

## 10 Years of ProSoil: Sharing knowledge on good practices in soil protection and rehabilitation through the WOCAT Global Database on Sustainable Land Management

10 ans de ProSol : Partage des connaissances sur les bonnes pratiques en matière de protection et de réhabilitation des sols à l'aide de la base de données mondiale WOCAT sur la gestion durable des terres

5 July 2024  
5 juillet 2024

Nicole Harari & Dennis Mucee Ncurai



Implemented by

# Netiquette

- Make sure you are in a **quiet environment** (e.g. switch off other devices to silent (mobile phone etc.).
- Using a **headset** (or headphones) helps.
- **Mute** yourself and **turn your camera** off if you are **not speaking**.
- If you **speak**, please **share your camera** if the internet connection allows.
- Make it interactive and use emoticons to react to what is said!



# Netiquette

- *S'assurer de pouvoir **participer sans être dérangé** (p.ex. éteindre le portable).*
- *L'utilisation d'un **casque/ microphone externe** (p.ex. de votre écouteur du téléphone portable) aide.*
- *Veillez **éteindre votre micro** quand vous **ne parlez pas** et **éteindre votre camera**.*
- *Si vous **parlez**, veuillez **partager votre caméra** si la connexion internet le permet.*
- *Rendez-le interactif et utilisez des émoticônes pour réagir à ce qui est dit!*



# Agenda // Ordre du jour

- I. Welcoming words  
Mots de bienvenue
- II. The Global Programme “Soil Protection and Rehabilitation for Food Security“ (ProSoil)  
Programme global « Protection et réhabilitation des sols pour la sécurité alimentaire » (ProSol)
- III. ProSoil’s collaboration with WOCAT  
Collaboration ProSol avec WOCAT
- IV. The decision support system for land degradation neutrality in Kenya  
Le système d’aide à la décision pour la neutralité en matière de dégradation des terres au Kenya
- V. Questions & Answers  
Questions & Réponses



# Speakers // Intervenants

## Nicole Harari

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## Dennis Mucee Ncurai

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WOCAT



GIZ Global Programme ProSoil



# The Global Programme “Soil protection and rehabilitation for food security” in a nutshell

## Le Programme global « Protection et réhabilitation des sols pour la sécurité alimentaire » en bref

# Special Initiative Transformation of Agricultural and Food Systems

## Initiative spéciale Transformation des systèmes agricoles et alimentaires



### Setting the German framework Définir le cadre allemand

**Implementation:** GIZ, KfW, private sector, civil society, research institutes, foundations, NGOs

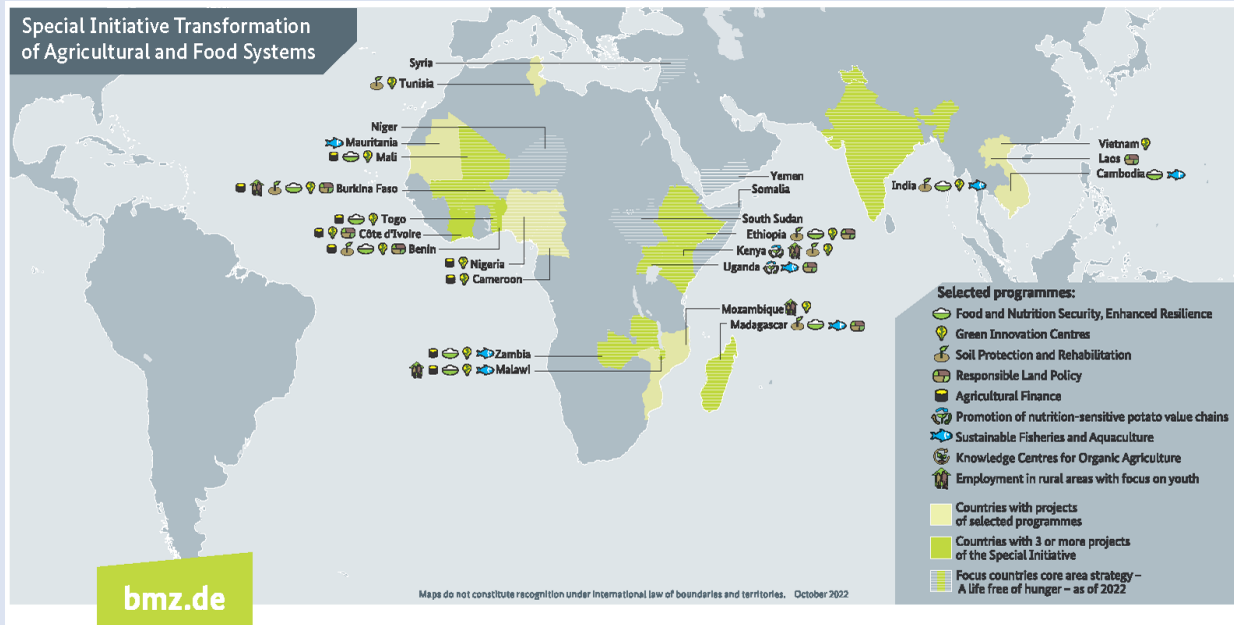
**GIZ-Share:** 30 programmes (Budget: 2,1 billion EUR, as of July 2023)

**Mise en œuvre :** GIZ, KfW, secteur privé, société civile, instituts de recherche, fondations, ONG

**GIZ-Share :** 30 programmes (Budget : 2,1 milliards d'euros, en juillet 2023)



German Federal Ministry for Economic Cooperation and Development (BMZ) // Ministère fédéral allemand de la Coopération économique et du Développement (BMZ)



