

Advances in soil health monitoring for food and nutrition security, climate change action, biodiversity and ecosystem restoration

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CPCN
2 Nov 2022



UNITED NATIONS DECADE ON
**ECOSYSTEM
RESTORATION**
2021-2030



Key messages

- Landscapes are diverse – we need methods that assess this variability
- We have the tools and methods to measure and track soil health, as well as the underlying processes of land degradation
 - Combining systematic monitoring and citizen science
 - Soil spectroscopy and remote sensing
- We can now monitor at scales relevant to multiple stakeholders:
 - 1) farm scale 2) national scale 3) globally
- Robust monitoring that is accessible can prioritize and track investments
- Multi-stakeholder action to catalyze investments in soil health



>25% of the Earth's surface is degraded, impacting 3.2 billion people (GLO2, 2022, IPBES, 2018)

Soil erosion is the most widespread form of degradation

Photo credit Joakim Vågen

Soil functions

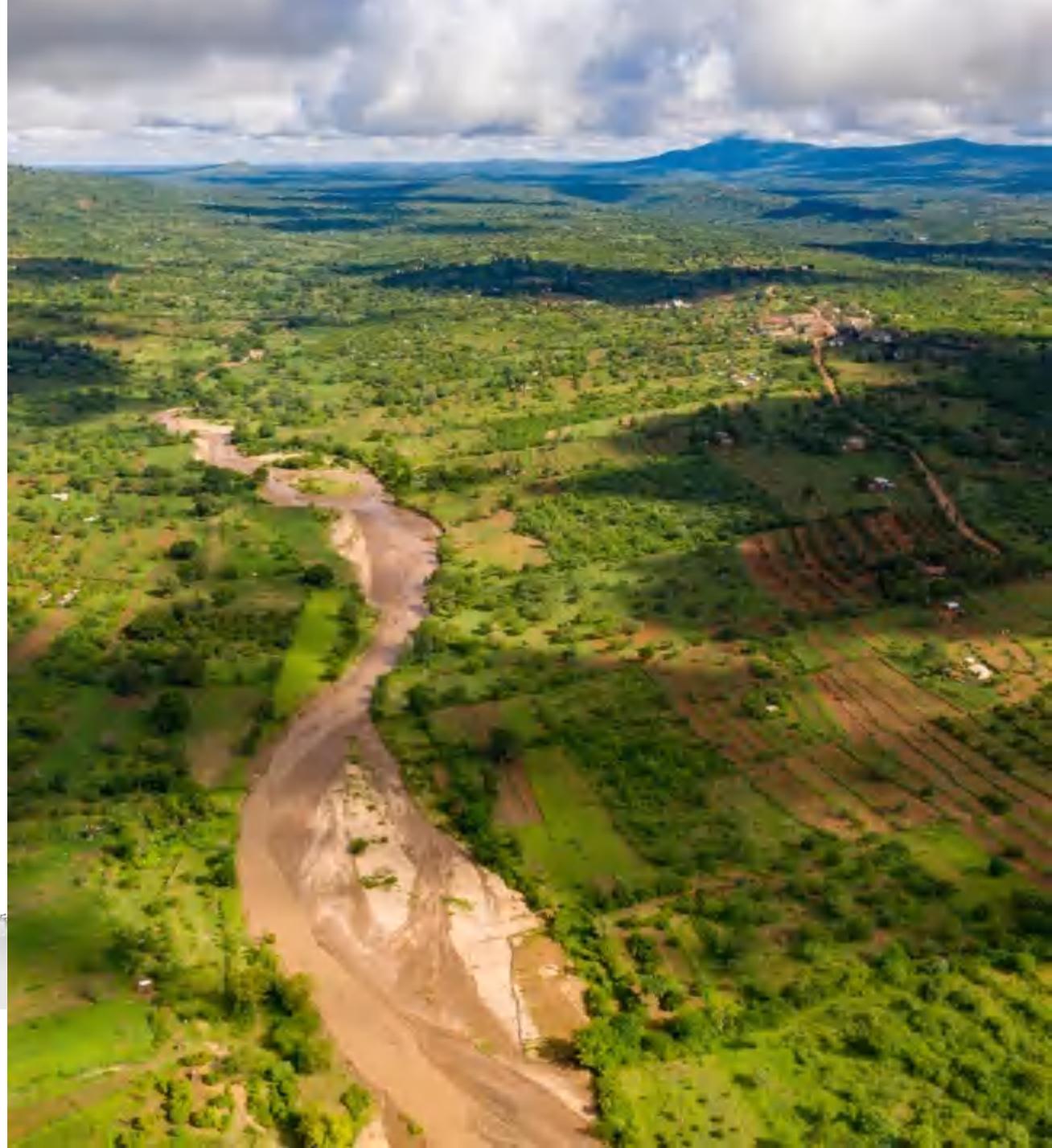
Soils deliver ecosystem services that enable life on Earth

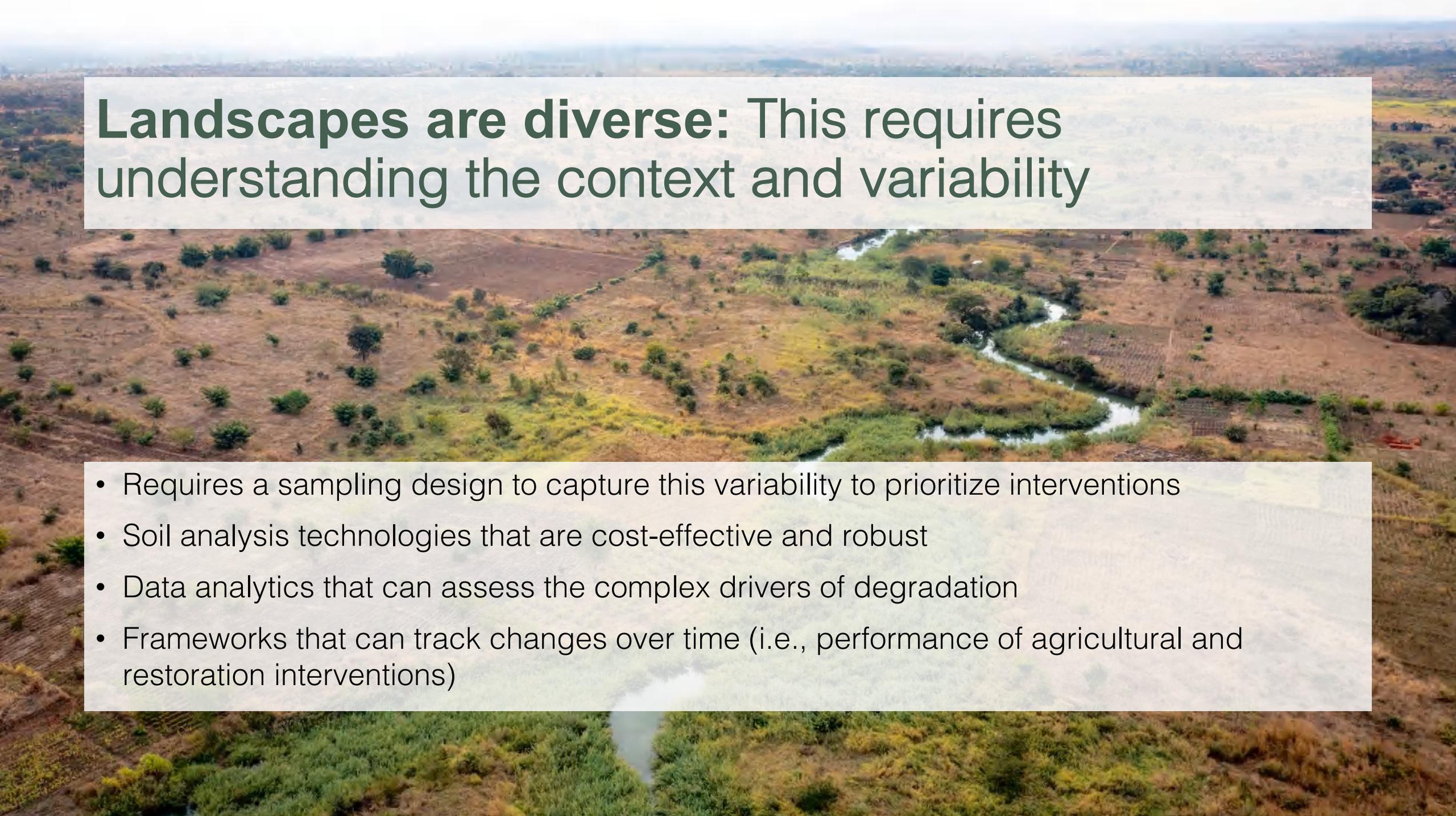


Healthy soil provides multiple ecosystem services & functions

Targeted investments in soil health are urgently needed

- To reverse and prevent land and soil degradation
- To provide nutritious food
- To contribute to climate change mitigation with soil carbon sequestration
- To realize the Sustainable Development Goals (SDGs)
- To reach ecosystem restoration targets



An aerial photograph of a diverse landscape. A winding river flows through the center, surrounded by lush green vegetation. The surrounding land is a mix of brown, dry earth and patches of green grass and small trees. In the background, there are rolling hills and a distant town or city under a hazy sky.

Landscapes are diverse: This requires understanding the context and variability

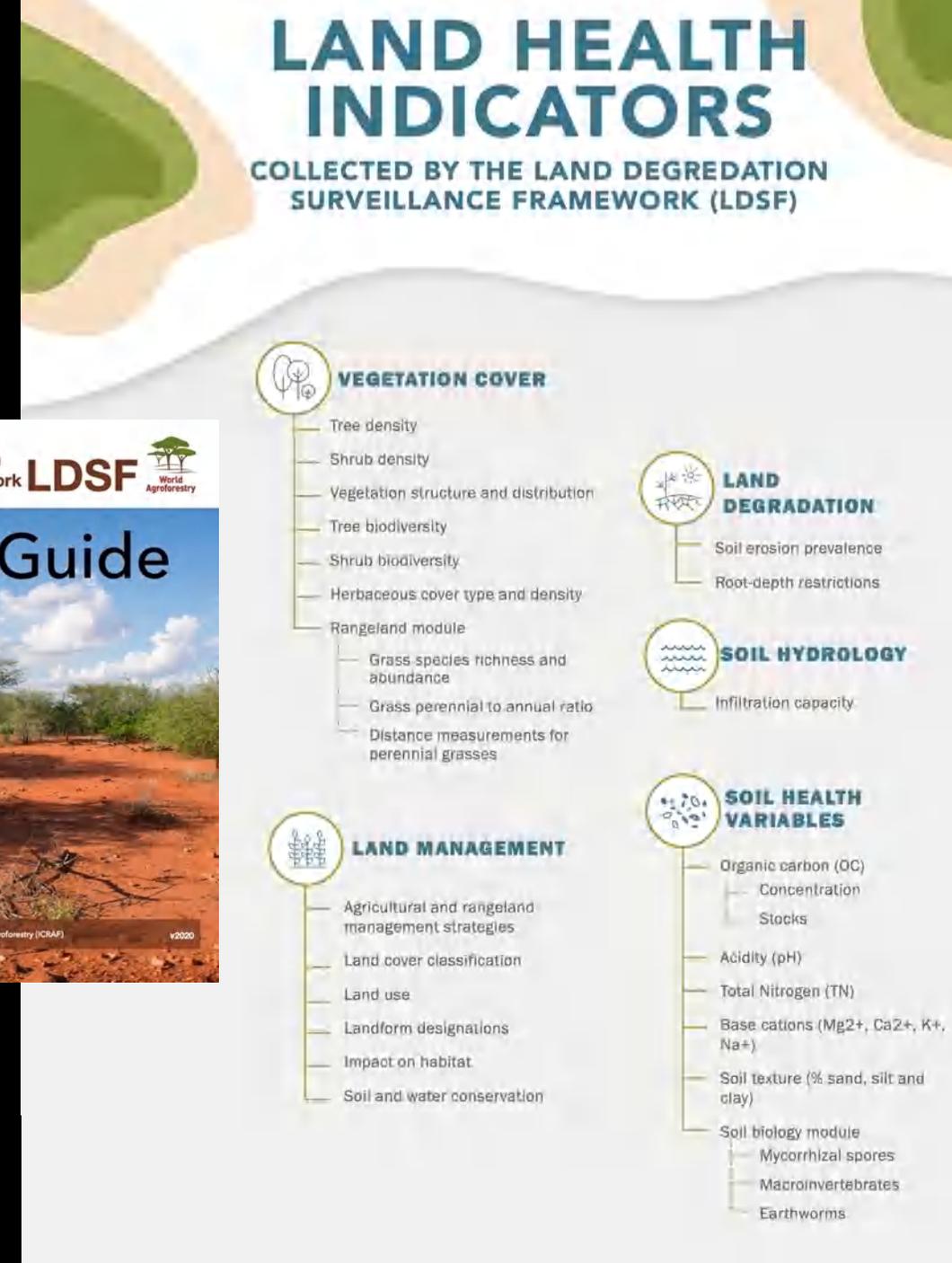
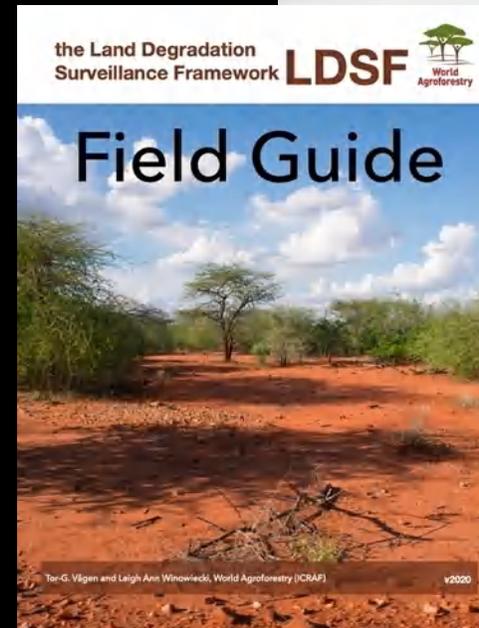
- Requires a sampling design to capture this variability to prioritize interventions
- Soil analysis technologies that are cost-effective and robust
- Data analytics that can assess the complex drivers of degradation
- Frameworks that can track changes over time (i.e., performance of agricultural and restoration interventions)

