
WP23_25: GEO Land Degradation Neutrality

1304,172

Basic Information

Full title of the Initiative

GEO Land Degradation Neutrality

Short Title or Acronym

GEO-LDN

Current category in the 2020-2022 GWP

GEO Initiative

Proposed category in the 2023-2025 GWP

GEO Flagship

Points of Contact

First Name	Last/Family Name	Email
Antje	Hecheltjen	antje.hecheltjen@giz.de
Sara	Minelli	sminelli@unccd.int
Neil	Sims	Neil.Sims@csiro.au
Amos	Kabo-Bah	amos.kabobah@uenr.edu.gh
Laurent	Durieux	ldurieux@geosec.org

Purpose

Objective

The GEO-LDN Initiative supports UNCCD Parties in monitoring land degradation for reporting and implementing measures to achieve or exceed LDN.

Please provide a short description of the Initiative

The GEO-LDN Initiative promotes the collaborative development, and supports the provision and use, of Earth Observation (EO) datasets, quality standards, analytical tools and capacity building to avoid, reduce, and reverse land degradation with the aim of achieving land degradation neutrality (LDN) in all countries by 2030 (Sustainable Development Goal (SDG) target 15.3). The Initiative helps connecting data providers to data users, including researchers, decision-makers, land use planners, commercial sector, donors/investors and other stakeholders in order to optimize the use of EO datasets for LDN assessment, planning, implementation, monitoring and reporting.

Why is this Initiative needed?

In order to halt, reduce and reverse the current trends in land degradation, there is an urgent need to enhance national capacities to measure and map degraded lands and identify the most appropriate interventions. Increased access to large EO datasets, targeted data products, improved analytical capacity and practical tools are needed to help countries understand and report on the status and trends of land degradation, set and implement LDN targets, and scale up integrated land use planning, sustainable land management and restoration efforts.

What evidence is there to support this need?

The GEO-LDN Initiative responds to a call made by the Conference of the Parties (COP) of the United Nations Convention to Combat Desertification (UNCCD) to support Parties' efforts in implementing the Convention by providing space-based information and in situ measurements to assist countries in fulfilling the reporting requirements for SDG indicator 15.3.1 ("proportion of land that is degraded over total land area") and fostering data access, national data capacity-building and the development of standards and protocols (Decision 9/COP.13). Although to date 128 countries have committed to setting LDN national voluntary targets, and more than 100 countries have already set their targets, capacities to track progress towards these targets are limited. As the custodian agency for SDG indicator 15.3.1, the UNCCD secretariat supports national uptake of EO methods data and tools to monitor and report on the proportion of degraded land by using three sub-indicators (i.e., land cover, land productivity and carbon stocks) that rely, to a large extent, on EO and geospatial information. A coordinated response from the EO and geospatial community is urgently needed to support these efforts. The GEO-LDN Initiative, which involves numerous GEO Members and Participating Organizations (Pos), is well-positioned to assist the UNCCD and its 197 contracting parties with the provision and deployment of EO datasets, country support, capacity building and training, and EO tools and platforms so that countries can effectively monitor and report on SDG indicator 15.3.1, and track progress towards LDN targets, but more importantly so that decision-makers have actionable information at their fingertips to make better informed policies and investments. The assets of the GEO community would be utilized specifically to (1) leverage its convening power to turn information into knowledge and package it for user-centric tools, applications and services; (2) identify existing data and information gaps at national and project levels; (3) mobilize action to reduce these gaps by empowering countries and organizations to strengthen and develop their own capacities through the leveraging of technical assistance and increased access to EO datasets and products; and (4) link to socio-economic and other relevant data through partnerships in order to provide actionable information for decision-making.

Is this Initiative open to participation by representatives of any GEO Member, Participating Organization, and GEO Associate?

Yes

Are you aware of other projects or initiatives at a global or regional scale (both in GEO and externally) that provide similar products or services?

Yes

Please describe.

Crucial datasets for land degradation monitoring such as land cover change are also used or provided by other Initiatives and institutions. The GEF-funded project Tools4LDN is closely related to GEO-LDN. Initiatives that emerged during the Decade for Ecosystem Restoration such as the global restoration observatory (GRO) are related to the work of GEO-LDN but not targeting LDN specifically. Upcoming GEF-funded projects on land use planning are a good vehicle for up- and outscaling GEO-LDN tools and services such as LUP4LDN.

How is this Initiative unique?

This Initiative is unique given the mandate from the UNCCD Conference of Parties to assist national reporting on land degradation neutrality commitments with EO. It is also the only Initiative that provides specific guidance on how to incorporate EO for assessment of SDG 15.3.1 and its sub-indicators.

Please identify the most important actual and/or intended outputs (products, services, etc.) produced by the Initiative, along with their intended and/or actual users. This list does not need to be comprehensive but should identify the outputs which are most used and are expected to have the greatest potential impact.

Output	Status	Users	Additional info
Postgraduate Programme on LDN (Master and Phd) including scholarship programme	In development	MSc and PhD students, next generation of spatial data scientists	Stakeholder engagement on proposed curriculum in Land Degradation Neutrality (LDN) held on 10th December, 2021 at the Mensvic Grand Hotel, East Legon, Ghana
Virtual Capacity Building formats such as Massive Open Online Courses (MOOCs)	Planned	Professionals in land use planning	
Dialogue Forums for Stakeholder Engagement and Knowledge Exchange	In development	stakeholders of the UNCCD Parties, land use planners, national and sub-national organizations active in land use/management planning, policy makers, land users and research agencies	The yearly dialogue forums are part of both, the co-design and the capacity development approach. Yearly dialogue forums will start from 2023 and will build on a workshop series in 2022 organized by GEO-LDN with ELD, WOCAT, UNCCD and FAO (https://fda.eld-initiative.org/index.html)
Minimum data quality standards and decision trees for SDG Indicator 15.3.1	Occasionally updated	Countries reporting on SDG Indicator 15.3.1 and data providers	The minimum data quality standards and decision trees for SDG Indicator 15.3.1 were the outputs of a GEO-LDN consultative process which in 2020 involved over 30 data providers/experts and 100 data users. These outputs have been integrated in the UNCCD Good Practice Guidance for SDG Indicator 15.3.1 (V2) and have contributed to the enhancement of Trends.Earth by Conservation International. They will be used by all 197 Parties to the UNCCD in the preparation of their national reports during the UNCCD 2022 reporting process. Some of the agreed standards are aspirational, identifying key data needs for assessing SDG