<https://www.foodfortransformation.org/>

# Why a focus on soils?

## Pourquoi se concentrer sur les sols ?



1

Soils are a valuable and non-renewable resource // Les sols sont une ressource précieuse et non renouvelable

2

Climate change intensifies degradation due to droughts or increasingly frequent heavy rainfall // Le changement climatique intensifie la dégradation due aux sécheresses ou aux fortes pluies de plus en plus fréquentes

3

In particular, smallholder farmers in developing countries experience the consequences: Soil degradation impacts their income and food supply directly // Les petits exploitants agricoles des pays en développement en subissent les conséquences : la dégradation des sols a un impact direct sur leurs revenus et leur approvisionnement alimentaire

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# ProSoil in a nutshell

## ProSol en bref



**Duration:** 11/2014 until 04/2027 (12 years, 5 months)

**Durée :** 11/2014 à 04/2027 (12 ans, 5 mois)

**Contract value: 231 million EUR**

incl. 8 million EUR EU-cofinancing in the area of agroecology (EU DeSIRA) and 3 million EUR co-financing by the Bill & Melinda Gates Foundation

**Valeur du contrat : 231 millions EUR**

dont 8 millions d'euros de cofinancement de l'UE dans le domaine de l'agroécologie (EU DeSIRA) et un cofinancement de 3 millions d'euros par la Fondation Bill & Melinda Gates



**Goal:** Agroecological approaches for sustainable, climate-smart soil protection and rehabilitation have been implemented at scale in selected partner countries.

**Objectif :** Des approches agroécologiques pour la protection et la réhabilitation durables et intelligentes des sols ont été mises en œuvre à grande échelle dans certains partenaires.





# Our three fields of action

## Nos trois champs d'action



### Field of action 1 // Champs d'action 1



Implementation of agroecological measures for climate-smart soil protection and rehabilitation (SRP)

*Mise en œuvre de mesures agroécologiques pour la protection et la réhabilitation des sols (SRP) intelligentes face au climat*

### Field of action 2 // Champs d'action 2



Improving the political, institutional and societal anchoring of soil protection and rehabilitation (SRP)

*Améliorer l'ancrage politique, institutionnel et sociétal de la protection et de la réhabilitation des sols (PRS)*

### Field of action 3 // Champs d'action 3



Make use of lessons learned and innovations in soil protection and rehabilitation shared at a national and international level //

*Utiliser les leçons apprises et les innovations en matière de protection et de réhabilitation des sols partagées aux niveaux national et international*





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## Global Programme Soil Protection and Rehabilitation for Food Security (ProSoil)

[Conserving and rehabilitating soil to promote food security and climate protection - giz.de](https://www.giz.de)



## Programme global Protection et réhabilitation des sols pour la sécurité alimentaire (ProSol)

[Protéger et restaurer les sols – pour l'alimentation et la protection du climat - giz.de](https://www.giz.de)





# ProSoil's collaboration with WOCAT

## Collaboration ProSol avec WOCAT

# About WOCAT

## À propos de WOCAT



The World Overview of Conservation Approaches and Technologies (WOCAT) is a **global Network established in 1992.**

Le World Overview of Conservation Approaches and Technologies (WOCAT) est un **réseau mondial créé en 1992.**

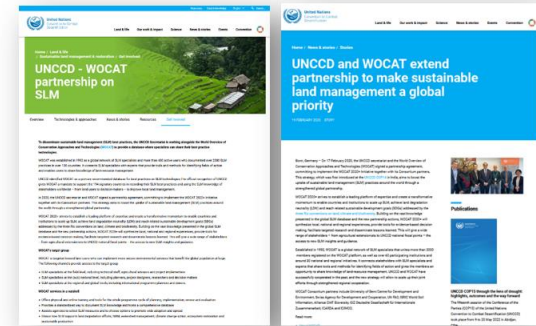
### Consortium Partners



### Funding Partners



### UNCCD knowledge Partner



## About WOCAT

### À propos de WOCAT



WOCAT supports the compilation, documentation, evaluation, sharing, dissemination, and application of **sustainable land management (SLM) knowledge**.

In 2014, WOCAT's growth and ongoing improvement culminated in being **officially recognized by the UNCCD** as the primary recommended Global SLM Database for best SLM practices.

WOCAT soutient la compilation, la documentation, l'évaluation, le partage, la diffusion et l'application des connaissances sur la **gestion durable des terres (GDT)**.

En 2014, la croissance et l'amélioration continue de WOCAT ont abouti à la **reconnaissance officielle de la UNCCD** comme la principale base de données mondiale recommandée pour les meilleures pratiques en matière de GDT.