The LDSF was developed in response to the need for...

Systematic and science-based assessment and monitoring of soil and ecosystem health at scale, using a robust and consistent indicator framework to:

- Assess of variability of and conduct a rapid assessment of multiple variables across landscapes
- Conduct robust statistical analysis on drivers of degradation and relationship between variables
- Produce high quality maps of key indicators
- Set a baseline that can be used to monitor changes over time

<http://landscapeportal.org/blog/2015/03/25/the-land-degradation-surveillance-framework-ldsf/>



Consistent, robust and rapid monitoring systems across diverse ecosystems The Land Degradation Surveillance Framework (LDSF)

<http://landscapeportal.org/blog/2015/03/25/the-land-degradation-surveillance-framework-ldsf/>

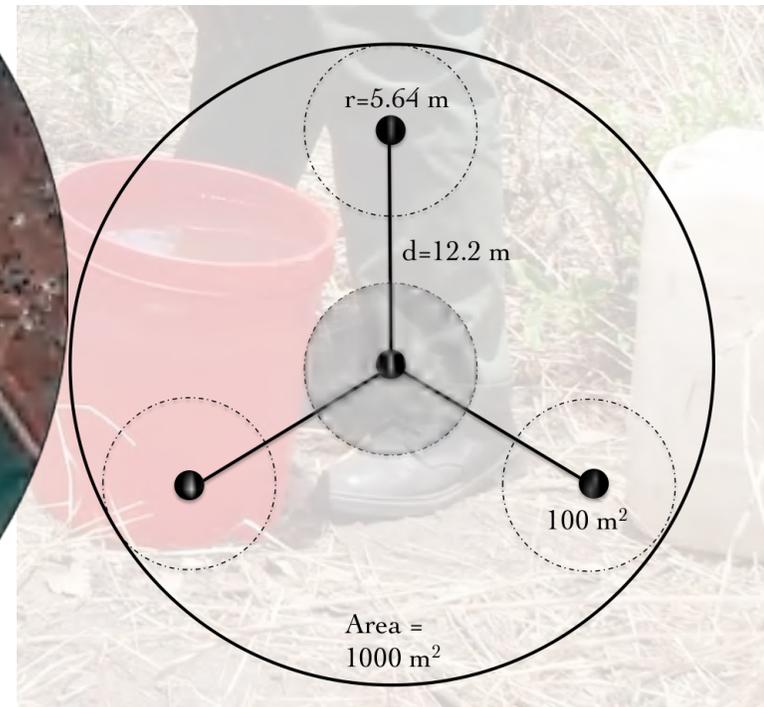
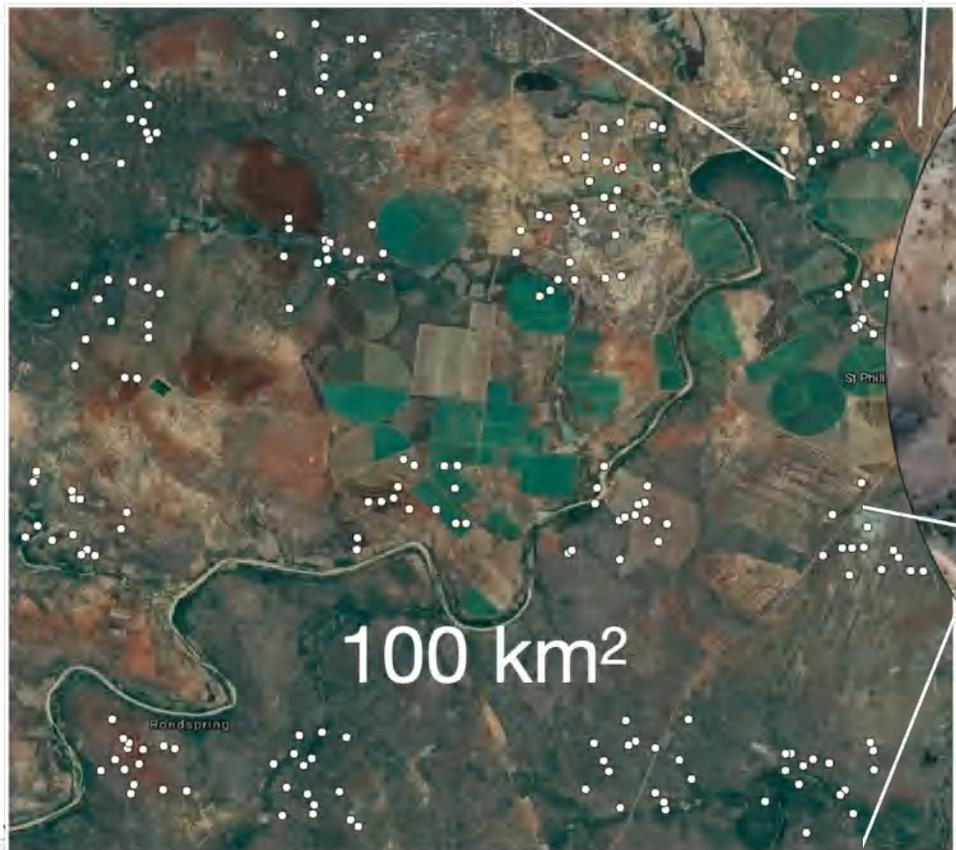


Data-driven network of LDSF sites (each site is 100 km², with 160 sampling plots). One systematic framework across multiple projects, donors, initiatives.



LDSF: Nested Sampling Scales

Unbiased sampling



Site Level (10km * 10km)

Cluster Level
16-1km² per site

Plot Level
10-1000m² per cluster



Soil organic carbon (SOC) is a key indicator of soil health

- It influences many key processes such as water holding capacity of the soil, overall soil fertility, and it also influences land (and agricultural) productivity.
- In addition, **it responds to management**. For example, poor agricultural management can decrease organic carbon in the soil, while regenerative ag practices can increase SOC.
- It is quantifiable and rapid to measure (and we can map it spatially).
- It is not the only indicator, and hence monitoring frameworks must assess multiple indicators simultaneously.



Indicators measured with the LDSF

Soil health variables

- Organic carbon (OC)
 - Concentrations
 - Stocks
- Acidity (pH)
- Total Nitrogen (TN)
- Base cations (Mg^{2+} , Ca^{2+} , K^+ , Na^+)
- Soil texture (% sand, silt and clay)
- Soil biological indicators
 - Mycorrhizal spores
 - Bacteria: fungi

Land Management

- Agricultural practices
- Land cover classification
- Land use (history)
- Landform designations
- Impact on habitat
- Soil and water conservation measures

Land degradation

- Soil erosion prevalence
- Root-depth restrictions

Soil Hydrology

- Infiltration capacity
 - Saturated hydraulic conductivity

Vegetation Assessments

- Tree density
- Shrub density
- Vegetation structure
- Vegetation distribution
- Tree biodiversity
- Shrub biodiversity
- Herbaceous cover
- Rangeland Health
 - Grass & forb biodiversity
 - Herbaceous cover

Collecting Soil Samples in the LDSF

- Soil samples are collected in the field
- Soil samples are taken from each subplot (n=4) and composited at the plot level at two depths
 - 160 topsoil (0-20 cm) samples per site
 - 160 subsoil (20-50 cm) samples per site
- All soil samples are analyzed using mid-infrared spectroscopy – which enables landscape scale analysis
- Reference soil samples are analyzed using traditional wet chemistry (pH, organic carbon, total nitrogen, base cations, etc)
- Predictions are made using the spectra
- Soil cumulative mass samples (0-20,20-50,50-80,80-110 cm) for carbon stock calculations



Shining a light on soils for land restoration

- MIR & NIR spectroscopy for accurate, robust, low-cost analysis of multiple properties, simultaneously
- Can be used to analyze plants, compost, manure, fertilizers, liquids and yes soil!
- Enables landscape scale sampling- which was previously limited by costs of analysis
- This has transformed research and **requires NEW skills of soil scientists**
- ICRAF has invested >20 yrs to build a consistent spectral library (database) for a **number of spectrometers**
- Investment in spectral data analytics

<https://wle.cgiar.org/solutions-and-tools/science-driven-solutions/shining-a-light-on-soils-for-land-restoration/>



Elvis Weullow of the ICRAF Soil and Plant Spectroscopy Lab demonstrating how to use the Spectrometer. Photo: World Agroforestry/Ann Wavinya



MIR Spectroscopy is Accurate, Robust and Cost-efficient



Table 1. Summary of soil properties and model results for the for the mid-Infrared spectroscopy predictions.

Soil property	Range measured (range predicted)	R^2	RMSEP†
Soil organic C (g kg ⁻¹)	1.75–30.31 (2.41–28.10)	0.98	1.3
pH	5.32–8.28 (5.52–8.07)	0.95	0.2
Sand (%)	6.4–78.3 (9.2–72.7)	0.94	5.0
Clay (%)	12.6–76.8 (15.6–74.2)	0.97	3.6

† RMSEP, root mean squared errors of prediction.