			indicator 15.3.1 as a guide for data providers, particularly for supporting national scale assessments.
Land Use Planning for Land Degradation Neutrality (LUP4LDN) tool	Occasionally updated	Land use planners, national and sub-national organizations active in land use/management planning, policy makers, land users and research agencies	The LUP4LDN tool is the winning tool of an international technology innovation competition organized by the GEO-LDN Initiative to design and build software analytics solutions to support more transparent and well-informed land use decisions at the local to national level across the globe. The analytics software features a 'neutrality mechanism', which refers to a no net loss land use planning module that would allow users to generate scenario maps of the anticipated future impact of all land uses for a given area in net terms. LUP4LDN moves beyond analysing data as it brings stakeholders together and directly facilitates collaborative land use planning and the process guidance provided is applicable globally.
Federated System	In development	Data analyst, geospatial professionals, environmental researchers, land use planners, reporting agencies	The ambition of WG3 is to provide a suite of inter-operable geospatial and other datasets and analytical tools that can be used to measure and monitor land degradation, and plan to achieve LDN at scales from local to regional. The development of LUP4LDN was an outcome of a competition run through WG3 on data analytics. Trends.Earth has also been supported through this WG.

If needed, please provide additional comments or explanation to accompany the

outputs table

The key planned outputs of the GEO-LDN Initiative are: 1. Federated System: The UNCCD Parties will have at their disposal a federated system for geospatial data integration and analysis for further development. The federated system for planning, monitoring and reporting on land degradation neutrality will be set up in a user-oriented and gender-sensitive process ('design with the user'). A quality review process for new elements of the federated system according to the minimum technical and content standards defined by the GEO-LDN Initiative will be set up. This will improve the access to space-based information and in situ measurements for the three sub-indicators, namely, changes in land cover, land productivity and carbon stocks. Effective reporting on SDG indicator 15.3.1 will require the use of multiple types and sources of data, including those generated and used at national and sub-national (local project) levels as well as new sources of data developed outside of national statistical systems, such as global and regional geospatial data sets, including EO data sets. The complementarity, integration and harmonization of available geo-referenced data will help increase the accuracy of change detection in the sub-indicators and significantly reduce the costs of monitoring and reporting on the indicator, while at the same time increasing policy relevance. 2. Capacity Development: Training opportunities will be strengthened to improve the capacity of relevant stakeholders in local digital ecosystems of the Parties to apply the federated system for planning, monitoring and decision-making processes to achieve land degradation neutrality. An international postgraduate programme will be accredited to enable partners to further develop and apply geospatial analysis tools for planning, monitoring and decision-making processes. 500 people, at least 40% of whom will be women, will receive digital training opportunities in the further development and application of geospatial analysis tools for planning, monitoring and decision-making processes. It is vital that the training and technical solutions are practical and self-sustaining and that they address the size and complexity of the data selected for each country. Training on the use of available tools for accessing, processing, analyzing and interpreting data as well as validation techniques would ideally be done in collaboration with National Statistical Offices (NSOs), specialized agencies and the "main reporting entity" for the indicator. For land use and spatial planning frameworks to implement measures to achieve LDN, the curriculum will also include reference to other target systems and reporting obligations at national level to maximize synergies and avoid duplication of efforts. Regional focus will be used where appropriate. 3. Stakeholder engagement and knowledge exchange: The exchange of knowledge and experience between stakeholders of the UNCCD Parties on the application of the federated system for planning and decision-making processes will be strengthened. Yearly cross-country and cross-sectoral gender-sensitive dialogue forums will be held with selected partner countries. In the dialogue forums, recommendations will be formulated for inclusion in UNCCD processes and national policy-making of the selected partner countries. 4. Contribution to GEO Knowledge Hub (GKH): all tools, information and EO applications developed in the GEO-LDN Initiative will be open-science/open-source and contributed as knowledge packages to the GKH in order to maximize uptake by relevant national/regional authorities.

What kinds of decisions are the outputs of this Initiative primarily intended to support?

With its outputs, GEO-LDN intends to support evidence-based, transparent, conscious decisions on sustainable land use with the aim to reach or exceed LDN in the countries by 2030.

How will these decisions benefit from the outputs of this Initiative?

This Initiative will provide data and analytics tools that are quality assured and fit for purpose for measurement, monitoring and planning in a way that is consistent with the SDG processes. Provision of these tools and datasets through a collaborative effort between GEO-LDN and UNCCD can give decision makers confidence that their analyses will meet the requirements of the SDG process, support their land use planning needs and provide an assessment that is consistent with others globally.

What kinds of impacts (for example, reduced loss of life, monetary savings, conservation of biodiversity, etc.) are anticipated as a result of the use of the outputs of this Initiative?

Desertification and land degradation are major drivers of loss of agricultural and environmental productivity and integrity. These factors can lead to dislocation of people from their lands, including to the migration of human and animal communities across political borders. By improving the quality and availability of data to measure, monitor and predict land degradation, the GEO-LDN Initiative will reduce the impacts of desertification and inappropriate land use on agricultural and ecological systems, and improve the livelihoods of literally billions of people that rely on sustainable productivity for their prosperity. Halting and reversing land degradation trends will

help deliver multiple SDGs, climate action in terms of enhanced carbon sequestration and reduced emissions, and increased resilience to slow onset disasters. Our future economic growth, prosperity and human wellbeing depend upon whether we can achieve a healthy and sustainable balance between our natural and working landscapes. Over 800 million people are estimated to be chronically undernourished, often as a direct consequence of land degradation, declining soil fertility, unsustainable water use, drought and loss of biodiversity. Sustainable land use practices can improve water efficiency and quality in a cost-effective way as well as the restoration of 5 water-related ecosystems which are essential to mitigate water scarcity. This is an important precondition to achieve access to adequate and equitable sanitation and hygiene for all. By 2030, almost 60 per cent of the world's population will live in urban areas. It is critical to promote integrated spatial development planning approaches to optimize the allocation of land resources that human settlements in urban and peri-urban areas rely upon.

