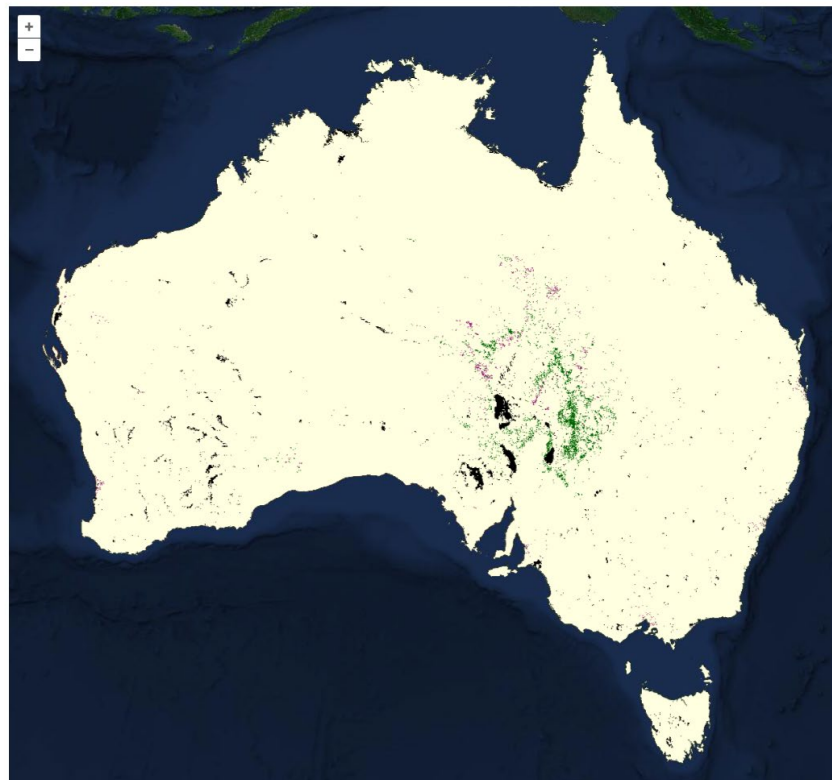


ESA CCI-LC

# Global default data – Land productivity & SOC



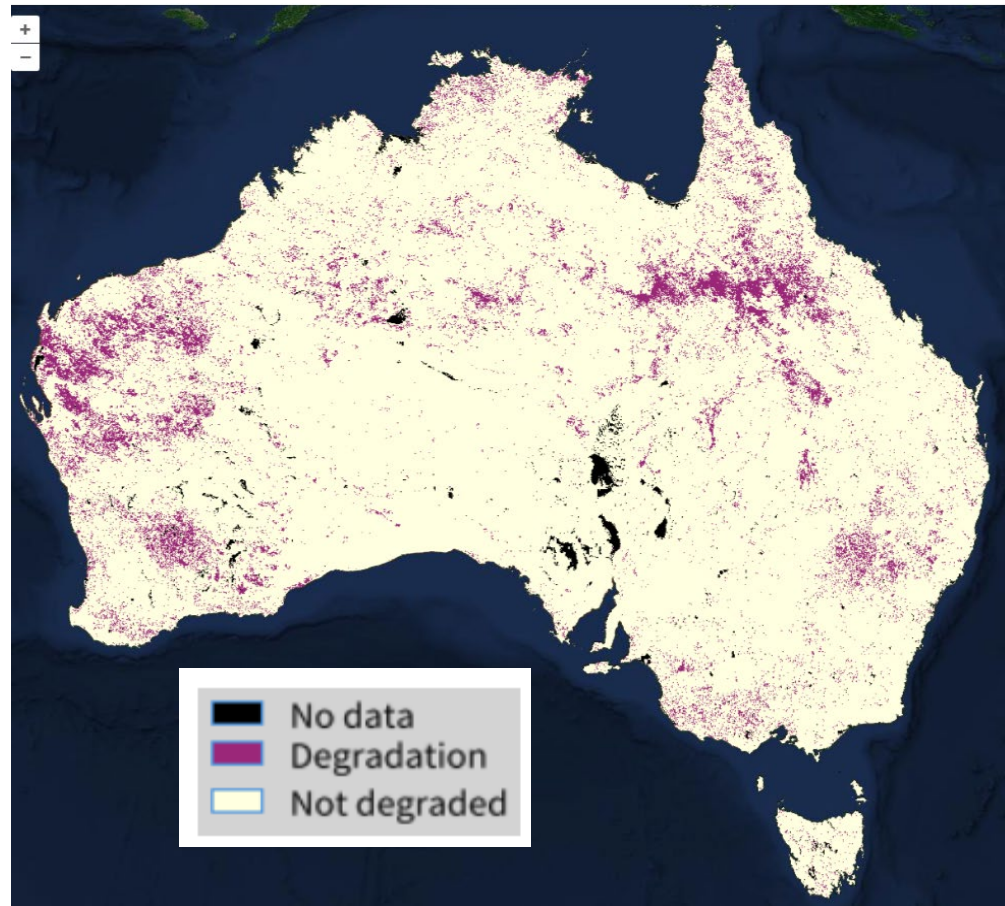
JRC LDP



Soil Grids 250m

# Land Degradation 2016-2019 (Default)

- Shows new and persistent degradation relative to the baseline (2000-2015)

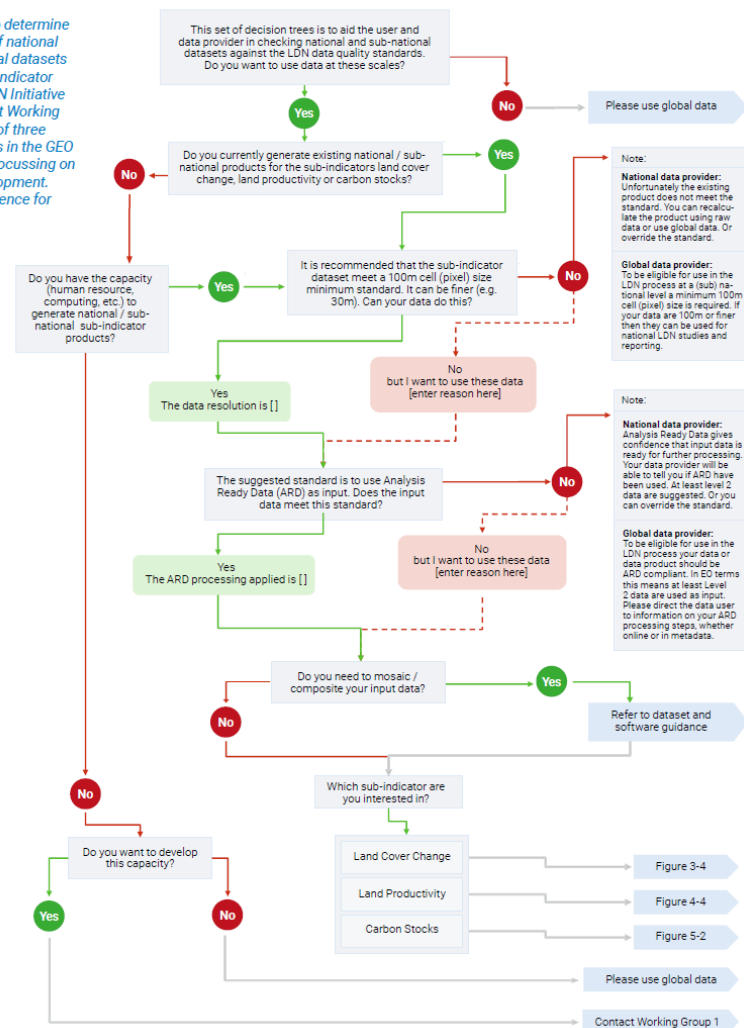


# Reporting & Data Standards

- Decision trees in the GPG
- OGC Geospatial Reporting Indicators Standards Working Group (<https://portal.ogc.org/files/107038>)
- Develop portfolio of open standards
- Accelerate development and adoption of standards-based geospatial technologies
- Initial focus on LDN

Figure 2-2

Decision tree to determine the suitability of national and sub-national datasets for calculating Indicator 15.3.1 (GEO-LDN Initiative 2020). Note that Working Group 1 is one of three Working Groups in the GEO LDN Initiative, focussing on Capacity Development. See link in reference for more details).