Vågen, T., L. A. Winowiecki, W. Twine, and K. Vaughan. 2018. Spatial Gradients of Ecosystem Health Indicators across a Human-Impacted Semiarid Savanna. *J. Environ. Qual* doi:10.2134/jeq2017.07.0300

<https://dl.sciencesocieties.org/publications/jeq/articles/0/0/jeq2017.07.0300>

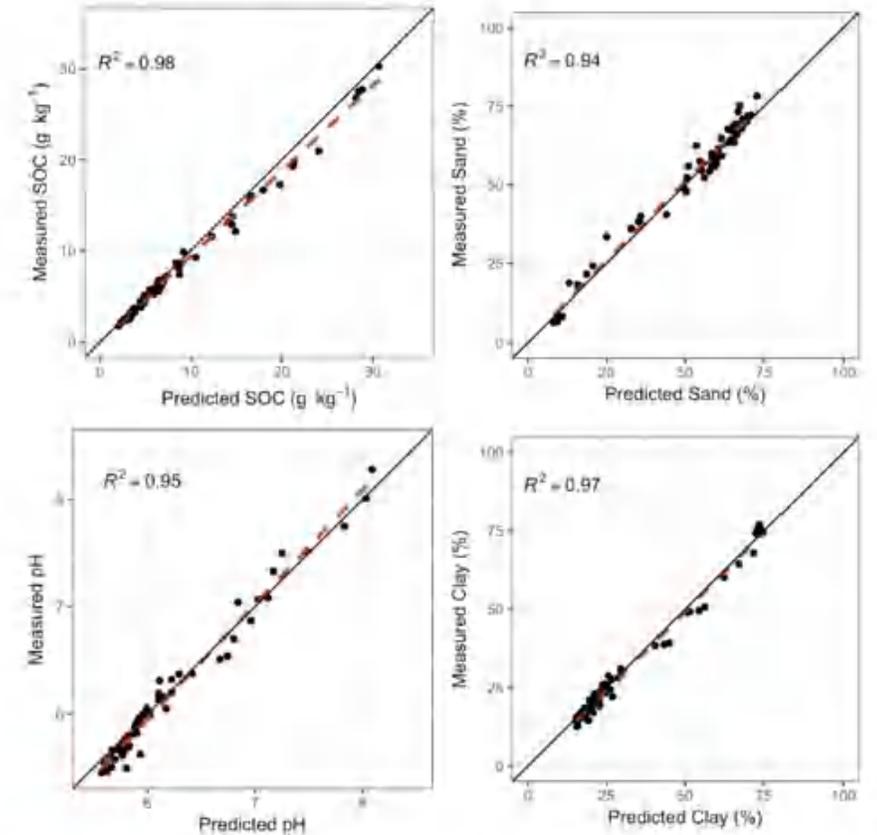


Fig. 3. Prediction results for soil organic carbon (SOC), pH, and texture according to mid-infrared spectral data from the two study sites combined. The red dashed lines represent the regression lines, and the 1:1 abline is the solid black line.

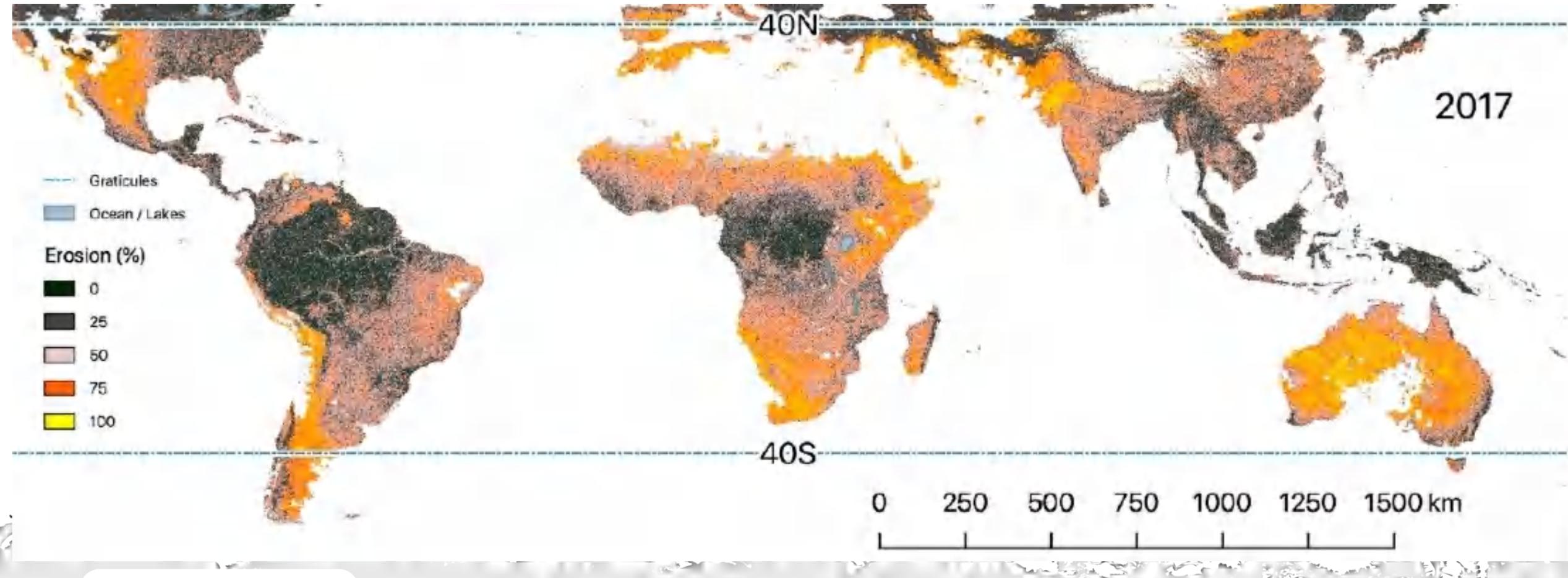
- Visit our webpage to learn more about what we are doing: <https://www.cifor-icraf.org/research/theme/soil-and-land-health/>



An aerial photograph of a rural agricultural landscape. The foreground shows a terraced field with rows of young green plants, likely corn, growing in brown soil. A man in a light blue shirt and grey pants is walking through the field, tending to the plants. In the middle ground, there is a small, single-story brick house with a corrugated metal roof, surrounded by lush green trees and vegetation. The background features rolling green hills and distant mountains under a blue sky with scattered white clouds.

Applications of the LDSF

Soil erosion is a key indicator of land degradation



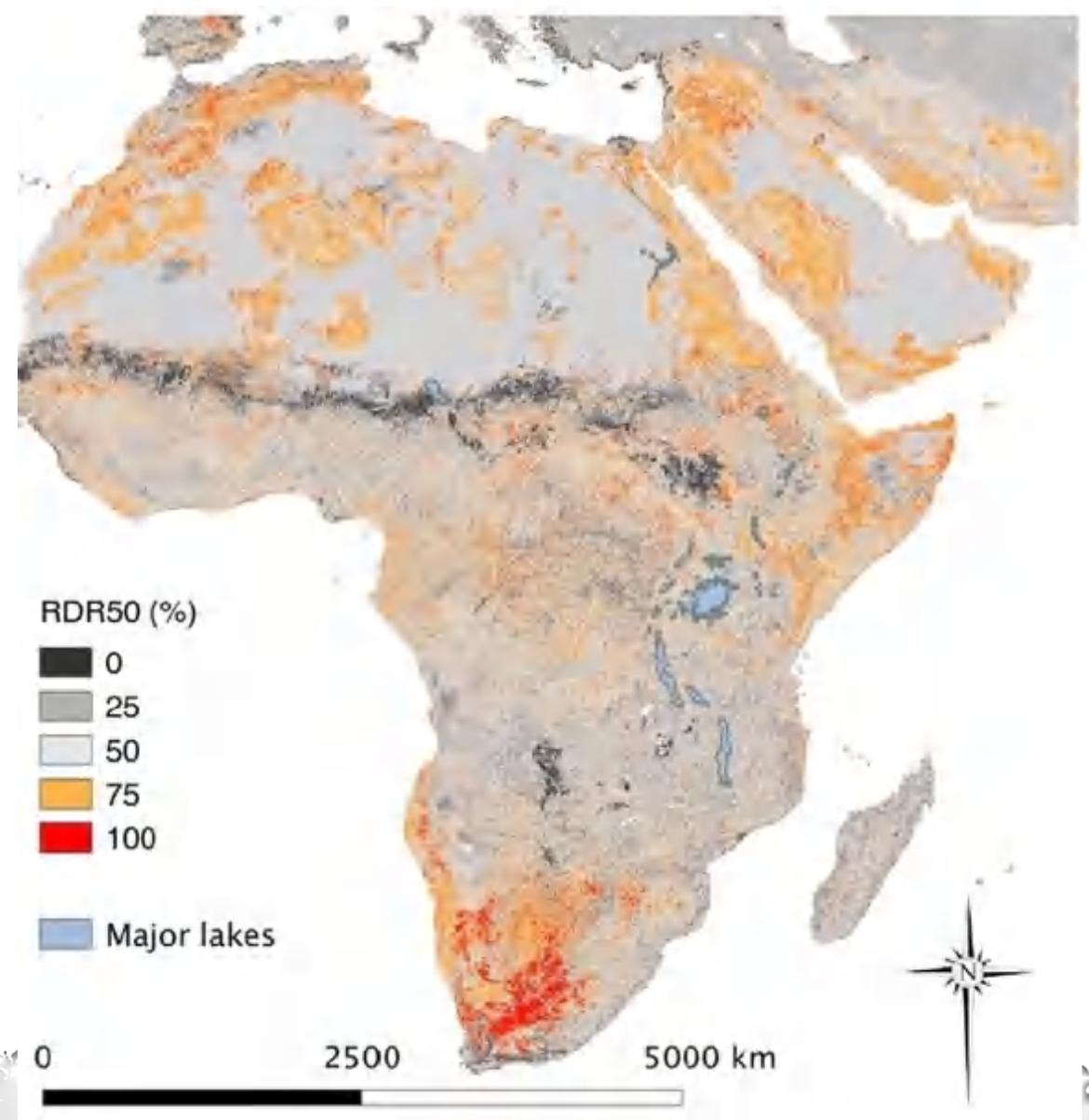
Global-level assessments for global crop and climate models

Vågen, T.-G.; Winowiecki, L.A. Predicting the Spatial Distribution and Severity of Soil Erosion in the Global Tropics using Satellite Remote Sensing. *Remote Sens.* **2019**, *11*, 1800. <https://www.mdpi.com/2072-4292/11/15/1800>

Mapping of Root Depth Restriction (RDR50) at 50 cm depth at 500-m Resolution

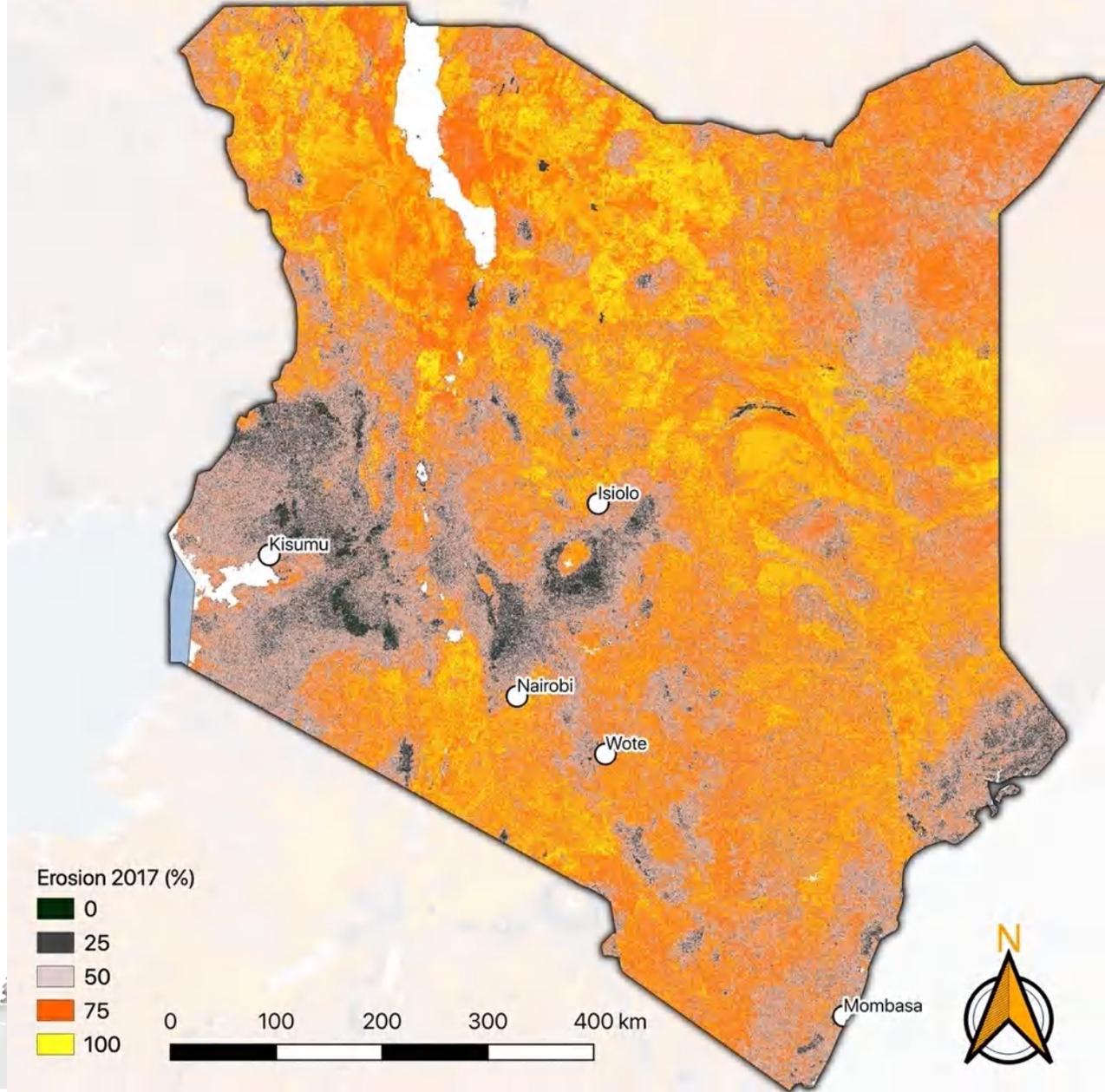
Advances in data analytics, soil spectroscopy and digital soil mapping have allowed for more accurate and real-time assessments of soil and land health, including land degradation status.