Has this Initiative been asked to provide specific information (for example, reports, data, services) on an ongoing basis to an international convention, organization, or other multilateral body?

Yes

Please identify the requesting organization.

United Nations Convention to Combat Desertification (UNCCD)

Describe the nature of the request.

The GEO-LDN Initiative responds to a call made by the UNCCD COP in 2017 to support Parties' efforts in implementing the Convention by providing space-based information and in situ measurements to assist countries in fulfilling the reporting requirements for SDG indicator 15.3.1 ("proportion of land that is degraded over total land area") and fostering data access, national data capacity-building and the development of standards and protocols (Decision 9/COP.13). Two years later, in 2019, welcoming the establishment of the GEO-LDN Initiative and its efforts to facilitate data access and the development of quality standards, analytical tool and innovative capacity building mechanisms, the UNCCD committed to the continued cooperation with GEO-LDN concerning land-based progress indicators and their gaps, targeted training at regional and subregional levels, as well as improving the policy-relevance of EO data, tools, and methods in relation to SDG and UNCCD reporting (Decisions 8/COP.14 and 11/COP.14). The UNCCD also called for greater support, both financially and in-kind, for the GEO-LDN initiative from international financial and civil society organizations and private sector institutions. At COP15 (Abidjan 2022), UNCCD Parties referred to GEO-LDN in seven COP-decisions (3/COP.15, 8/COP.15, 11/COP.15, 12/COP.15, 13/COP.15, 20/COP.15, 27/COP.15), "acknowledging with appreciation the important contribution of GEO-LDN to the development of data quality standards, education programmes and practical tools for the planning, implementation, monitoring and reporting of land degradation neutrality" and voicing new requests to GEO-LDN including that the COP

- "Invites the GEO-LDN Initiative to encourage the Earth observations community to develop multi-decadal high-resolution (10– 30m) interoperable data products for the land surface dating back to the year 2000 as a contribution to UNCCD reporting and SDG indicator 15.3.1 reporting"
- "Also invites the GEO LDN Initiative and its partners to support Parties in this effort by facilitating the use of Earth observation data and tools; ("this effort" refers to the previous paragraph in which the COP "Invites Parties who wish to do so to refine their voluntary LDN targets by ensuring that land degradation neutrality targets are specific, time-bound, policy coherent, quantitative, spatially explicit, gender-responsive and adequately integrated into planning frameworks".)"
- "Invites the GEO LDN Initiative and other technical and scientific partners to collaborate with the secretariat, where possible, on the development of methodologies to identify and map, at the global, national and local scales, areas which are likely to be more and less vulnerable to land degradation under various climate change scenarios, as well as areas showing signs of improvement due to restoration so that timely preventative initiatives can be implemented and returns on investments can be assessed"
- "Further invites Parties to explore ways to integrate land tenure information into their capacity development efforts and data analytic tools for evidence-based decision-making to support LDN implementation through integrated land-use planning, informed as appropriate by the GEO LDN Initiative, the FAO, the Committee on World Food Security and other relevant stakeholders".

Please provide supporting documentation of the request.

- 11_cop14.pdf ([link](#))
- 8_cop14.pdf ([link](#))
- 9cop13_0.pdf ([link](#))
- cop15_23add1_advance.pdf ([link](#))

Technical Synopsis

Please provide a brief description of the methods used by the Initiative to produce its (actual or planned) outputs.

Improving the availability and suitability of datasets for countries to report on and implement measures to achieve SDG 15.3.1 and LDN is a major focus of the GEO-LDN Initiative. In the absence of, to enhance, or as a complement to national data sources, good practice suggests that the data and information derived from global and regional data sets should be interpreted and validated by national authorities. The most common validation approach involves the use of national, sub-national or site-based indicators, data and information to assess the accuracy of the sub-indicators derived from these regional and global data sources. This could include a mixed-methods approach which makes use of multiple sources of information or combines quantitative and qualitative data, including the ground-truthing of remotely sensed data using Google Earth images, field surveys or a combination of both. The regular collection of in situ data is crucial for the validation of the three sub-indicators. Validation is important to allow proper assessment of the accuracy and precision of all three sub-indicators. The transformation of data into nationally relevant end products will occur in collaboration with countries through the Capacity Building activities of WG1, and through the products and tools developed in the activities of the Data Analytics working group (WG3). Capacity building activities are planned that will support countries to develop their own national datasets, and includes activities to support image processing, sub-indicator validation and reporting processes. WG3 aims to support the development of improved datasets and analytical tools to simplify and improve the information and tools available for countries to develop and validate national datasets, produced either from global datasets or via other data production processes such as Earth observation or spatial data analysis.

The GEO-LDN Initiative adheres to the GEO Data Sharing Principles and promotes the use of the FAIR data principles and of the Principles for Digital Development. In its technical developments it follows a co-design approach with the users.

If you would like to provide further details on the technical methods, you may upload one or more documents here.

- 20200703_geoldn_technicalnote_final_single_1.pdf ([link](#))
- unccd_gpg_sdg_indicator_1531_version2_2021.pdf ([link](#))

Are there any significant scientific or technical challenges that need to be resolved by the Initiative during the 2023-2025 period?

Yes

Please describe these challenges and the steps being taken to solve them.