# WOCAT pillars & ProSoil

## Piliers WOCAT et ProSol

Google Earth Engine apps for mapping land degradation and LDN  
 Applications Google Earth Engine pour cartographier la dégradation des terres et la NDT

ProSoil stakeholders form part of the network  
 Les parties prenantes de ProSoil font partie du réseau

maintain global, open SLM network



ProSoil good practices available in WOCAT SLM Database  
 Les bonnes pratiques ProSoil disponibles dans la base de données WOCAT GDT



harmonize and further develop tools and methods with partners



# WOCAT

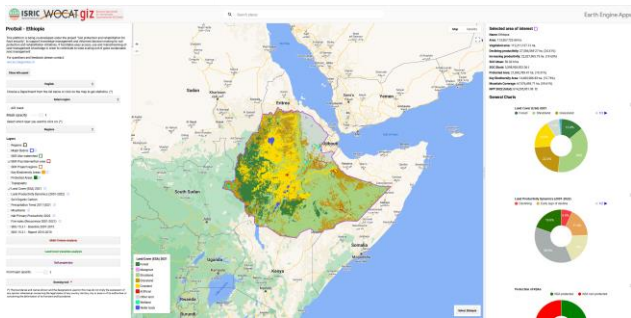


provide open access global SLM data repository



build capacities at local, regional and national level

SLM documentation & mapping land degradation  
 Documentation et cartographie de la dégradation des terres




# Documentation and sharing of SLM good practices

## Documentation et partage des bonnes pratiques en matière de GDT

- 1) **Inventory** sheet of SLM good practices in different country packages

**Fiche d'inventaire** des bonnes pratiques en matière de GDT dans différents packages nationaux

- 2) **Pre-selection** of SLM good practices to be documented (*criteria*: cover, productivity, carbon stocks, livelihoods, drought resilience, link to UNCCD and other conventions, government priority, level of adoption...)

**Présélection** des bonnes pratiques de GDT à documenter (critères : couverture, productivité, stocks de carbone, moyens de subsistance, résilience à la sécheresse, lien avec la CLD et d'autres conventions, priorité gouvernementale, niveau d'adoption...)



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# Documentation and sharing of SLM good practices

## Documentation et partage des bonnes pratiques en matière de GDT

- 3) **Hands-on training** on documentation and **final selection** of good practices  
**Formation pratique** sur la documentation et **sélection finale** des bonnes pratiques
- 4) **Documentation** with land users in the field  
**Documentation** avec les utilisateurs des terres sur le terrain
- 5) **Data entry** in WOCAT Database  
**Saisie des données** dans la base de données WOCAT
- 6) **QA and review process, publication and translation**  
**Assurance qualité et processus d'évaluation, publication et traduction**



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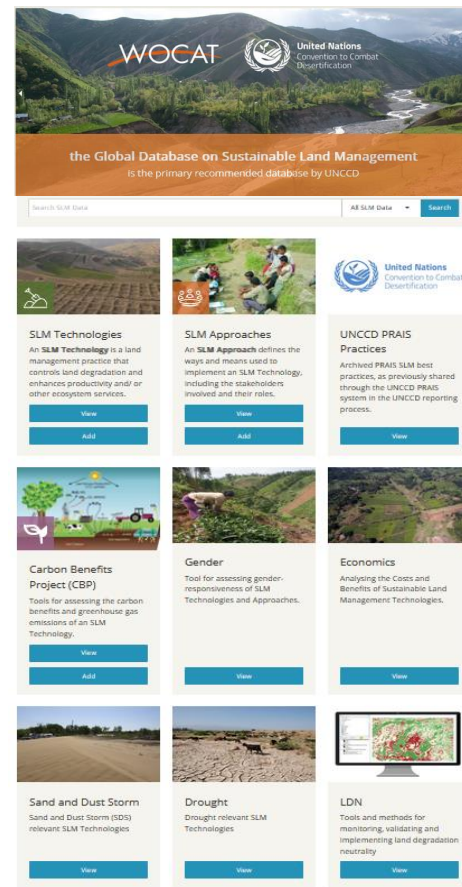
# WOCAT Database

## Base de données WOCAT



### Main features

- ✓ **free upload and worldwide sharing** of countries' good SLM practices in English, Spanish, French, Russian, Chinese, Portuguese and other languages  
**téléchargement gratuit et partage mondial** des bonnes pratiques de GDT des pays en anglais, espagnol, français, russe, chinois, portugais et autres langues
- ✓ **free access** to 2200+ reviewed, proven, field-tested SLM practices from over 130 countries  
**accès gratuit** à 2200+ pratiques de GDT révisées, éprouvées et testées sur le terrain dans plus de 130 pays
- ✓ **standardized summary** of all Technologies and Approaches can be downloaded in various languages  
**un résumé normalisé** de toutes les technologies et approches peut être téléchargé dans différentes langues



<https://qcat.wocat.net>

giz

# WOCAT Database

## Base de données WOCAT



### Main features

#### Main features

- ✓ **database filter** to find relevant SLM practices for specific landscapes, land uses etc.  
pour trouver des pratiques de GDT pertinentes pour des paysages spécifiques, des utilisations des terres, etc.
- ✓ possibility to integrate national SLM good practices in national/project/global platforms **through API**  
possibilité d'intégrer les bonnes pratiques nationales en matière de GDT dans les plateformes nationales/projets/mondiales **via l'API**

*UNCCD parties and other reporting agencies are encouraged to enter and share SLM best practices in the WOCAT SLM Database, and report in PRAIS under "Implementation Framework"/"Actions on the ground" (section 7.4.1 of the PRAIS reporting manual)*

*Les Parties à la CLD et les autres organismes d'établissement des rapports sont encouragés à entrer et à partager les meilleures pratiques en matière de GDT dans la base de données WOCAT sur la GDT, et à faire rapport dans le PRAIS sous la rubrique « Cadre de mise en œuvre »/« Actions sur le terrain » (section 7.4.1 du manuel de notification du SNAP)*

# WOCAT Database

## Base de données WOCAT



### Main features

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Search  All SLM Data


Country:  Project:  Institution:  Language:


Advanced filter for:  SLM Technologies  SLM Approaches


Project:


Only data declared as public are visible.