Vågen, Tor-G., Winowiecki, L., Tondoh, J.E., Desta, L.T. and Gumbricht, T. 2016. Mapping of soil properties and land degradation risk in Africa using MODIS reflectance. *Geoderma*. <http://dx.doi.org/10.1016/j.geoderma.2015.06.023>
<http://www.sciencedirect.com/science/article/pii/S0016706115300082>

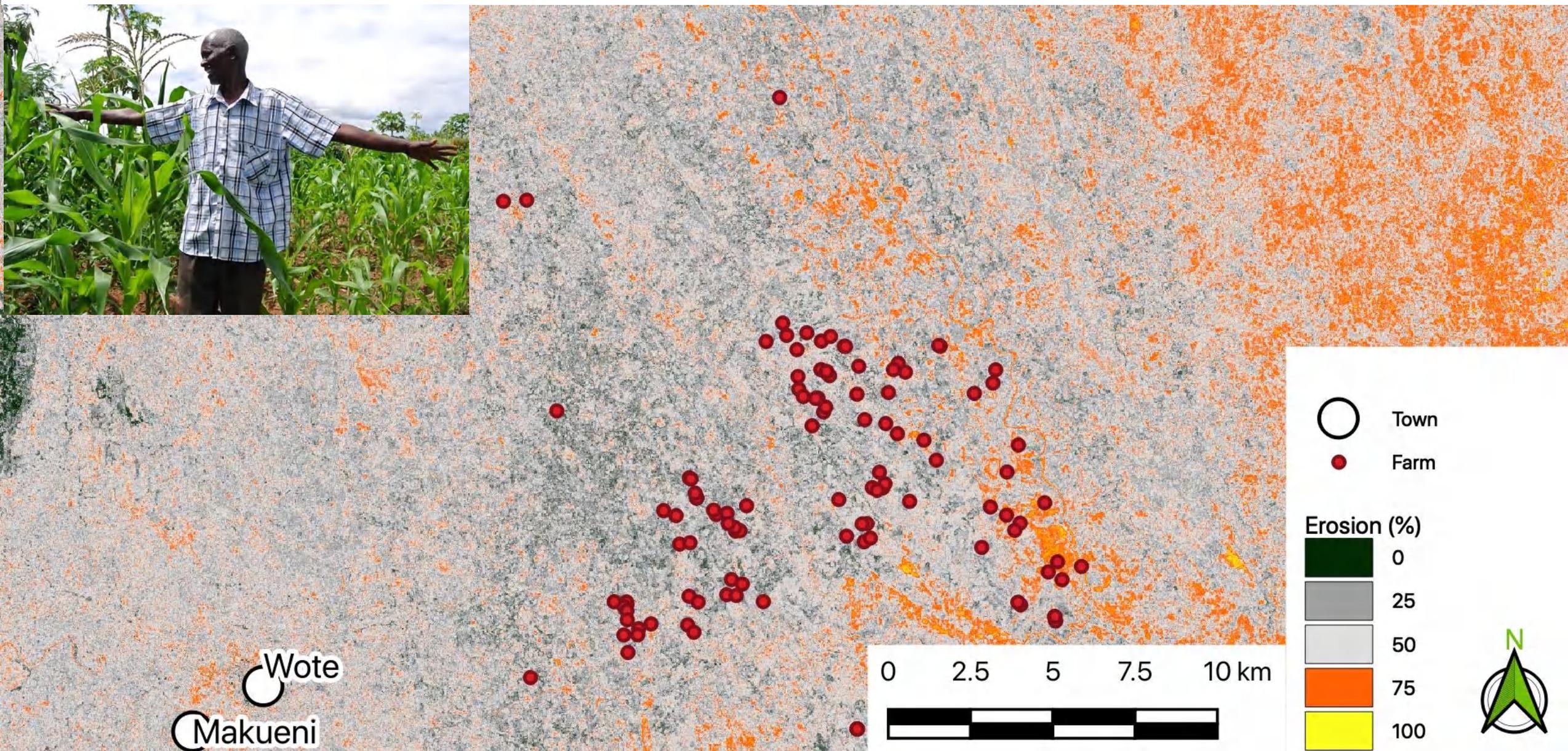


National-level Assessments for reporting on national commitments.

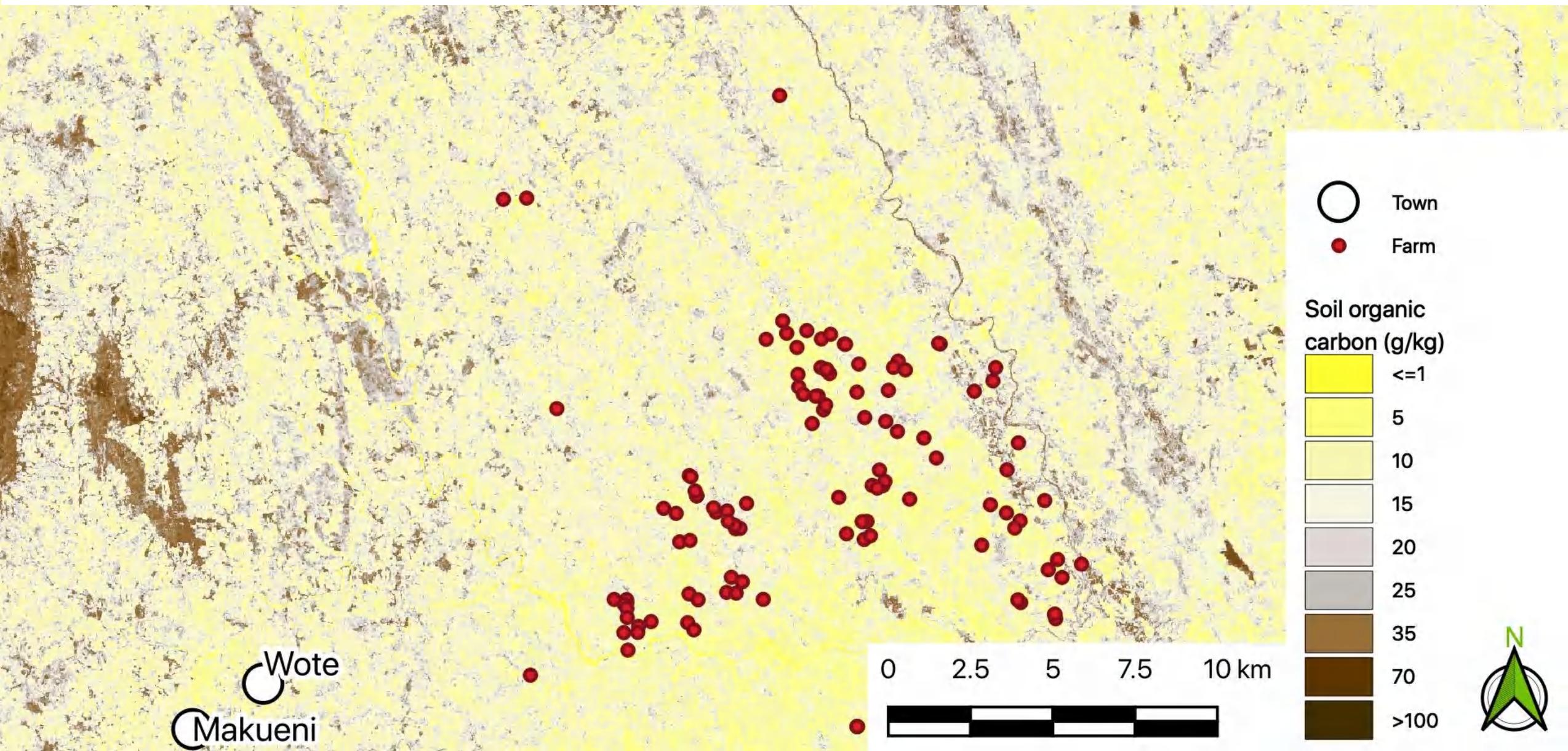
Example showing soil erosion in Kenya



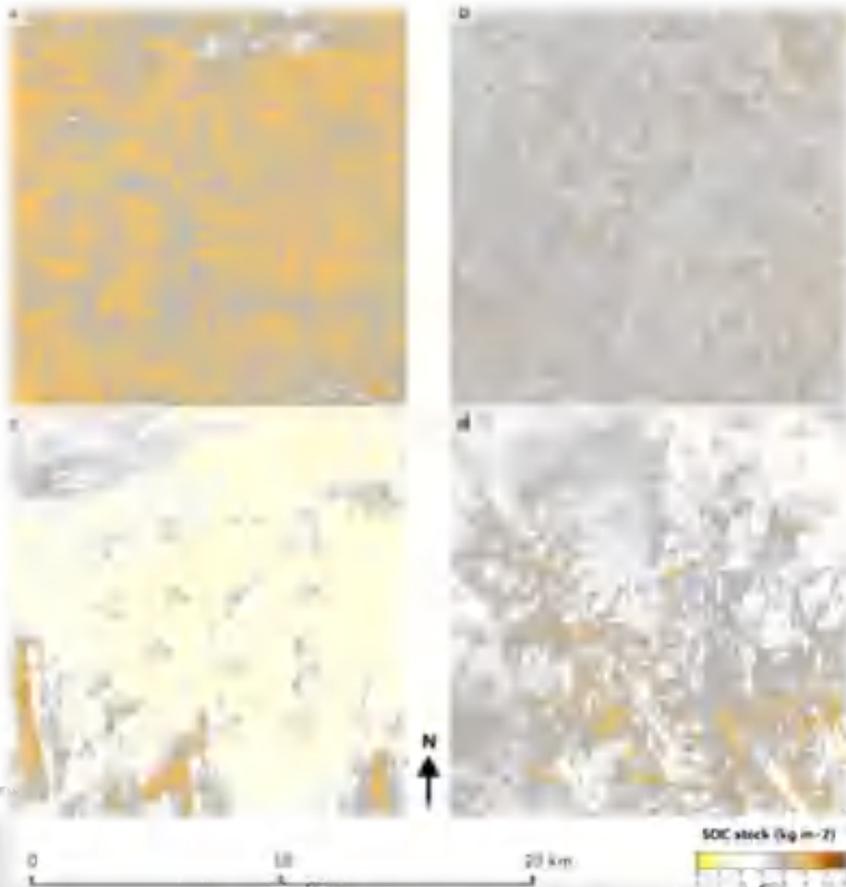
Farm-level assessments at 30 meter resolution to track what is happening at the farm/household level – impact of restoration/ management options on soil erosion