The primary scientific challenges are to: 1. Create sub-indicator datasets that best represent national conditions, and 2. Improve the consistency of land degradation assessments between national and local interpretations, and between different datasets representing the same sub-indicator. There is a strong emphasis in the SDG framework on the use of national datasets where possible. Each country has a unique landscape, and a distinctive interpretation of it. Supporting countries to develop National scale products from the global datasets, or to create their own products using image data and field assessment methods, is a strong focus on the Initiative. There are many interpretations of each of sub-indicators of SDG 15.3.1 available at local, national or global scales, and these may be formulated or interpreted differently, or be based on different base datasets. This creates differences in the representation of the sub-indicators, which ultimately leads to inconsistencies in the extent of degraded land reported using these different datasets. Some of the factors that lead to this situation will be dealt with in WG2 on Data Quality Standards and WG3 on Data Analytics. The science that underpins the sub-indicator analyses will continue to evolve and improve,

however, and balancing the consistency and accuracy of the analyses will be an ongoing challenge. The main technical challenges are to identify the best open source methods to create new data analytics tools, and the best place to house and support them on the web. The range of languages and coding standards, and the number of repositories of data like that needed to assess LDN is very large and growing rapidly. Within the context of this highly dynamic environment, identifying the best environment in which to develop new analytical tools and methods, or the best location to deploy or house the tools can be challenging. Tools developed in WG3 will abide by GEO Data Sharing Principles as well as FAIR and Open EO data principles which should maximize the compatibility of these tools now and into the future. One of the early proposed tasks of WG3 is to conduct a review of existing SDG data repositories and analytics hubs to identify the most effective location to house and support data sets and analytical tools in future. The lack of global, fine spatial resolution time series datasets representing land cover and productivity back to the year 2000 is a significant challenge that complicates the monitoring of change in conditions between the baseline and monitoring periods (from the perspective of SDG Indicator 15.3.1). WG3 may support geospatial analytics research to produce a simulated dataset, generated from a combination of high frequency coarse spatial resolution, and lower frequency higher resolution data, that may improve comparisons against the baseline. Datasets similar to this are already being produced by blending Landsat and Sentinel image data, but they do not extend back in time to 2000. Blending of MODIS and Landsat data may be able to produce an NPP data at the appropriate scale, frequency and resolution. (This project has been discussed with CEOS) Land cover datasets do not currently provide consistent data from the baseline period to the current period. It may be possible to model the best available global land cover products using Landsat imagery and other datasets, and generate an historical land cover/land use dataset at Landsat Resolution back to the year 2000. (This project has been discussed with CEOS) There is a need to create and validate a dataset representing carbon stocks above and below ground. Currently the Carbon Stocks sub-indicator of SDG indicator 15.3.1 uses Soil Organic Carbon as a surrogate. While this is useful, it does not fully meet the needs of the sub-indicator. This would require a significant coordinate effort by specialist EO modellers, which may be supported in part from the GEO-LDN Initiative.

Does the Initiative expect to complete any key new outputs, improvements to existing outputs, or improvements to the methods of producing outputs, in the 2023-2025 period?

Yes

Please describe these new outputs or improvements.

See above for EO datasets to support improved calculation of SDG Indicator 15.3.1. See output table above. There is also a need to identify the best datasets for use in specific geographies – small islands and mountainous regions in particular. WG3 will engage a consultant organization to work through the data quality decision trees included in the GPG v2 from the perspective of these geographies and identify the most appropriate datasets and their trade-offs, and provide this review as a report to be hosted through the GEO-LDN website (This project has been discussed with CEOS)

Please identify the key tasks that must be implemented to ensure delivery of these changes, with target dates for completion.

Task	Task description	Expected completion (month/year)
Decision tree review	small islands and mountainous regions	12/2023
Other datasets	workplan to be discussed with CEOS and Open Earth Alliance	12/2025

Resources

Have all resources required to implement the Initiative's planned work in the 2023-2025

period been secured?

Please list all financial and non-financial contributions to the Initiative (other than in-kind, voluntary participation by individual contributors) having a value of more than USD 50,000.

Contributing Organization	GEO Status	Type of Resource	Value	Currency
German Federal Ministry for Economic Cooperation and Development via GIZ	Germany	Financial	6.2 Million	Euros

Lessons from the 2020-2022 Period

Were all planned activities for the 2020-2022 period implemented as expected?

Yes

Were there any key challenges faced by the Initiative in the 2020-2022 period?

Yes

Please describe.

The steering group has worked on a best-efforts basis. The time available to work on the Initiative has become increasingly challenging. Given the busy schedules of all the co-leads, and the very limited funding in 2019-2021, the GEO-LDN Initiative is very proud of its commitment and achievements so far.

The UNCCD COP has provided the mandate for GEO-LDN and calls developed country Parties, other Parties in a position to do so, international financial organizations, civil society organizations and private sector institutions to consider contributing, financially or in-kind to the Group on Earth Observations Land Degradation Neutrality Initiative. However, so far Germany is the only country Party that has contributed financially to the GEO-LDN Initiative. A diversification of funding sources is necessary in order to ensure the sustainability of the GEO-LDN Initiative beyond 2026.

Were there any impacts or changes to operations due to COVID-19?

Yes

Please describe.

Key events were carried out virtually, e.g. the consultation workshops on minimum data quality standards, which were originally planned to happen in Washington DC in spring 2020, and the GEO-LDN innovation competition including the Award Ceremony at UNCCD's CRIC19 session.

Please describe the key changes proposed for the 2023-2025 period, for example, new projects, new areas of focus, or adjustments to the activity governance.

With the GIZ global project "Geodata for development – supporting the GEO-LDN Initiative" (D4D4LDN) funded by the German Federal Ministry of Economic Cooperation and Development (BMZ), a GEO-LDN Secretariat will be established with a team leader and three advisors for Capacity Development, Geoinformation, and Stakeholder Engagement, all funded until October 2026. The secretariat - embedded in the governance structure of the Group on Earth Observations - will perform coordination, networking and outreach functions for the GEO-LDN Initiative. It will increase the Initiative's efficiency, networking and visibility. The support project comes with

clear objectives, milestones, and deliverables.

Does the Initiative have outputs (products, services, etc.) available to users now, even if only on a pilot or testing basis?

Yes

Please provide any available information describing this usage (for example, user statistics, results of user testing) and/or feedback from users (for example, user comments, evaluations).