Your search results (87)

- 

**Gmelina-Based Agroforestry [Benin]**  
Gmelina trees as a basis for an agroforestry system help increase the soil's organic matter content, foster associated biodiversity, optimize the hydrological cycle, mitigate soil erosion, and generate income.  
Compiler: Gatién AGBOKOUN CHRISTOPHE 03/04/2023 8:21 p.m.
- 

**Biochar Production and Application to Improve Soils [Benin]**  
Biochar is generated through the process of pyrolysis (partial combustion) of plant biomass like corn cobs or forest residues. In a heat-intensive, oxygen-free or low-oxygen environment. By spreading biochar on fields, the objective is to enhance the nutrient-holding capacity and structure of soil, and thereby to improve plant production.  
Compiler: Gatién AGBOKOUN CHRISTOPHE 02/25/2023 5 p.m.
- 

**Dry season grazing in cropland [Benin]**  
Rotational livestock grazing is an integrated agriculture and livestock management system where livestock are grazed in the dry season, in a crop field, to feed on crop residues and/or weeds and where manure is used as an organic fertilizer for soil restoration purposes. While grazing, the animals feed on crop ...  
Compiler: Gatién AGBOKOUN CHRISTOPHE 11/24/2022 1:30 a.m.
- 

**Mucuna as a cover crop to improve soil ... [Benin]**  
Mucuna (Mucuna pruriens) is an annual herbaceous legume used as a cover crop to restore soil fertility. Beyond its nitrogen-fixing properties, its dense foliage is a living mulch that helps replenish the soil's organic matter content, capturing rainwater, protecting the soil from erosion and keeping weeds under control.  
Compilers: Gatién AGBOKOUN CHRISTOPHE 03/12/2023 2:12 a.m.
- 

**Intercropping Pigeon Pea with Maize [Benin]**  
Pigeon pea, a leguminous shrub, enhances the physical and chemical characteristics of the soil. Through symbiotic nitrogen fixation, it can fix approximately 70 kg of nitrogen per hectare per season. When intercropped with maize, pigeon pea has the potential to double both maize yields and pigeon pea grain production.  
Compiler: Gatién AGBOKOUN CHRISTOPHE 11/22/2022 1:57 p.m.

Recherche  Toutes les données de GDT


Pays:  Projet:  Institution:  Langue:


Filtres spéciaux destinés à:  Technologies de GDT  Approches de GDT


Project:


Seules les données déclarées publiques sont visibles.


Vos résultats de la recherche (87)

- 

**Agroforesterie à base de Gmelina [Benin]**  
L'établissement d'une plantation privée à base de Gmelina est une mesure de foresterie pure ou de l'agroforesterie lorsqu'il est intercalé avec des cultures, effectuer pour enrichir le sol en matière organique, favoriser la biodiversité associée et le cycle hydrologique, réduire l'érosion du sol et aussi fournir du revenu.  
Compilateur : Gatién AGBOKOUN CHRISTOPHE 4 mars 2023 20:21
- 

**Biochar [Benin]**  
Le biochar, « charbon vert », est un amendement pour améliorer la structure et la productivité du sol, produit à travers la pyrolyse (combustion) ou décomposition lente sous l'action de la chaleur de la biomasse végétale (résidus champêtres comme des rafles de maïs, résidus forestiers, etc) dans une atmosphère sans ...  
Compilateur : Gatién AGBOKOUN CHRISTOPHE 25 fév. 2023 17:00
- 

**Parcage d'animaux [Benin]**  
Le parcage rotatif des animaux est une des technologies de la Gestion intégrée de l'agriculture et de l'élevage. Il consiste à garder le bétail dans un champ agricole, pour bénéficier des résidus de récolte et/ou des adventices comme alimentation et des excréments en guise d'engrais organique pour restaurer le sol ...  
Compilateur : Gatién AGBOKOUN CHRISTOPHE 24 nov. 2022 01:30
- 

**Mucuna en culture de couverture pour améliorer la ... [Benin]**  
Le Mucuna (Mucuna pruriens) est une légumineuse herbacée annuelle que nous avons utilisée comme plante de couverture pour restaurer la fertilité du sol. En plus de sa capacité à fixer l'azote dans le sol, la bonne couverture végétale constitue un mulch épais qui contribue à restaurer la matière organique du sol, à ...  
Compilateur : Gatién AGBOKOUN CHRISTOPHE 12 mars 2023 02:12
- 

**Pois d'angole en association avec le maïs [Benin]**  
Le Pois d'Angole est une légumineuse arborescente connue pour ses possibilités dans l'amélioration physique et chimique des sols. Il peut fixer de manière symbiotique 70 kg d'azote par ha par saison jusqu'à la formation des gousses. En association avec le maïs, le pois d'Angole permet de doubler le rendement du ...  
Compilateur : Gatién AGBOKOUN CHRISTOPHE 22 nov. 2022 13:57





Brachiaria Grass Strips (Fabrice Lherbier)

### CLASSIFICATION OF THE TECHNOLOGY

**Main purpose**

- improve production
- reduce, prevent, restore land degradation
- conserve ecosystem
- protect a watershed/ downstream areas - in combination with other Technologies
- prevent soil erosion/ biodiversity
- adapt to climate change/ extremes and its impacts
- mitigate climate change and its impacts
- create beneficial economic impacts
- create beneficial social impacts

**Purpose related to land degradation**

- prevent land degradation
- reduce land degradation
- recover/restore severely degraded land
- adapt to land degradation
- not applicable

**Brachiaria Grass Strips (Madagascar)**  
 Akatanombo, Brachiaria amin'ny lina, Brachiaria amin'ny coaly, Voly manarapanina, I.