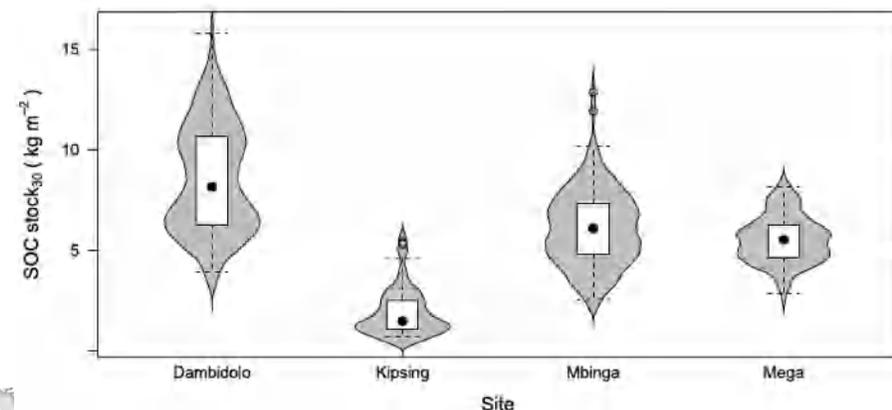
Important to assess multiple biophysical indicators at the same time to capture complexity: Example of soil organic carbon a key indicator of soil health



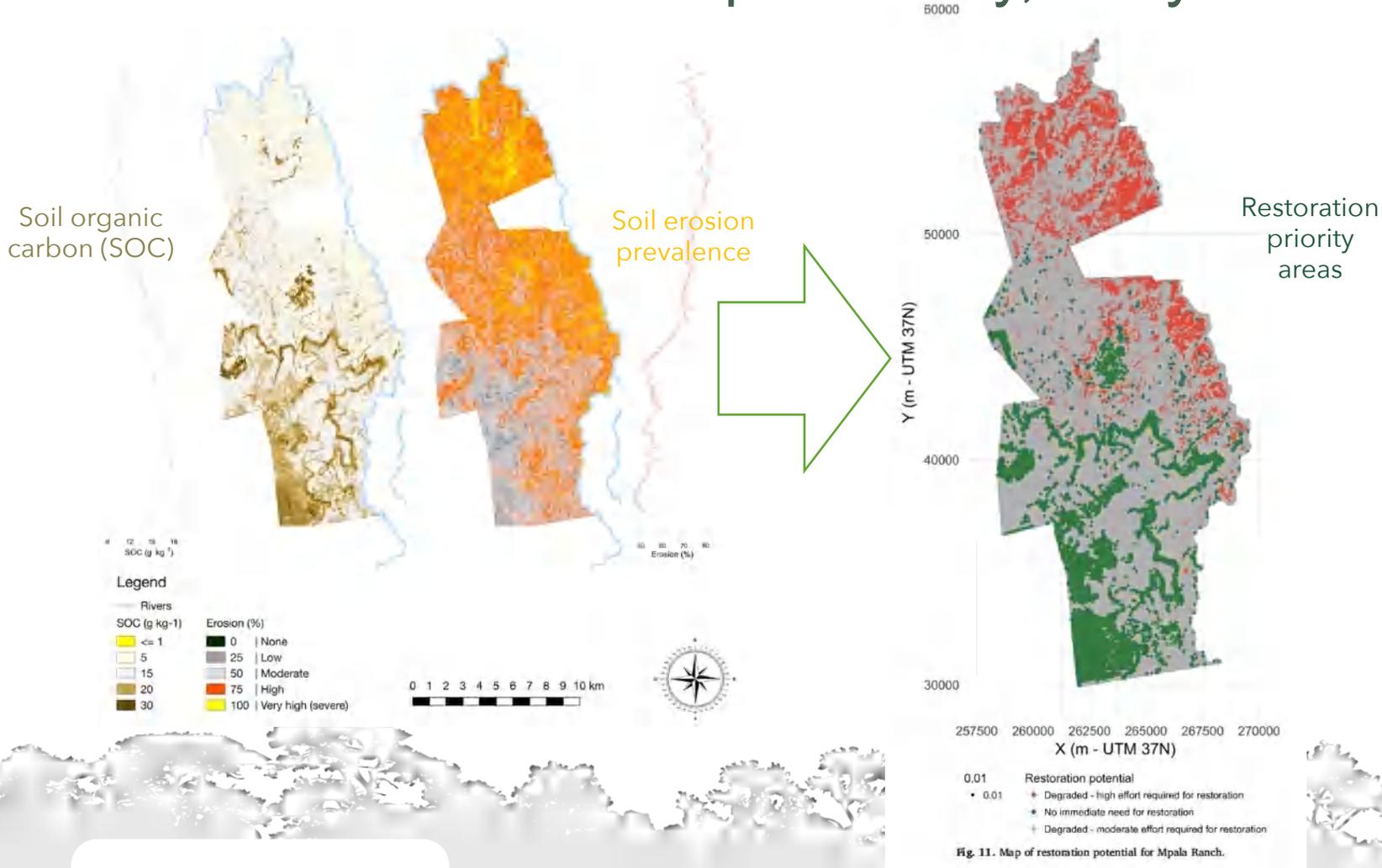
Example Output: Assessing Soil Carbon Storage as Potential Climate Change Mitigation Strategy



- Contrasting sites in Tanzania, Ethiopia and Kenya to demonstrate utility of method: SOC stocks to 30 cm
- To understand landscape patterns of SOC stocks
- SOC stocks are lower by 0.9 kg m² ($p < 0:01$) on average in eroded versus non-eroded areas.



Spatially explicit assessment of priority areas for restoration: SOC and Erosion in Laikipia County, Kenya



THE CONVERSATION
Academic rigor, practicality first

COVID-19 Arts + Culture Business + Economy Education **Environment + Energy** Health + Medicine Politics Science

Lessons from Kenya on how to restore degraded land

August 15, 2018 3:56pm SAST



One third of the world's land has been severely degraded from its natural state.

<https://theconversation.com/lessons-from-kenya-on-how-to-restore-degraded-land-98178>

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Restoration potential

- Degraded - high effort required for restoration
- No immediate need for restoration
- Degraded - moderate effort required for restoration

Fig. 11. Map of restoration potential for Mpala Ranch.



Winowiecki, LA., Vågen, T-G., Kinnaird, MF, TG. O'Brien. 2018. Application of systematic monitoring and mapping techniques: Assessing land restoration potential in semi-arid lands of Kenya. Geoderma.

<https://www.sciencedirect.com/science/article/pii/S001670611830510X>

Informing and tracking restoration in Rwanda

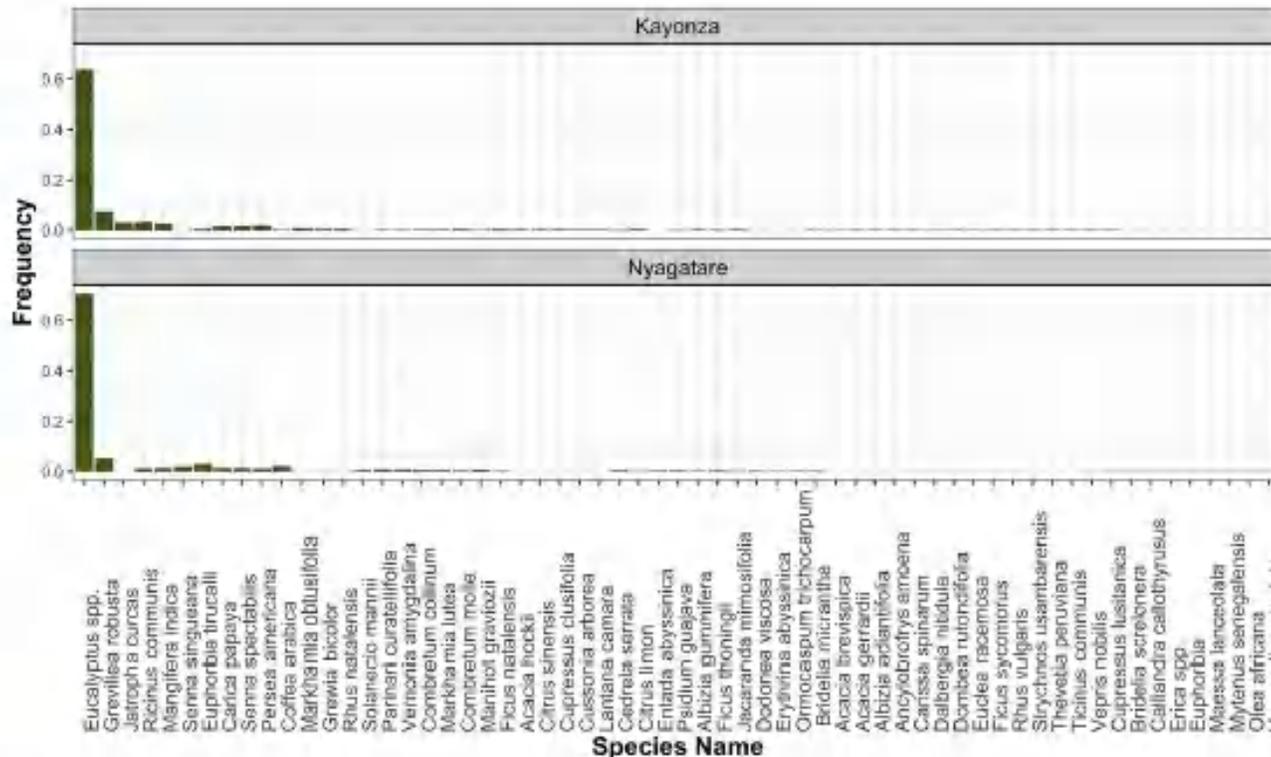
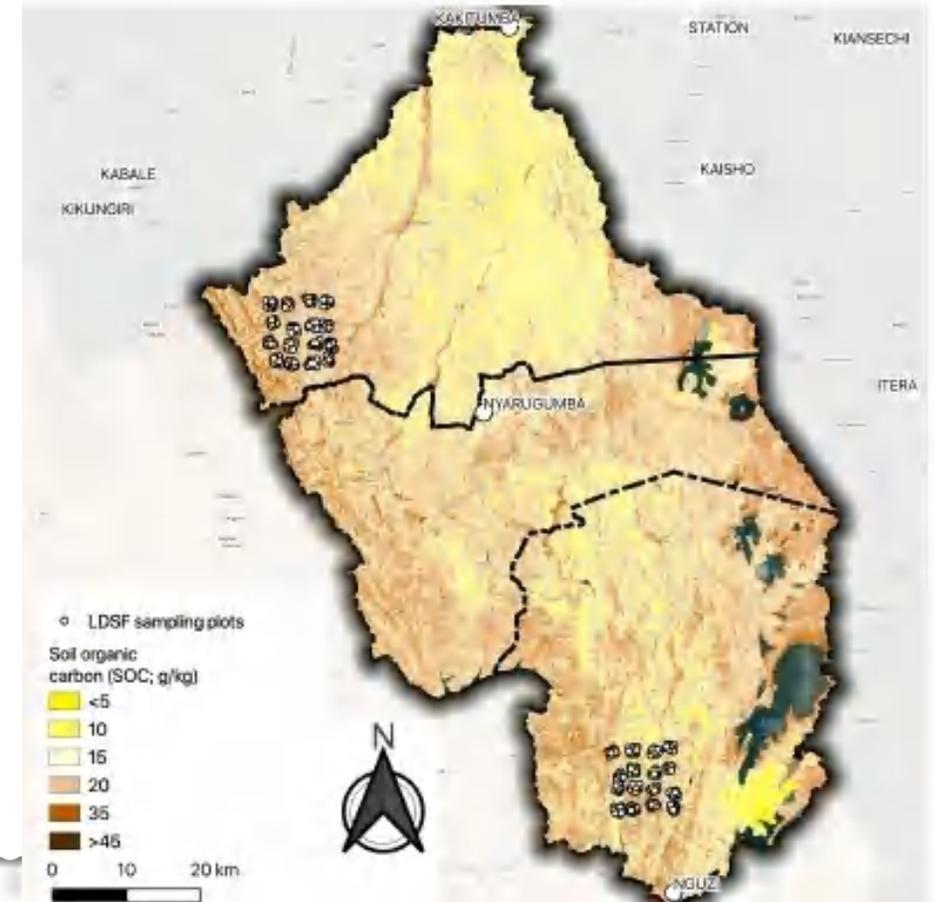


Figure 2. Tree species across the Kayonza and Nyagatare LDSF sites, Rwanda. Sixty-two different species were recorded, with low occurrence of most species and few indigenous tree species.