C.I.'s trends.earth is openly available and being used by UNCCD country parties for reporting on SDG 15.3.1 (<https://trends.earth/docs/en/>). It is becoming available as a knowledge package on the GEO Knowledge Hub. The Land Use Planning for Land Degradation Neutrality (LUP4LDN) tool developed by SCiO in a co-design process with stakeholders from Tunisia and Burkina Faso is available as a prototype and first operational version (<https://www.geo-ldn.org/winner>). Decision trees on data quality standards are finalized and published in a technical paper (https://earthobservations.org/documents/ldn/20200703_GEOOLDN_TechnicalNote_FINAL_SINGLE.pdf), integrated into UNCCD's Good Practice Guidance (https://www.unccd.int/sites/default/files/documents/2021-09/UNCCD_GPG_SDG-Indicator-15.3.1_version2_2021.pdf), and integrated into trends.earth. An international post-graduate programme on LDN is being developed with a first version of curricula available, and will be hosted at the University of Energy and Natural Resources in Ghana (<https://uenr.edu.gh/uenr-engages-stakeholders-on-proposed-curriculum-on-land-degradation-neutrality/>).

Please provide supporting documentation if available.

- no supporting documents provided -

Do you have evidence of any impacts that have occurred in part as a result of using the outputs of the Initiative (for example, policy decisions taken, behaviour changes by users, risks mitigated)?

Yes

Please provide examples, with evidence where available.

UNCCD Parties have used the updated UNCCD Good Practice and trends.earth for the national reporting on SDG indicator 15.3.1. Pilot countries such as Tunisia and Burkina Faso have co-designed the LUP4LDN tool and expect it to have significant impact on their land use planning, though it is too early to prove impact of LUP4LDN. A user perspective on LUP4LDN is available as parts of the GEO-LDN voices (https://www.youtube.com/watch?time_continue=5&v=YNDQBEpMUZU&feature=emb_logo). The UNCCD Parties acknowledge with appreciation the important contribution of the Group on Earth Observations Land Degradation Neutrality Initiative to the development of data quality standards, education programmes and practical tools for the planning, implementation, monitoring and reporting of land degradation neutrality. (cf. COP decisions – final document to be uploaded after UNCCD's COP 15)

Please provide supporting documentation if available.

- no supporting documents provided -

Have there been any internal or external reviews or evaluations of the Initiative since 2019?

No

Please indicate any GEO Work Programme activities with which you have ongoing collaboration.

- AFRIGEO - African Group on Earth Observations
- EO4SDG - Earth Observations for the Sustainable Development Goals

- GEO BON - GEO Biodiversity Observation Network
- GEOGLAM - GEO Global Agricultural Monitoring
- GEOSS Infrastructure Development - GEOSS Infrastructure Development
- GFOI - Global Forest Observation Initiative

Please indicate any additional GEO Work Programme activities with which you would like to establish new collaborations.

- GEO-EV - GEO Essential Variables
- GEOSS Data, Information and Knowledge Resources - GEOSS Data, Information and Knowledge Resources
- LAND-COVER - Global Land Cover

Stakeholder Engagement and Capacity Building

Are there specific countries or organizations that your Initiative would like to engage?

Yes

Please list these countries, regions or organizations.

The GEO-LDN Initiative has a global mandate from the UNCCD Parties and has worked with selected countries such as Tunisia and Burkina Faso to co-design its outputs.

The “end-user community” in the GEO-LDN Initiative consists of national governments, relevant line ministries (the main reporting entity for SDG indicator 15.3.1) and their National Statistical Offices that have responsibility for SDG reporting, and any sub-national entities or specialized agencies that are validating and reporting data for the UNCCD and SDG reporting processes. For the implementation-part of LDN, the “end-user-community” consists of land use planners at the national and sub-national level. Advice and expert input from private sector, academia and civil society will also inform progress and priorities.

What are your plans to engage them?

The GEO-LDN Secretariat will employ a stakeholder engagement and communication advisor as well as a capacity development advisor. A stakeholder engagement strategy and a capacity development strategy will specify the plans to engage specific countries, organizations and other stakeholders. For the second half of 2022, GEO-LDN is preparing a workshop series together with ELD, WOCAT, FAO and UNCCD on Scenarios for Integrated Land Use Planning (S4ILUP: <https://fdta.eld-initiative.org/index.html>) with the aim to address current challenges which hinder the effectiveness of integrated land use planning and to identify entry points which can guide participatory ILUP processes. Following the workshop series, a global network of land use planning experts will be maintained and moderated for at least 4 more years by the GEO-LDN Initiative, supporting global exchange in this field that is high on political agendas.

The GEO-LDN Initiative also builds upon the national working groups established in the framework of the LDN TSP in 122 countries and, from there mobilizes and strengthens the engagement of other countries. The GEO-LDN Initiative will include actions, including active recruitment of academic, R&D partners and institutions to provide expert input. The value of general Earth science research, data and data analytic techniques will be exploited in ways to both help national governments meet their sustainable development objectives and to demonstrate the translation of R&D into policy and ground-level applications.

The GEO-LDN Initiative will assist with the rapid provision and deployment of EO datasets and promote in-country analysis and interpretation of those data sets, thereby ensuring national ownership. The Initiative will leverage the UNCCD reporting mechanism and tools, which provide a practical and harmonized approach to monitoring and reporting that began beginning in 2018 and every four years thereafter.

Does your Initiative engage users in the work of the Initiative (for example, consultation, testing, co-design)?

Yes

Please briefly describe the Initiative’s approach to engaging users.

Data, information, guidance, tools, platforms and trainings developed by the GEO-LDN Initiative will be tailored to meet the needs of decision-makers for monitoring progress towards a number of global/regional targets and developing initiatives to halt and reverse land degradation and restore degraded land.

The minimum data quality standards and decision trees for SDG Indicator 15.3.1 were the outputs of a GEO-LDN consultative process which in 2020 involved over 30 data providers/experts and 100 data users. The consultation process was formative, purposive and inclusive. This means that it was stepwise where each stage built on the step before it, that each step started by approaching those with rich knowledge and a history of past engagement, and that the entire process was open and invited comments and interaction.