**DESCRIPTION**  
 Grass strips are spaced at regular intervals along contour lines. These strips are not ploughed in and form barriers to reduce water-induced erosion. Over time, the plots evolve natural grass cover derived from Brachiaria sp. are spaced at regular intervals along contour lines. This system is barney and is not suitable for steeply sloping plots. It can be used by all farmers, especially those with low technical implementation skills and plots from livestock.

**TECHNICAL DRAWING**  
 A grass strip should have a minimum width of 50 cm. The recommended distances between the strips are as follows:  
 For gentle slopes, a distance of around 20 m is advised.  
 On steeper slopes, it is recommended to reduce the distance between strips. Maintain a minimum distance of 10 m between strips. On the steepest slopes, the distance should be reduced to 5 m.  
 On high steep slopes, it is recommended to use fencing instead of creating grassed strips separately. The distance between two rows of Brachiaria in the same strip must not exceed 50 cm. The space between Brachiaria seedlings or plants is 20 cm, staggered.

**SLM group**

- integrated crop/livestock management
- improved ground/vegetation cover
- cross-slope measure

**Technical specifications**

A grass strip should have a minimum width of 50 cm. The recommended distances between the strips are as follows:  
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This technology protects the soil against erosion by reducing runoff and increasing infiltration. It also helps Brachiaria produce excellent fodder for cattle and the strip's lucerne hedges. These plants are also used even in the dry season. They can be a source of high-quality green matter for the manufacture of composite bioproducts, which have a high feed value and require minimal maintenance. After the initial year, for several years. Despite their merits, these strips have not been widely adopted, possibly due to limited land farmers.

**CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY**

**Market orientation**

- subsistence (self supply)
- semi-subsistence (commercial)
- commercial market

**Off-farm income**

- less than 10% of all income
- 10-20% of all income
- > 50% of all income

**Sedentary or nomadic**

- Sedentary
- Semi-nomadic
- Nomadic

**Individuals or groups**

- individual/ household
- group/ community
- cooperative
- employees (company, government)

**Area used per household**

- < 0.5 ha
- 0.5-1 ha
- 1-2 ha
- 2-5 ha
- 5-10 ha
- 10-20 ha
- 20-50 ha
- 50-100 ha
- 100-500 ha
- 500-1,000 ha
- 1,000-10,000 ha
- > 10,000 ha

**Access to services and infrastructure**

- health  poor  good
- education  poor  good
- technical assistance  poor  good
- employment (e.g. off-farm)  poor  good
- markets  poor  good
- roads and transport  poor  good
- drinking water and sanitation  poor  good
- financial services  poor  good

**IMPACTS**

**Socio-economic impacts**

- Crop production  decreased  increased
- livestock production  decreased  increased
- livestock quality  decreased  increased
- workload  decreased  increased

**Socio-cultural impacts**

- food security/self-sufficiency  increased  decreased  improved

**Ecological impacts**

- soil loss  increased  decreased  improved
- soil moisture  increased  decreased  improved
- soil salinity  increased  decreased  improved

**Off-site impacts**

- downstream flooding (landslides)  increased  decreased  improved
- downstream siltation  increased  decreased  improved



A Brachiaria grass strip (Felana Naniteina RAMALASON)

**ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS**

**Calculation of inputs and costs**

- Costs are calculated per Technology area (size and area unit: 1 hectare)
- Currency used for cost calculation: Ariary
- Exchange rate (to USD): 1 USD = 4300.0 Ariary
- Average wage cost of hired labour per day: 3000

**Establishment activities**

1. Marking out the line of grass strips (usually following contour lines approximately 20 metres apart)
2. Ploughing the soil while preserving strips of natural vegetation (Timing: frequency: August/June)
3. Planting of Brachiaria or transplanting of Brachiaria spites on the edges of the strips at 50 cm apart

**Establishment inputs and costs (per 1 hectare)**

**Specify input**

**Labour**

- Marking out the line of the grass strip
- Soil ploughing
- Sowing Brachiaria seeds

**Plant material**

- Brachiaria seeds

**Total costs for establishment of the Technology**

**Costs for establishment of the Technology in USD**

**Maintenance activities**

1. Protecting Brachiaria strips from livestock (Timing: frequency: All year round except after mowing)
2. Leaving the strips without burning or weeding them (Timing: frequency: Dry season)
3. Cutting Brachiaria (Timing: frequency: Dry season (once a year))

**Maintenance inputs and costs (per 1 hectare)**

**Specify input**

**Labour**

- Brachiaria cutting (harvesting)

**Total costs for maintenance of the Technology**

**Costs for maintenance of the Technology in USD**

**NATURAL ENVIRONMENT**

**Average annual rainfall**

- < 200 mm
- 201-500 mm
- 501-800 mm
- 801-1,000 mm
- 1,001-1,500 mm
- 1,501-2,000 mm
- 2,001-3,000 mm
- > 3,000 mm
- > 4,000 mm

**Agro-climatic zone**

- humid
- sub-humid
- semi-arid
- arid

**Slope**

- flat (0-2%)
- gentle (3-9%)
- moderate (10-19%)
- steep (20-29%)
- very steep (30-49%)
- very steep (>49%)

**Landforms**

- plateaus
- ridges
- mountain slopes
- hill slopes
- backdrops
- valley floors

**Soil depth**

- very shallow (0-20 cm)
- shallow (21-50 cm)
- moderately deep (51-80 cm)
- deep (81-120 cm)
- very deep (> 120 cm)