Winowiecki, L. A., Bargués-Tobella, A., Mukuralinda, A., Mujawamariya, P., Ntawuhiganayo, E. B., Mugayi, A. B., Chomba, S., and Vågen, T.-G. 2021. Assessing soil and land health across two landscapes in eastern Rwanda to inform restoration activities, *SOIL*, 7, 767–783, <https://doi.org/10.5194/soil-7-767-2021>



COMBINING MULTIPLE METHODOLOGIES TO ASSESS LAND DEGRADATION AND TARGET RESTORATION INTERVENTIONS

Remote sensing



Remote sensing data, coupled with on-the-ground measurements, enables robust spatially explicit assessments of key indicators.

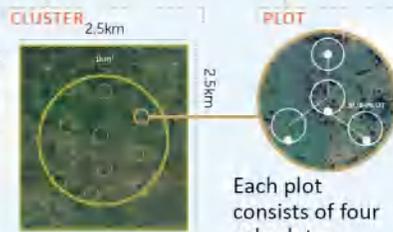


Systematic field sampling - using the LDSF



Assessing soil and ecosystem health using data collected using the Land Degradation Surveillance Framework (LDSF)

The LDSF uses a nested sampling design to monitor key soil and land health indicators. Each site is 100 km², with 160-1000m² sampling plots.



Each plot consists of four sub-plots [100m²].

Citizen science using the Regreening App



Geo-referenced data tracking implementation of land restoration activities on the ground using the Regreening App.

Engaging stakeholders in data collection - to track interventions and their impact



Interactive dashboards to review multiple sources of evidence for decision making



Citizen science data collection using the Regreening App

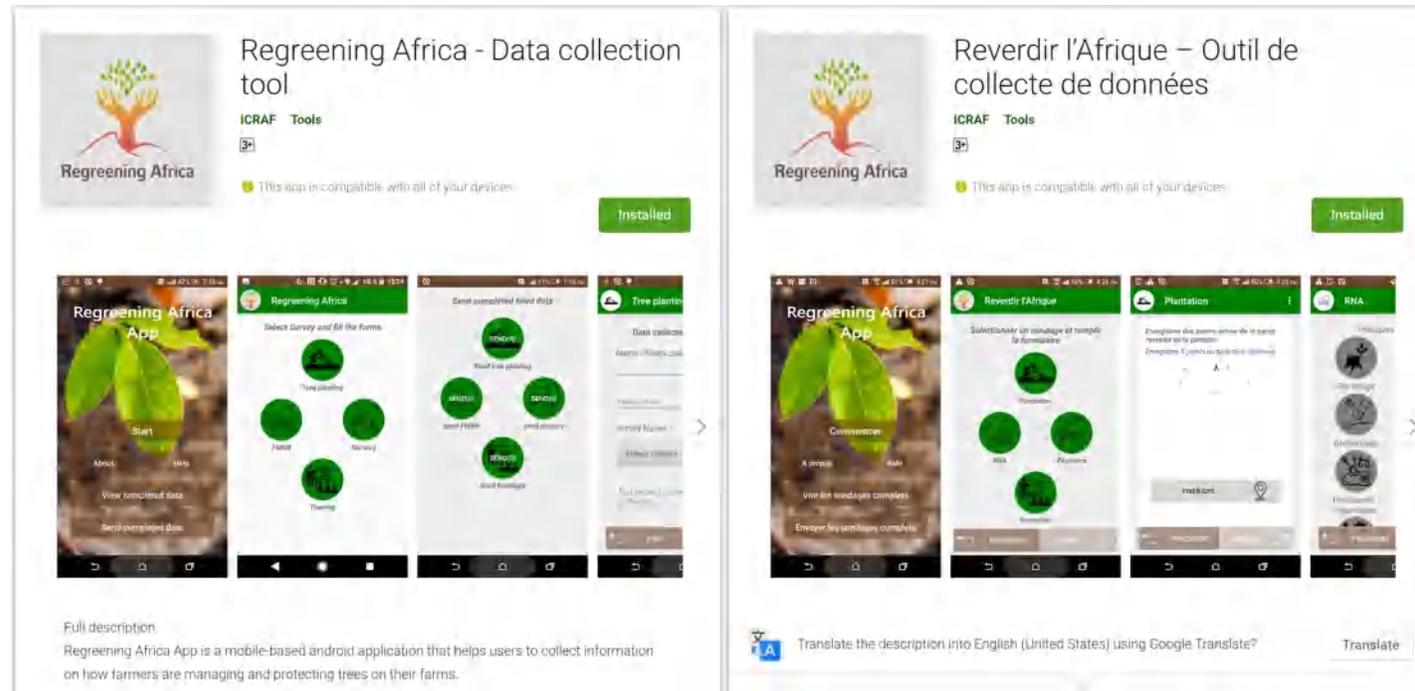
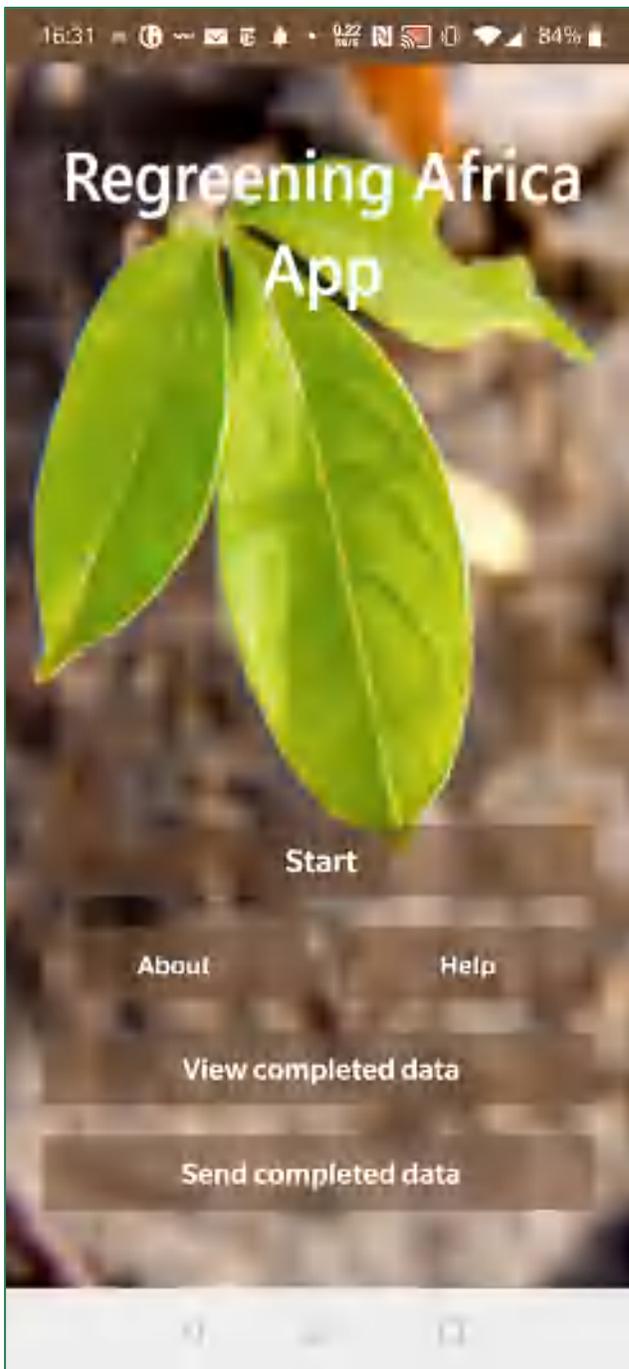
<https://play.google.com/store/apps/details?id=com.icraf.gsl.regreeningafrika&hl=en>

Used by (among others):

- Implementing partners
- Scientists
- Extension agents
- Lead farmers
- Nursery managers

Modules:

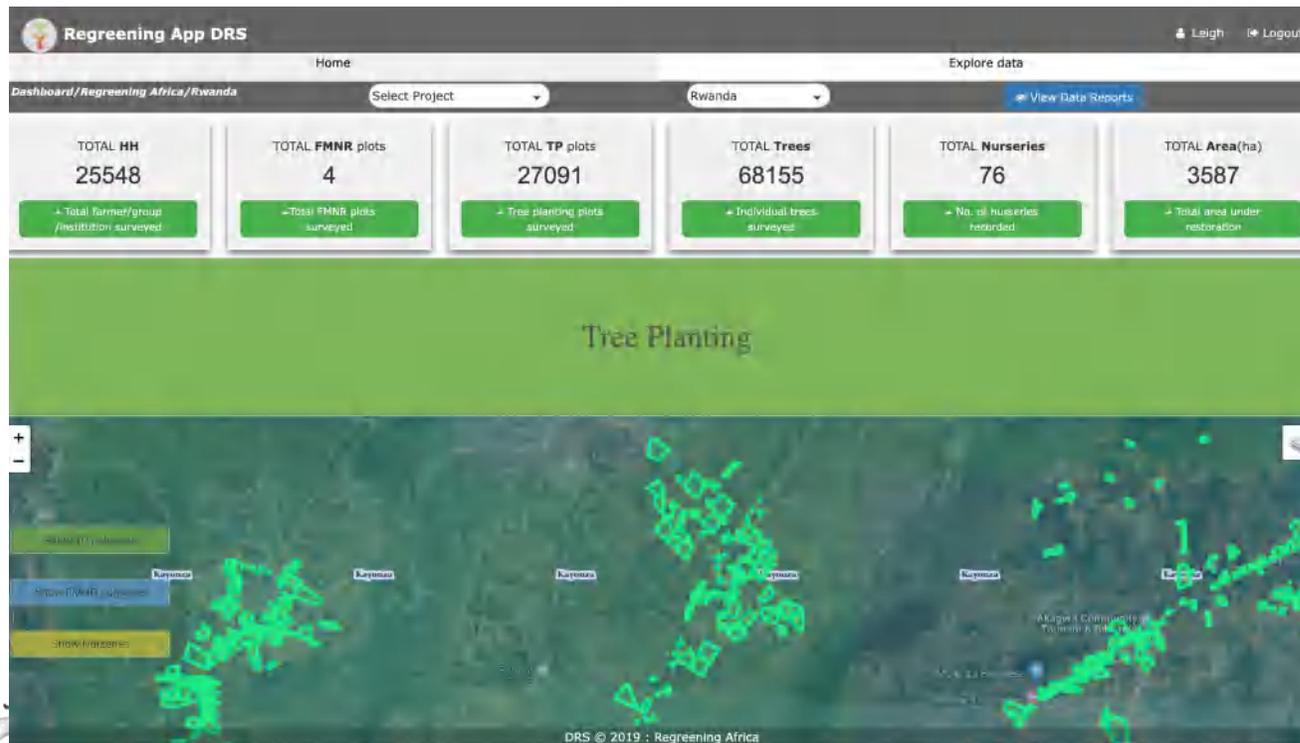
- Tree planting
- FMNR
- Nurseries
- Training