The international technology innovation competition organized by the GEO-LDN Initiative in 2020-2021 used a human-centered design approach. Human-centered design is a user-centred innovation method which follows a structured creativity process in order to find innovative solutions for complex challenges. It involves the user in an early stage of the design process by conducting interviews, testing the rough idea right from the beginning or doing co-creation sessions with the users. Teams participating in the GEO-LDN Competition had to show engagement of potential users-groups, in particular land use planners, to fulfill the competition's rules. Each team included at least one user. Additionally, the teams had the opportunity to participate in a feedback-session to test their prototypes with a larger group of potential end-users.

Does the Initiative have a user engagement strategy or similar kind of document?

No

Are there categories of users that are not represented at this time, but you would like to engage?

Yes

Please list these user categories or regions.

land use planners (are represented but not yet enough)

What are the plans for further engagement of users in the Initiative?

Cf. above (S4ILUP workshop series, establishment and maintenance of a network of land use planners, organization of yearly dialogue forums, recruitment of a stakeholder engagement advisor) and in addition outreach through a side event at the UNCCD COP15

Does the Initiative have a documented capacity development strategy?

No

Please describe the approach to capacity development that is being implemented by the Initiative?

The main elements of the capacity development approach are the development of curricula and accreditation of a postgraduate programme on LDN for Master and PhD students, a scholarship programme, virtual training opportunities such as Massive Open Online Courses (MOOCs), and dialogue forums for knowledge exchange. The CD advisor will support the implementation of WG1 activities including the development of a CD strategy.

Are there any commercial sector organizations participating in this Initiative?

Yes

Please list the commercial sector organizations.

Organization name	GEO Member/PO/...	Country in which the organization is based	City in which the organization is based
SCiO		Greece	Athens

Are there opportunities for commercial sector uptake of the outputs of the Initiative?

No

Are there opportunities for further commercial sector participation in the Initiative?

Yes

Please describe these opportunities.

Potentially in the further development of tools - but need for open source

Does the Initiative have a plan for commercial sector engagement?

No

Governance

Please describe the roles of each of the key leadership positions, as well as any team structures involved in day-to-day management.

The core day-to-day leadership group consists of three Co-chairs, Co-Leads of the three GEO-LDN working groups, the GEO Focal Point at UNCCD, and a GEO Secretariat staff member. This core group meets once a week virtually for coordination and planning activities. For selected funded activities, consultants also join the meetings. The group is characterized by a trusting relationship and a productive working spirit. The group uses a MS Teams room as an archive and for joint work on documents and presentations. The MS Teams chat and emails are the main ways of communication besides the weekly coordination meetings. Since the group is spread around the globe (Africa, Australia, USA, Europe), time differences pose a challenge, especially during the North winter/South summer, with the consequence of working on early mornings and late nights showing the great commitment of the leadership group members.

From mid-2022, a GEO-LDN Secretariat will be in place hosted by GIZ in Bonn, Germany, with a team leader, three advisors, and supporting administrative staff. It will be embedded in the governance structure of GEO and perform coordination, networking and outreach functions for the GEO-LDN Initiative.

Is there a steering committee or other governance bodies that advise the Initiative but are not involved in day-to-day management?

Yes

Please describe the roles of each body. If there are multiple governance bodies, please describe the relationships among them (such as through a governance structure diagram).

The Steering Committee consists of the leadership group plus GEO-LDN principals. It has an advisory function and aims at yearly in-person meetings to guide the creation of updated work plans and overall strategic advice for the Initiative. The last meeting took place 2019 with a welcome of the UNCCD Executive Secretary and - due to COVID - the next meeting will take place in Mai 2020 in Bonn, Germany.

There are three GEO-LDN working groups, WG 1 on Capacity Development, WG2 on Data Quality Standards, and WG 3 on Data Analytics, each led by working group co-lead and one of the GEO-LDN Co-chairs. The Working Groups are the main bodies for implementing activities. Almost all GEO-LDN members are assigned to at least one working group.

Function of the GEO-LDN leads group and new GEO-LDN Secretariat cf. above.

- geo_ldn_governance.jpg ([link](#))

What methods does the Initiative use to communicate with its participants?

- Email / e-newsletters
- Website
- Other

Please describe.

The main way of communication is via email for ad-hoc news and for the distribution of the (still irregular) GEO-LDN newsletter. With the new GEO-LDN Secretariat in place, more regulate updates via newsletter will be provided. Monthly virtual open forums will help to strengthen the exchange among the GEO-LDN members and partners. A website for the GEO-LDN competition was launched (<https://www.geo-ldn.org/background>) to complement the GEO-LDN website hosted by the GEO Secretariat (https://earthobservations.org/geo_ldn.php). Both websites will be merged with a relaunch of the GEO-LDN website. A short movie (4min, <https://www.voices.geo-ldn.org/#/>) was produced accompanied by statements and interviews of the main donor (BMZ), the GEO-LDN Co-Chairs, the UNCCD lead scientist, the GEO Secretariat, and a user from Tunisia. The Initiative organizes side events at relevant international meetings, including GEO Plenaries, UNCCD COP and CRIC, ESA Living Planet, and the UN World Data Forum among others. GEO-LDN members are actively involved in consultation processes (e.g. for the development of data quality standards, cf. above).

Please describe the key risks that could delay or obstruct the completion of the planned activities and outputs of the Initiative, along with any actions taken to mitigate these risks.

Description of the hazard	Description of the possible impacts	Scale of impact	Likelihood of occurrence	Mitigation measures
long term sustainability after the end of the D4D4LDN support project (10/2026)	Less funds and less human resources to support the implementation of the Initiative's activities	Moderate	Possible	The GEO-LDN Secretariat will develop a sustainability strategy to mitigate the risk

What methods are used by the Initiative to monitor its effectiveness?

- User or beneficiary surveys
- Evaluations

Would the Initiative be interested in assistance from the GEO Secretariat for developing an impact plan?