**Soil texture (topsoil)**

- coarse (light sandy)
- medium (sandy clay)
- fine (heavy clay)

**Groundwater table**

- no surface
- 0-5 m
- 5-10 m
- > 50 m

**Availability of surface water**

- access
- good
- medium
- poor
- no water

**COST-BENEFIT ANALYSIS**

**Benefits compared with establishment costs**

Short term returns  very negative  negative  neutral  positive  very positive

Long term returns  very negative  negative  neutral  positive  very positive

**Benefits compared with maintenance costs**

Short term returns  very negative  negative  neutral  positive  very positive

Long term returns  very negative  negative  neutral  positive  very positive

**CLIMATE CHANGE**

**Gradual climate change**

annual rainfall decrease  not well at all  not well  well  very well

**ADOPTION AND ADAPTATION**

**Percentage of land users in the area who have adopted the Technology**

- single cases/ experimental
- 1-10%
- 11-50%
- > 50%

**Of all those who have adopted the Technology, how many have done so without receiving material incentives?**

- 0-10%
- 11-50%
- 51-90%
- 91-100%

**Has the Technology been modified recently to adapt to changing conditions?**

- Yes
- No

**To which changing conditions?**

- climate change/ extremes
- changing markets
- labour availability (e.g. due to migration)

**CONCLUSIONS AND LESSONS LEARNT**

**Strengths: land user's view**

- Protection against water erosion.
- Improved soil fertility and quality
- Production of fodder for livestock in the dry season, reducing livestock mortality

**Strengths: compiler's or other key resource person's view**

**Weaknesses/ disadvantages/ risks: land user's view to overcome**

- Unavailability of Brachiaria seeds on the market Setting up nurseries where Brachiaria can be collected. These areas will serve as a source of cuttings / splits for local farmers.
- Grazing of cattle from nearby areas.

**Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view to overcome**

**REFERENCES**

**Compiler**  
 Harifidy RAKOTO RATSIMBA

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 William Critchley  
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**Date of documentation:** Oct. 24, 2022

**Resource persons**  
 FARANTSIA - land user  
 DAMY - land user  
 BEMAZARA - land user  
 Jean de Dieu JONIA - land user  
 Aurélien RAMANATSALAMA - land user

**Full description in the WOCAT database**  
[https://cat.wocat.net/en/wocat/technologies/view/technologies\\_6471/](https://cat.wocat.net/en/wocat/technologies/view/technologies_6471/)

**Linked SLM data**  
 n.a.

**Documentation was facilitated by**  
 n.a.

**Last update:** April 19, 2024

**Initiation**

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

**Project**

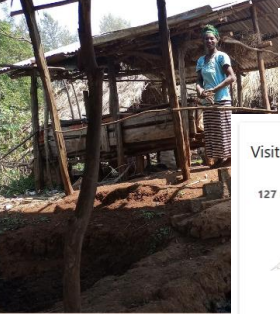
- Soil protection and rehabilitation for food security (ProSoil)

**Key references**

- Région Boeny, 2016, "Schéma Régional d'Aménagement du Territoire de la Région Boeny", Boeny Region Hotel
- GIZ ProSoil Madagascar, 2022, "Livret des Paysans Relais", GIZ ProSoil Madagascar
- GIZ ProSoil Madagascar, 2022, "Poster 'Culture de Brachiaria'", GIZ ProSoil Madagascar
- O'Huan et Al, 2008, "Brachiaria sp. B. ruziziensis, B. brizantha, B. decumbens, B. humidicola", [http://open.library.utoronto.ca/files/2/139\\_122155727.pdf](http://open.library.utoronto.ca/files/2/139_122155727.pdf)
- GRET, 2015, "Pratiques agroécologiques et agroforestières en zone tropicale humide", Fiche N°15 Bandes enherbées en zone tropicale humide/

**Links to relevant information which is available online**





A household member from Adele Biše kebele of Mattu district biogas/bioliqury production technology. (Gerba Lete)

### Integrated Soil Fertility Management

Qindoomina Misooma Gabinna Biyyee (Afaan Or)

#### DESCRIPTION

The Integrated Soil Fertility Management (ISFM) approach and Integrated Soil Fertility Management Project (ISFM+) solution to increase both crop and biomass production of varied but complementary technology promotion of varied but complementary technology.

The Integrated Soil Fertility Management (ISFM) approach and biomass production through the incremental promotion of technology packages. These include the production and use of soil acidifiers, and improved retention of crop residue. All of these are soil nutrients. One characteristic feature is the engagement of partners at all levels such as in joint problem identification, piloting technology, and exchange visits. The approach focuses on farmers with limited means to purchase their own production of organic fertilizers to increase both soil fertility and crop yield. Furthermore, ISFM enables farmers to generate off-farm income through production and sale of organic fertilizers, vermicompost, a partners assist in identifying soil-related issues, as well as institutionalization of the approach. ISFM aims to improve soil degradation issues and the necessity of SLM by creating exposure visits, collective learning, and action.

Project focal persons representing partners at different levels are used to facilitate the process and serve as potential role models. At the national level, the Farmers Research and Extension Group (FREG) implements the technologies on an incremental basis. At the district level, the Soil Fertility Improvement Cluster approach (see WOCAT) implements the approach by adopting and superimposing technology on improved compost production. Farmer ambassadors are used to support their performance. They assist in mainstreaming and promoting technologies to indirect beneficiaries. The implementation is supported by the Local Subsidy Contract.