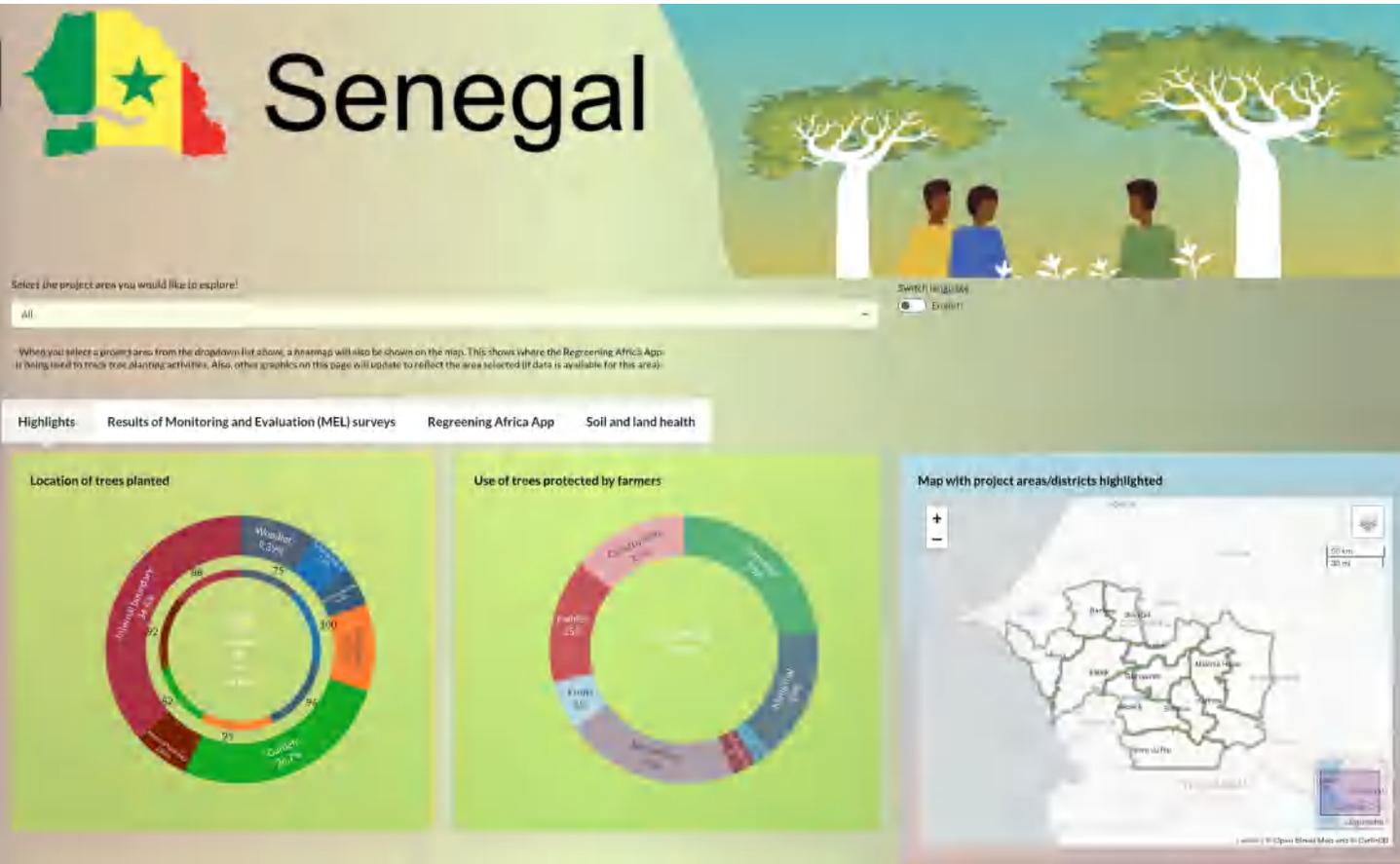
Full description
Regreening Africa App is a mobile-based android application that helps users to collect information on how farmers are managing and protecting trees on their farms.

Translate the description into English (United States) using Google Translate? [Translate](#)

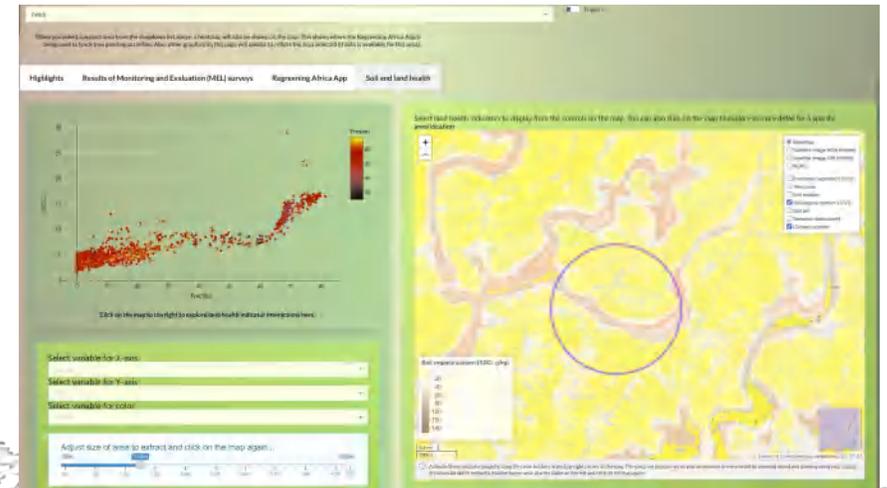
Online Data Reporting System to track progress on the ground



Online open-access Decision Dashboard that brings together the LDSF data and the citizen data collected with the App



- Explore and interrogate data
- Zoom into soil and land health maps
- Explore relationships between indicators



https://dashboards.icraf.org/app/ra_dashboard



Translating Science into action to accelerate impact on the ground: Stories of Transformation

Mongabay Series: [Global Agroforestry](#)

Farmers regreen Kenya's drylands with agroforestry and an app

by David Njagi on 26 August 2021



- *In Kenya, less than 20% of farmland is suitable for crops due to inadequate rains and degraded soils, and many farmers have seen their land produce less to the point of needing food aid.*
- *Dried-out soils create a hard pan that rains and roots can't penetrate, but in Kenya, more than 35,000 farmers have joined the Drylands Development Programme to regreen their lands with agroforestry, joining peers in Burkina Faso, Ethiopia, Mali and Niger.*
- *By planting annual crops among useful trees like mango, orange and neem, vegetables and animal forage crops receive enough cooling shade and moisture for them to take hold out of the scorching sun.*
- *As each farmer learns what combination of crops and trees works for them, the results are rapidly shared with researchers and fellow farmers through an app, speeding the rate at which all the program participants can benefit from the knowledge.*



<https://news.mongabay.com/2021/08/farmers-regreen-kenyas-drylands-with-agroforestry-and-an-app/>

<https://www.cifor-icraf.org/restoration-for-resilience/dryland/>





CA4SH Update



The main objective of the Coalition of Action 4 Soil Health (CA4SH) is to improve soil health globally by addressing critical implementation, monitoring, policy, and investment barriers that constrain farmers from adopting and scaling healthy soil practices



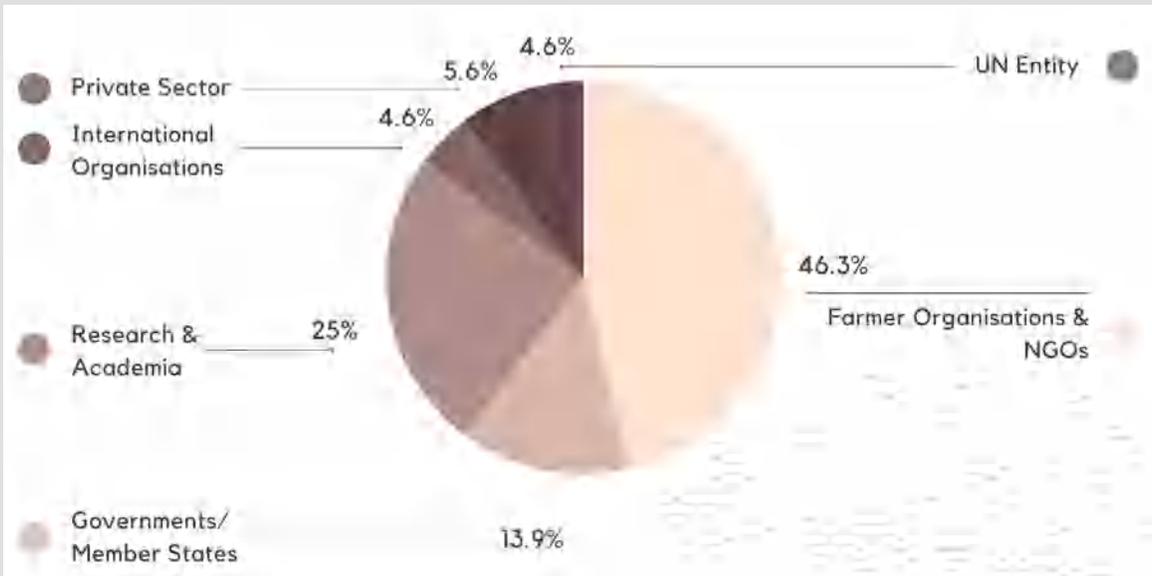
The goals of the Coalition include:

- **Integrate soil health considerations in policy** across the development, environment, and climate change domains, and along value chains.
- **Expand on research in development** into soil health practices, monitoring and evaluation, and financial tools and mechanisms.
- Significantly **increase** the number of hectares of **land under improved practices for soil health**.
- Significantly increase investments in soil health, by a margin of 5-10 fold above current financing commitments.





 **> 100 partners to date**



CA4SH UPDATES



Monthly Newsletter

August newsletter is out with many new updates, news, and partner highlights!



WELCOME TO THE CA4SH AUGUST NEWSLETTER!

The United Nations Framework Convention on Climate Change (UNFCCC) made the VERY exciting [announcement](#) that the COP27 in November will include the first-ever [Food Systems Pavilion](#).

So what does this momentous news mean for CA4SH?

We have been invited to co-lead the Pavilion where Day 5 will focus on *Boosting soil health for nature-positive production* and how soil can advance food security and acts as the world's biggest terrestrial carbon



Engagement Survey

4 flagship initiatives, 1 news story, 2 events highlighted on the website and in newsletter



Section 1 of 6

Partners' Engagement Survey

Dear Partners!

In order to gain momentum and work as a group, CA4SH is collecting information on our partners' activities. We are interested in what you are doing, if you have upcoming events or valuable resources to be shared with others. We aim to create a platform where members can share their projects, initiatives, events and resources and in this way inspire each other!

The form is divided into three parts:

- Upcoming events
- Flagship Initiatives
- Resources

You will find descriptions in each section on each of the three points with link leading to the website pages where your events/flagship initiatives/resources would be highlighted.

All questions in the form are optional, meaning that you are able to fill out all sections or no sections, depending on whether you have events, initiatives or resources you wish to share.

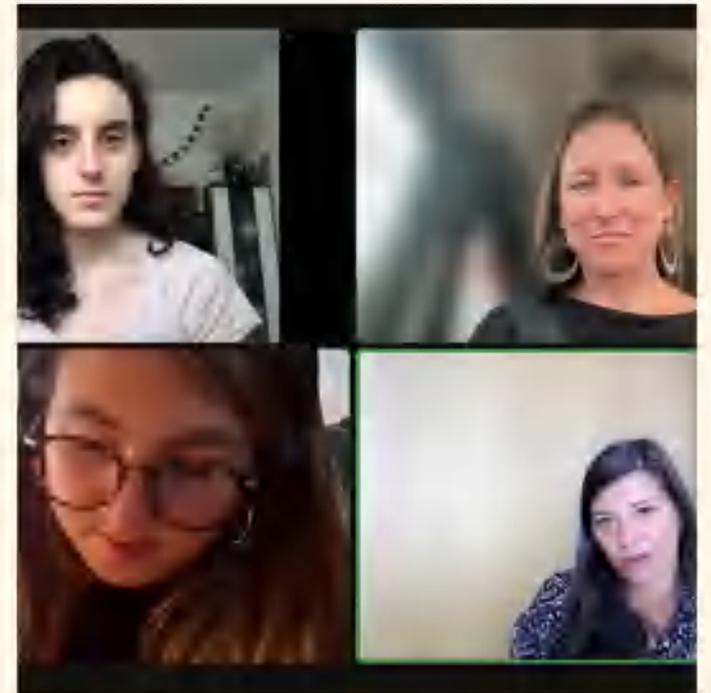
The form will be shared periodically with the members in order to stay engaged regularly, so if you currently don't have anything to share, don't worry, the form will be distributed again.

Note that you are still the owner of all content you share, and the CA4SH will only link to the existing webpage of the event/initiative/resource.



Collaboration Calls

One-on-one calls to discuss how CA4SH can support, joint activities and key outcomes



UNCCD FOOD DAY: Seeds of Change for a Nature-Positive Future

The first-ever UNCCD Food Day was held on May 12th at the Rio Pavilion, and CA4SH was there with bells on.

The session titled "Healthy Soil for a Healthy Planet" set a focus on how to transform our food systems from the soil up, as soil represents the very foundation of our food system. Through panel discussions, presentations and a Q&A session, CA4SH delivered a call to action for investment in global soil health.