Yes

How are the results of the monitoring and evaluation activities shared with participants and the wider GEO community?

The results of the M&E activities will be shared via the above-mentioned communication channels

Are any monitoring or evaluation activities required by funders/contributors?

Yes

Please describe and provide reports if available.

From 2022/2023: With the D4D4LDN project, more systematic monitoring will be required to report to the donor on specified indicators. This includes surveys of key stakeholders and cooperation partners on the GEO-LDN Initiative's efficiency, networking and visibility as well as examples of application in the national context, and evaluation of communication channels, the usability of the federated system, the sustainability strategy, the documentation of the design and development of the federated system with regard to the involvement of users, defined criteria of the quality review process for new elements of the federated system,

documentation of the training courses with regard to the composition of the participants (gender), the dialogue forums documentation with regard to the composition of participants (countries, sectors, gender) and the feedback of experiences on LDN implementation in the country processes, and the documentation of the accreditation of the postgraduate programme.)

- no supporting documents provided -

Participants

Please list the active individual participants in the Initiative

First name	Last name	Email address	Member	Org
Kristen	Williams	kristen.williams@csiro.au	Australia	CSIRO - Commonwealth Scientific and Industrial Research Organisation
Ivan	Gonzalez	ivan.gonzalez@nau.edu		NAU GEODE Lab - Northern Arizona University Global Earth Observation & Dynamics of Ecosystems Lab
Patrice	Sanou	patrice.sanou@ises.tel.org	ISESTEL - Institut Supérieur d'Etudes Spatiales et Télécommunications	- Centre Universitaire Siget-A
Joost	Teuben	jteuben@geosec.org		
Timothy	Dube	timothydube3@gmail.com	AARSE - African Association of Remote Sensing of the Environment	
Alex	Zvoleff	azvoleff@conservation.org	CI - Conservation International	CI - Conservation International
Sasha	Alexander Juanteguy	salexander@unccd.int	UNCCD - Secretariat of the United Nations Convention to Combat Desertification	UNCCD - Secretariat of the United Nations Convention to Combat Desertification
Barron	Orr	bjorr@unccd.int	UNCCD - Secretariat of the United Nations Convention to Combat Desertification	UNCCD - Secretariat of the United Nations Convention to Combat Desertification
Douglas	Cripe	dcripe@geosec.org		

Luisa	Di Lucchio	di.luisa@gmail.com	Denmark	UCPH - University of Copenhagen
Felicia	Akinyemi	felicia.akinyemi@giub.unibe.ch	Switzerland	
Stefan	Schlingloff	stefan.schlingloff@fao.org	FAO - Food and Agriculture Organization of the United Nations	FAO - Food and Agriculture Organization of the United Nations
Yelena	Finegold	yelena.finegold@fao.org	FAO - Food and Agriculture Organization of the United Nations	FAO - Food and Agriculture Organization of the United Nations
Matieu	Henry	matieu.henry@fao.org	FAO - Food and Agriculture Organization of the United Nations	FAO - Food and Agriculture Organization of the United Nations
Pythagoras	Karampiperis	pythagoras@scio.systems		
Panagiotis	Zervas	panagiotis@scio.systems		
Enrico	Bonaiuti	e.bonaiuti@cgiar.org		
Quang	Le	q.le@cgiar.org		
Claudio	Zucca	clzucca@uniss.it	Italy	UNISS - University of Sassari
Tatenda	Lemann	tatenda.lemann@unibe.ch	Switzerland	
Richard	Thomas	drrjthomas@gmail.com		ELD - Economics of Land Degradation
Eva	Ivits	eva.ivits-wasser@eea.europa.eu	EEA - European Environment Agency	EEA - European Environment Agency
Abel	Ramoelo	abel.ramoelo@sanparks.org	South Africa	CSIR - Council for Scientific and Industrial Research
Quirico	Migheli	qmigheli@uniss.it	Italy	
Flávia	de Souza Mendes	flaviamendesgeo@gmail.com		RSS GmbH - Remote Sensing Solutions GmbH
Amos	Kabo-Bah	amos.kabobah@uennr.edu.gh	Ghana	UENR, Sunyani, Ghana - University of Energy and Natural Resources, Sunyani, Ghana
Antje	Hecheltjen	antje.hecheltjen@gi	Germany	GIZ - German

		z.de		International Development Agency
Neil	Sims	neil.sims@csiro.au	Australia	CSIRO - Commonwealth Scientific and Industrial Research Organisation
Sara	Minelli	sminelli@unccd.int	UNCCD - Secretariat of the United Nations Convention to Combat Desertification	UNCCD - Secretariat of the United Nations Convention to Combat Desertification
Alastair	Graham	a.graham@geoger.co.uk	United Kingdom	
Anthony	Whitbread	a.whitbread@cgiar.org	Germany	
Adam	Lewis	adam.lewis@digital earthafrica.org	Australia	DE Africa - Digital Earth Africa
Adrian	Strauch	adrian.strauch@uni-bonn.de	Germany	- University of Bonn
Alan	Belward	alan.belward@ec.europa.eu	European Commission	JRC - Joint Research Center
Amadou	Dieye	dieye@cse.sn	Senegal	CSE - Centre de Suivi Ecologique
Andiswa	Mlisa	amlisa@sansa.org.za	South Africa	SANSA - South African National Space Agency
Andreas	Brink	andreas.brink@ec.europa.eu	European Commission	
Andreia	Siquiera	andreia.sequiera@ga.gov.au		
Andrew	Kruczkiewicz	andrewk@iri.columbia.edu	United States	Columbia University - Columbia University
Antonio	Araújo	antonio.araujo@gmv.com	Spain	
Argyro	Kavvada	argyro.kavvada@nasa.gov	United States	NASA - National Aeronautics and Space Administration
Bulelwa	Semoli	bulelwa.semoli@drdlr.gov.za	South Africa	DRDLR - Department of Rural Development and Land Reform