# Capacity Development

- Postgraduate Programmes
  - University of Energy and Natural Resources, Ghana
- Monthly online seminars
- Global and Regional Dialogue Forums
- Online Support Sessions
- E-learning courses
- Regional Helpdesks



Seminar 1



Seminar 2



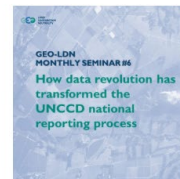
Seminar 3



Seminar 4



Seminar 5



Seminar 6



Seminar 7



Seminar 8 Special Edition



Seminar 9

# Decision Support

**APACHETA** **Apacheta Team & GEO LDN Working Group 4 Events** **"The Earth Talks"**

**MON 05** 12:00-12:30 / ODOK BOOTH  
LAND PRODUCTIVITY DYNAMICS AT HIGH RESOLUTION FOR SIDS AND 30M RESOLUTION NDVI TIME SERIES FOR 2000-2023 WITH CESAR GARCIA (APACHETA - WG4)

**MON 05** 16:00-17:30  
COMMUNITY EVENT: EO FOR LAND: THE POWER OF COLLABORATION FOR COUNTRY IMPACT

**MON 05** 13:00-14:00 / EUROGEO BOOTH  
ROUND TABLE: MANAGING DROUGHTS, FLOODS, AND LAND DEGRADATION IN VULNERABLE REGIONS WITH CESAR GARCIA (APACHETA - WG4) AND GABRIEL DALDEGAN (CI - WG3)

**TUE 06** 16:00-16:30 / ODOK BOOTH  
GEO KNOWLEDGE HUB AND THE GEO-LDN COUNTRY APPROACH ON THE EXAMPLES OF COLOMBIA AND GHANA

**LAND DEGRADATION NEUTRALITY**



**Land Degradation Neutrality** **UNU EHS**

## Regional Dialogue Forum for Pacific Small Island Developing States 2025

**Deadline of applications: 11:59 pm CET 28th of February 2025**



Image source: GEO-LDN Archive



# Challenges & opportunities

- Lack of consistent global land cover data
- Diversity of NPP methods
- Difficulty assessing SOC, absence of full C dataset
  - but see ESA Biomass
- Coarse resolution of default datasets
- Combining datasets of different frequency and resolution
  - Baseline and reporting periods
- Climate calibration
  - Attribution and forecasting

## 1. DETAILS OF SDG INDICATOR 15.3.1

<b>INDICATOR</b>	15.3.1 Proportion of land that is degraded over total land area	
<b>Target</b>	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	
<b>Custodian Agency</b>	United Nations Convention to Combat Desertification (UNCCD)	<b>TIER</b> I

The UNCCD has defined three sub-indicators of SDG indicator 15.3.1: i) trends in land cover (Strategic Objective SO 1-1), trends in land productivity or functioning of the land (SO 1-2) and iii) trends in carbon stocks above and below ground (SO 1-3). With the Good Practice Guidance (GPG, Version 1.0, 2017 and Version 2.0, 2021), the UNCCD has established a universal methodology for reporting on SDG 15.3.1.

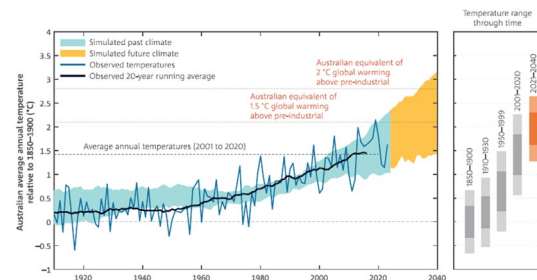
### Approach

Indicator 15.3.1 reports the proportion of land that is degraded over total land area. Land degradation is defined as "the reduction or loss of the biological or economic productivity and complexity of rain fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from a combination of pressures, including land use and management practices" (UNCCD, 1994).

The total proportion of land that is degraded over total land area is given by:

$$P_n = \frac{A(\text{degraded})_n}{\sum_i A(\text{Total})}$$

[https://ceos.org/document\\_management/Ad\\_Hoc\\_Teams/SDG-AHT/Support%20Sheets/SDG\\_15.3.1\\_EO\\_Support\\_Sheet\\_v2025\\_1.pdf](https://ceos.org/document_management/Ad_Hoc_Teams/SDG-AHT/Support%20Sheets/SDG_15.3.1_EO_Support_Sheet_v2025_1.pdf)



# Key connection points

- Custodian agency
  - UNCCD for SDG 15.3.1 & LDN
- Funding bodies
  - GIZ, BMZ
- National focal points
  - GEO
  - United Nations
- Implementing actors
  - Public and private sector
    - Data, dataset development, training, industry advocacy, collaboration, planning, implementation





Thank you

**Neil Sims**

[Neil.Sims@csiro.au](mailto:Neil.Sims@csiro.au)



Land  
Degradation  
Neutrality