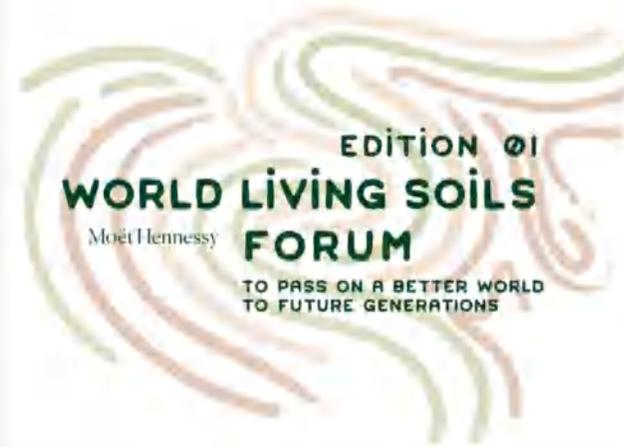
[Read the article](#)



Sustainable soil movement grows at COP15 on land desertification and drought

CA4SH Agriculture

Highlighting Partner Activities: Share your resources, links, events and

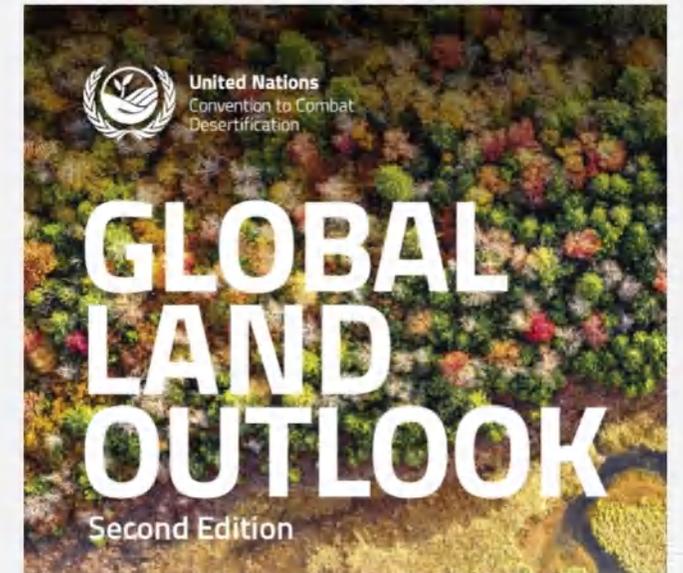


The World Living Soils Forum: Soil health action from the private sector

On June 1st & 2nd, the very first edition of the World Living Soils Forum (WLSF) was held in Arles-en-Provence, France, in an effort to "Mobilize and Act for Living Soils". The event was launched as part of the sustainability approach of Moët Hennessy, a multinational corporation that represents the Wine & Spirits division of LVMH Group.

Learn more about how the private sector can engage in advancing global soil health and hear what CA4SH's Dr. Leigh Winowiecki contributed to the event to answer the question of how and why we monitor soil carbon.

[Read the article](#)



What does the Global Land Outlook 2nd Edition say about soil health?

In May 2022, the UN Convention to Combat Desertification (UNCCD) issued the second edition of its flagship report, '[Global Land Outlook: Land Restoration for Recovery and Resilience](#)'.

The report seeks to share accessible, evidence-based strategies with stakeholders in an effort to advance and implement land restoration efforts across the Globe. But what does it have to say about soil? Find out!

[Read the article](#)

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UNFSS Coordination Hub Update

- 13 June 2022
- CA4SH presented in a plenary on **thought leadership**
- The hub is strategizing how to support Coalitions
- **Coalitions Compendium**



UNITED NATIONS
FOOD SYSTEMS
COORDINATION HUB



Events hosted by the CA4SH Global Team and Partners

6 –18th November 2022

Accelerating #ActionOnFood for people and planet

10 11 59 58
Days Hours Minutes Seconds

Co-hosts:

See all partners

WBCSD @ COP27
Bringing business together to avert the climate crisis

6-18 Nov

NOV 6

World Business Council for Sustainable Development at UNFCCC COP27

World Business Council for Sustainable Development is hosting several events at various Pavilions at the UNFCCC COP27 in Sharm el-Sheikh, Egypt.

Nov 6, 2022 – Nov 18, 2022 · UNFCCC COP27

NOV 14

INRAE JRD

COP27 SIDE EVENT The land sector: a game changer for a net zero CO₂, adaptation, biodiversity & food security

This side-event will bring points of view brought by a diversity of stakeholders to examine means and ways to address synergies and trade-offs to make the land sector a transformative key vector for climate biodiversity and food security in the perspectives of net zero CO₂.

Nov 14, 2022 · UNFCCC COP27, UN

NOV 16

4 PER 1000
SOILS TO FEED 10 BILLION

COP27
SHARM EL-SHEIKH EGYPT 2022

6th day of the "4 per 1000" Initiative day at UNFCCC COP27

The 6th Day of the "4 per 1000" Initiative at the UNFCCC COP27 is all about "Healthy Soils for a Healthy Planet".

CA4SH

BOOSTING SOIL HEALTH FOR NATURE POSITIVE PRODUCTION

NOV 11

FOOD SYSTEMS PAVILION COP27

CA4SH at the UNFCCC COP27 Food Systems Pavilion: Boosting soil health through nature-positive production

CA4SH is co-hosting the Food Systems Pavillion at the UNFCCC COP27, alongside partners from the CA4SH Global Team. Day 5 of the Pavilion will be dedicated to boosting soil health.

Nov 11, 2022 · UNFCCC COP27

NOV 15

RIISING UP FROM DROUGHT TOGETHER

Rising up from drought together: Towards global action for drought resilience

This high-level session features the importance of a collaborative approach to address drought proactively at all levels, through holistic approaches that include early warning, prevention, response and ultimately building drought resilience.

Nov 15, 2022 · UNFCCC COP27, UN

<https://www.coalitionforsoilhealth.org/ca4sh-events>



BOOSTING SOIL HEALTH DAY

11 NOVEMBER 2022



- 9-9:45** Boots on the ground: What should the private sector do to boost regenerative agriculture? - **reNature**
- 10-10:45** Rethinking the soil-forest-food nexus through regenerative agriculture - **EDF/FOLU**
- 11-11:45** Co-host session: Carbon farming: Its value and potential - **Rabobank**
- 12-12:45** Taste the Soil: The Silent Ally that Feeds You - **CA4SH**
- 13-14:00** Plenary: Soil Health Resolution - **CA4SH**
- 14-15:45** Partner session: Re-thinking Public Spending - **Just Rural Transition**
- 16-16:45** Soils as an asset: galvanizing public support to achieve our shared ambitions for NDCs - **CA4SH**
- 17-17:45** Food Security Partnerships, Programs and Policy Solutions: The Ground we Need to Feed - **CA4SH**
- 18-18:45** Creating win-wins on soil? Rewarding small-holder farmers for building soil organic carbon- **EDF & ATREE**
- 19-19:45** Sustainable Agriculture and Food Security: Climate-proofing agricultural systems for better food security - **OCI**

<https://foodsystemspavilion.com> #COP27Soil #SoilResolution #ActionOnFood

#ActionOnFood #COP27Soil #SoilResolution

<https://foodsystemspavilion.com/thematic-day/11-nov-boost/>

SOIL HEALTH RESOLUTION @ COP 27

- CA4SH with partners have drafted the Soil Health Resolution
- The draft Soil Health Resolution will be launched at the UNFCCC COP 27
- Read it here:
<https://www.coalitionforsoilhealth.org/soil-resolution>
- Reach out to countries, contacts, member states!
- CA4SH Coordination Team
coordination@coalitionforsoilhealth.org
- Join us all day 11 Nov- first-ever Boosting Soil Health Day @COP27 #COP27Soil #SoilResolution



CA4SH **4 PER 1000** **COP27 SHARM EL-SHEIKH EGYPT 2022**

Soil Health Resolution of Soil Champions at COP 27

A commitment to enable and scale soil carbon sequestration practices to mitigate climate change. Soil carbon sequestration helps to combat climate change. It can also restore biodiversity, improve water resilience, increase nutritious yields and enhance food security.

Therefore, the signatories (government leaders, private sector, farmer representatives):

AFFIRM that agricultural systems are part of the solution, mainly through large-scale adoption of sustainable soil and land management practices that benefit nature and people, serving as nature-based solutions such as regenerative agriculture, agroecology, and other approaches for mitigating global warming while also ensuring long-term productivity and enhanced resilience;

CONSIDER the critical role played by increased soil health to achieve the objectives of the UN Decade of Ecosystem Restoration;

REAFFIRM the need for further international action and cooperation to revert current soil degradation processes and that Member states have yet to support a resolution on soil health at the UNFCCC, based on the outcome of the UN Food Systems Summit and the development of the Coalition of Action for Soil Health (CA4SH) and the Private Sector Guiding Group Coalition on Soil Health.

STRESS the importance of aligning UN conventions for climate change, biodiversity, and land-degradation neutrality would further reduce overlapping organisational efforts and accelerate the identification of regional priority areas;

RECOGNISE that soils are the basis of life and soil health is the foundation of sustainable and regenerative food systems and food and nutrition security, and for improving livelihoods and supporting economic development;

<https://www.coalitionforsoilhealth.org/resource-library/soil-health-resolution-of-soil-champions-at-cop27>
Contact us at: coalition4soilhealth@gmail.com

SOIL HEALTH PLENARY RESOLUTION @ COP 27 11Nov 2022 13:00-14:00 UTC +2

- Join us all day 11 Nov- first-ever Boosting Soil Health Day @COP27 #COP27Soil #SoilResolution
- <https://foodsystemspavilion.com/book/partner-session/>

Soil Health Resolution

Coalition of Action 4 Soil Health (CA4SH)

🕒 13:00 – 14:00 GMT+2

[Add to Calendar](#) ▼

Healthy soil is the foundation of sustainable and regenerative food systems and provides vital ecosystem services, while also representing significant emission-saving opportunities. Efforts to combat desertification, to move from scarcity to prosperity, will need to consider how to scale soil health, globally. With over one-third of the Earth's surface degraded and over 3.2 billion people negatively affected by degradation, continuing business as usual is no longer an option. Now is the time for multi-stakeholder action to build an enabling environment at multiple levels for supporting, financing, scaling, and monitoring healthy soil ecosystems.

The objectives of this session are to 1) Raise awareness of and support for the critical role of healthy soil to achieve the SDGs; 2) Garner support for the Soil Health Resolution; 3) Highlight examples from national advocates of soil health.

This session will contribute to the COP27 by bringing together diverse stakeholders from science, policy, development, conservation, and the private sector to garner support for scaling investments in soil health. The session will provide meaningful content and insights to the final statements coming out of the COP27.

Session speakers



Satya S. Tripathi
Global Alliance for a Sustainable Planet



Barbara Baarsma
Rabo Carbon Bank



Paul LUU
4 per 1000 Initiative



María Cecilia Ginés
Argentine No-till Farmers Association



Joao Campari
World Wildlife Fund



Leigh Ann Winowiecki
CIFOR-ICRAF



Alex Awiti
CIFOR-ICRAF



Adrian Leitoro
Nature and People as One



Kelly Witkowski
Inter-American Institute for Cooperation on Agriculture (IICA)



COMING
SOON

Coming soon
European Commission



COMING

Thank you!

Leigh Ann Winowiecki L.A.Winowiecki@cgiar.org

Tor-Gunnar Vågen T.Vagen@cgiar.org

Check out CIFOR-ICRAF Soil and Land Health Webpage for videos, brochures, and more:

<https://worldagroforestry.org/landhealth>

Video: Scaling ecosystem restoration in agricultural landscapes:

<https://youtu.be/qvf0drWdTq4>

AlJaZeera Earthrise special: <http://youtu.be/vFMSEHV7Ap4>

cifor.org | worldagroforestry.org

foreststreesagroforestry.org | globallandscapesforum.org | resilientlandscapes.org

The Center for International Forestry Research (CIFOR) and World Agroforestry (ICRAF) envision a more equitable world where forestry and landscapes enhance the environment and well-being for all. CIFOR-ICRAF are CGIAR Research Centers.