Jillian	Campbell	campbell7@un.org	Kenya	
Carsten	Dettmann	carsten.dettmann@ bmvi.bund.de	Germany	
Jun	Chen	chenjun@ngcc.cn	China	NGCC - National Geomatics Center of China
Helmut	Staudenrausch	helmut.staudenrausch@ dlr.de	Germany	
Damas	Poda	damas.poda@fao.org	FAO - Food and Agriculture Organization of the United Nations	
Douglas	Muchoney	douglas.muchoney@ fao.org	FAO - Food and Agriculture Organization of the United Nations	FAO - Food and Agriculture Organization of the United Nations
Adama	Doulikom	doulikom.adama@yahoo.fr	Burkina Faso	
Elise	van Tilborg	e.vantilborg@space office.nl	Netherlands	
Ece	Aksoy	ece.aksoy@fao.org	FAO - Food and Agriculture Organization of the United Nations	
Fabian	Löw	fabian.loew@bbk.bund.de	Germany	- Federal Office for Civil Protection and Disaster Assistance
Gilberto	Camara	gilberto.camara.inpe@gmail.com	Brazil	
Mariasilvia	Giamberini	giamberini@igg.cnr.it	Italy	CNR - National Research Council, Italy
Gregory	Giuliani	gregory.giuliani@unige.ch	Switzerland	University of Geneva - University of Geneva
Hendrik	Baeyens	hbaeyens@geosec.org		
Alfari	Issifou	i.alfari@agrhyment.net		
Issifou	Alfari	issifoualfari14@gmail.com		
Mónica	Miguel-Lago	monica.miguel-lago@ears.org	EARSC - European Association of Remote Sensing Companies	EARSC - European Association of Remote Sensing Companies

Nataliia	Kussul	nataliia.kussul@gmail.com	Ukraine	SRI NASU-SSAU - Space Research Institute of the National Academy of Sciences of Ukraine and National Space Agency of Ukraine
Imraan	Saloojee	isaloojee@sansa.org.za		
Chu-Ishida	Watanabe	ishida.chu@jaxa.jp		
Jan	de Leeuw	jan.deleeuw@wur.nl	Netherlands	
Jose Eduardo	De La Torre Barcena	jetb@nyu.edu	Mexico	
Joachim	Post	joachim.post@dlr.de	Germany	
Joan	Masó-Pau	joan.maso@uab.cat	Spain	CREAF - Centre for Ecological Research and Forestry Applications
Jonathon	Ross	jonathon.ross@gov.au	Australia	
Jenna	Slotin	jslotin@data4sdgs.org	United States	
Kerry	Sawyer	kerry.sawyer@noaa.gov	CEOS - Committee on Earth Observation Satellites	NOAA - National Oceanic and Atmospheric Administration
Laetitia	Navarro	laetitia.navarro@idiv.de	Germany	iDiv - German Center for Integrative Biodiversity Research Halle-Jena-Leipzig
Xiaosong	Li	lixs@radi.ac.cn	China	
Laven	Naidoo	luncedo.ngcofe@drdlr.gov.za	South Africa	
Marc	Paganini	marc.paganini@esa.int	ESA - European Space Agency	ESA - European Space Agency
Martin	Herold	martin.herold@wur.nl	Netherlands	- Wageningen University
Marcelina	Borejko	mborejko@eversis.com	Poland	
Mariano	Gonzalez-Roglich	mgonzalez-roglich	CI - Conservation	

		@conservation.org	International	
Michael	Cherlet	michael.cherlet@ec.europa.eu	European Commission	
Mahlatse	Kganyago	mkganyago@sansa.org.za	South Africa	
Nosiseko	Mashiya	nmashiya@sansa.org.za	South Africa	SANSA - South African National Space Agency
Nuno	Grosso	nuno.grosso@deimos.com.pt	EARSC - European Association of Remote Sensing Companies	
Osamu	Ochiai	ochiai.osamu@jaxa.jp	Japan	JAXA - Japan Aerospace Exploration Agency
Omar	Seidu	omar.seidu@statsghana.gov.gh	Ghana	
Palma	Blonda	palma.blonda@iia.cnr.it	Italy	
Petteri	Vihervaara	petteri.vihervaara@ymparisto.fi	Finland	FMI - Finnish Meteorological Institute
Ruud	Grim	r.grim@spaceoffice.nl	Netherlands	
Richard	Tswai	richard@arc.agric.za	South Africa	
Rik	van den Bosch	rik.vandenbosch@wur.nl	Netherlands	
Richard	Lucas	rml2@aber.ac.uk	United Kingdom	- Aberystwyth University
Ronald	Vargas	ronald.vargas@fao.org	FAO - Food and Agriculture Organization of the United Nations	
Satya	Kalluri	satya.kalluri@noaa.gov	United States	
Gregory	Scott	scott12@un.org	United States	
Shanna	McClain	shanna.n.mcclain@nasa.gov	United States	NASA - National Aeronautics and Space Administration
Thomas	Hammond	thomas.hammond@fao.org	FAO - Food and Agriculture Organization of the United Nations	

Trevor	Dhu	trevor.dhu@ga.gov.au	Australia	GA - Geoscience Australia
Timothy	Stryker	tstryker@usgs.gov		
Timothy Max	Wright	twright@conservation.org	CI - Conservation International	CI - Conservation International
Ursula	Gessner	ursula.gessner@dlr.de	Germany	
Uta	Heiden	uta.heiden@dlr.de	Germany	
Valerie	Graw	valerie.graw@uni-bonn.de	Germany	
Vincent	Pircher	vincent.pircher@orange.fr	France	

Other information

Please provide any other comments or information that was not included in the previous sections, but you would like to appear in the Implementation Plan.

The GEO-LDN members in the previous section did not update after having filled out the table. I am therefore attaching the list here.

- geo_ldn_members.docx ([link](#))

Co-Editor Management

List of co-editors for this initiative

First name	Last name	Email address
Sara	Minelli	sminelli@unccd.int
Jonas	Hansohm	jonas.hansohm@giz.de
Laurent	Durieux	ldurieux@geosec.org