Project staff including federal and regional advisors are involved in technical backstopping, reviewing progress, M&E, and they closely follow up on the implementation - with the support of meetings and collective learning. In addition, they assist in term demonstrations, organizing field days and exchange visits, and

**APPROACH AIMS AND ENABLING ENVIRONMENT**

**Main aims / objectives of the approach**

The main objective of the approach is to promote the integration of technologies, collective learning, and institutionalization of the approach.

**Conditions enabling the implementation of the Technology/ies applied under the Approach**

- **Availability/ access to financial resources and services:** Access to financial resources improved
- **Institutional setting:** Institutional setting such as farmers' group formation promotes collective learning
- **Collaboration/ coordination of actors:** Central to promoting effective implementation of the approach
- **Policies:** Such as adopting time production, distribution and use policy enables successful implementation
- **Workload/ availability of manpower:** Family labor enables production of organic fertilizers, and

**TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT**

The following activities or services have been part of the approach

1. Capacity building/training
2. Advisory services
3. Institution strengthening (organizational development)
4. Monitoring and evaluation
5. Research

**Capacity building/ training**

Training was provided to the following stakeholders

- Land users

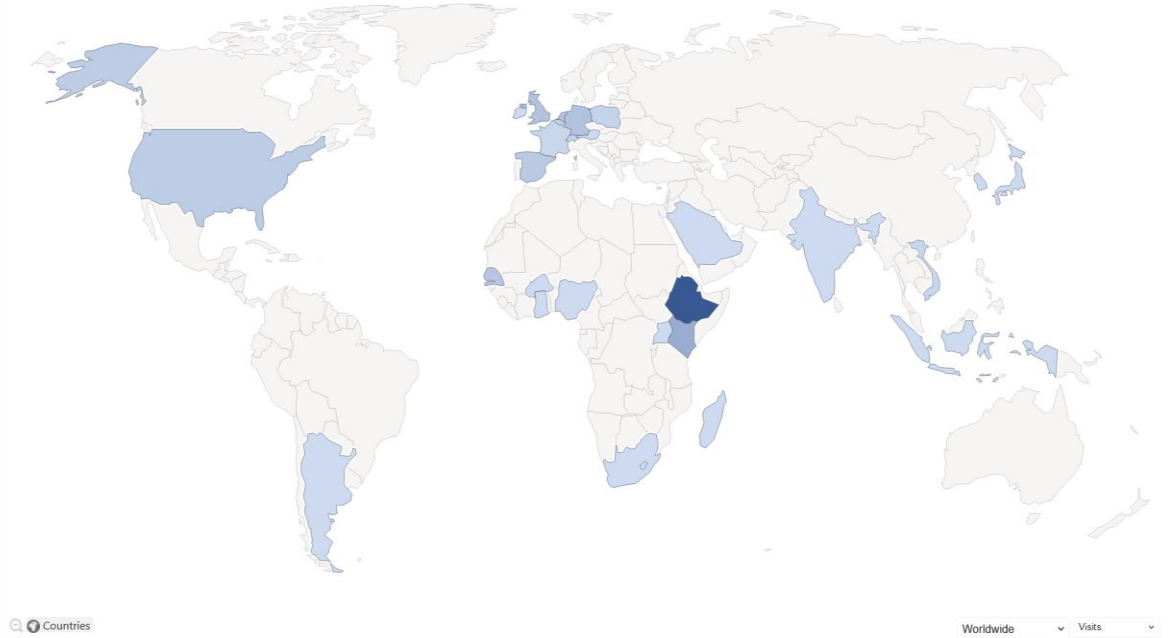
**Form of training**

- on-the-job

**Subjects covered**

#### Visitor Map

127 visits



- Did the approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies?  Yes  No
- Did the approach lead to improved food security/ improved nutrition?  Yes  No
- Did the approach improve access to markets?  Yes  No
- Did the approach lead to improved access to water and sanitation?  Yes  No
- Did the approach lead to more sustainable use/ sources of energy?  Yes  No

Question	Yes	No
Did the approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did the approach lead to improved food security/ improved nutrition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did the approach improve access to markets?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did the approach lead to improved access to water and sanitation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Did the approach lead to more sustainable use/ sources of energy?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**risks/ disadvantages/ risks: land user's view to overcome**

Integrating technologies/practices and inputs via the approach has cost implications. Promote the land user's awareness of the benefits of adopting the approach and introduction of subsidy to some inputs such as agriculture lime for acid soil remediation.

The approach drives labor-demanding technologies and practices. Promote collective action through adopting labor share arrangements as well as efficiently use family labor for follow-up of the production of organic fertilizers by task sharing.

High investment cost for some technologies is promoted by the approach. Enable land users to make the right choices of diverse technologies learned through the project and the adopted approach.

High supply of agricultural inputs such as agricultural lime encourage private sectors involvement or the agro-dealers in the supply of the agricultural inputs.

**risks/ disadvantages/ risks: compiler's or other key resource person's view to overcome**

limited scope of the project implementation sites. To try to reach out to similar landscapes with similar land degradation issues including the marginal regions. Or else, institutionalize the approach at the national level so that the public sector takes up the approach in areas with similar problems.

collaboration and collective action at local levels through the existing platform is suggested by new arrivals and other local innovative forces. Local government actors and partners need to be well aware and give due emphasis beyond considering an intervention implemented through ISFM as merely project activities that usually come and go.

**Reviewer**  
William Critchley  
Rima Mekdaschi Studer  
Sally Burrowing

update: April 26, 2024

via: Frontiers of Agricultural Science and Engineering, 7(4): 1-13, DOI: 10.15302/JASE-2023031



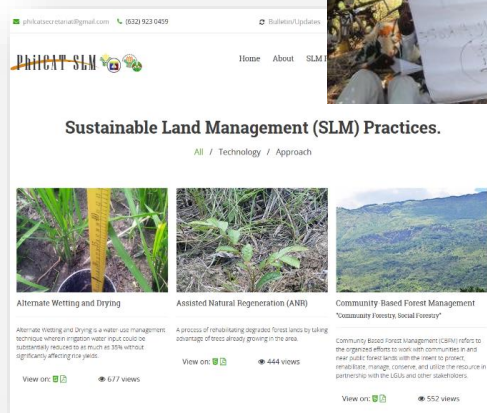
# How is the knowledge used? Comment les connaissances sont-elles utilisées ?

## Nationally and locally:

- Good practices compilations
- Learning and sharing events
- Capacity building
- Decision support for scaling

## À l'échelle nationale et locale :

- Compilations de bonnes pratiques
- Événements d'apprentissage et de partage
- Renforcement
- Aide à la décision pour la mise à l'échelle



### Sustainable Land Management (SLM)

A compilation of SLM technologies and approaches to enhance Integrated Soil Fertility Management in Ethiopia

2024



All © WOCAT

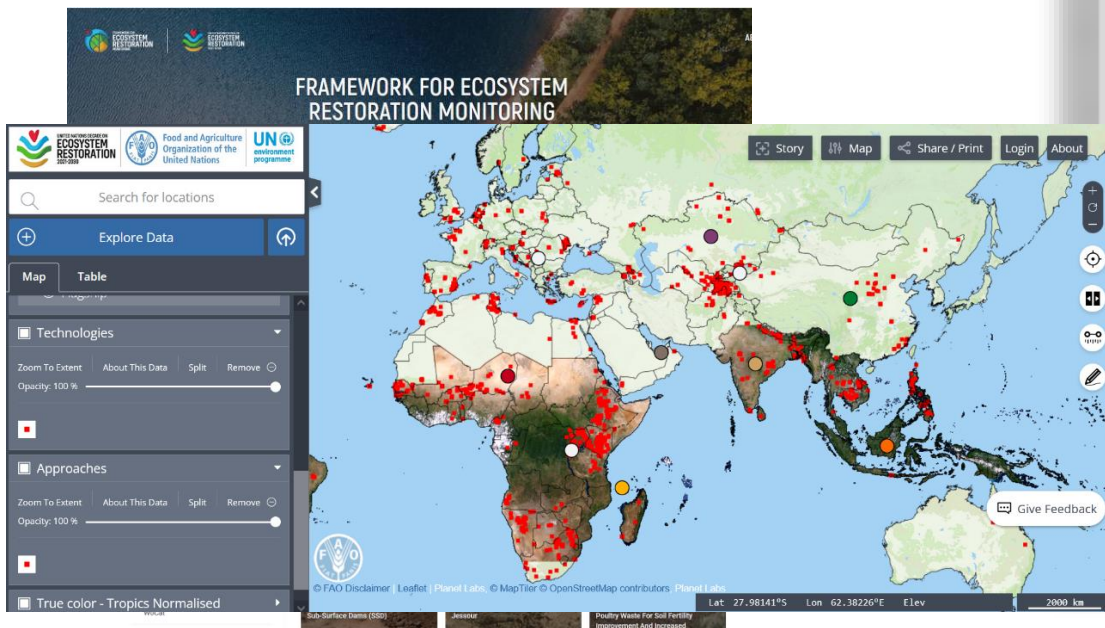
# WOCAT Database – Linked platforms

## Base de données WOCAT – Plateformes liées



WOCAT's good practices are available on various platforms, databases, and applications, **linked through the Application Program Interface (API).**

Les bonnes pratiques de WOCAT sont disponibles sur diverses plateformes, bases de données et applications, **reliées par l'interface de programmation d'application (API).**



### Linked Platforms / Databases / Applications Plateformes / bases de données / applications liées

- Framework for Ecosystem Restoration Monitoring (UNDER - FERM)
- Water Harvesting Explorer (World Bank)
- UNCCD Drought & SDS Toolbox
- FarmBetter application
- LandPKS application
- Carbon Benefit Platform
- Great Green wall Platform
- National Platforms
- *EU H2020 OPTAIN Learning Environment*
- *G20 GLI Platform*
- ...

*in progress*



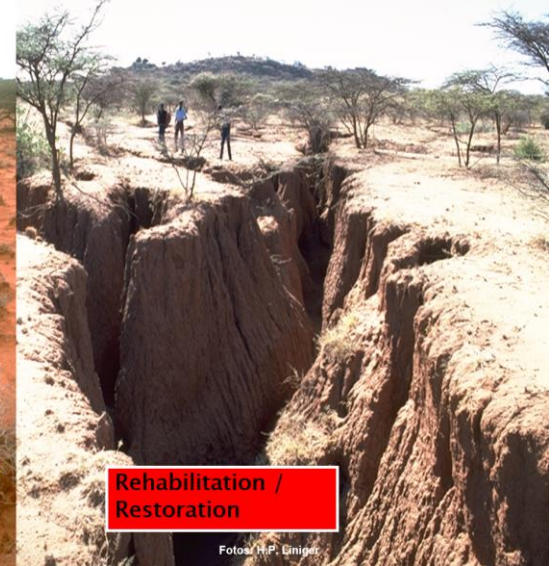
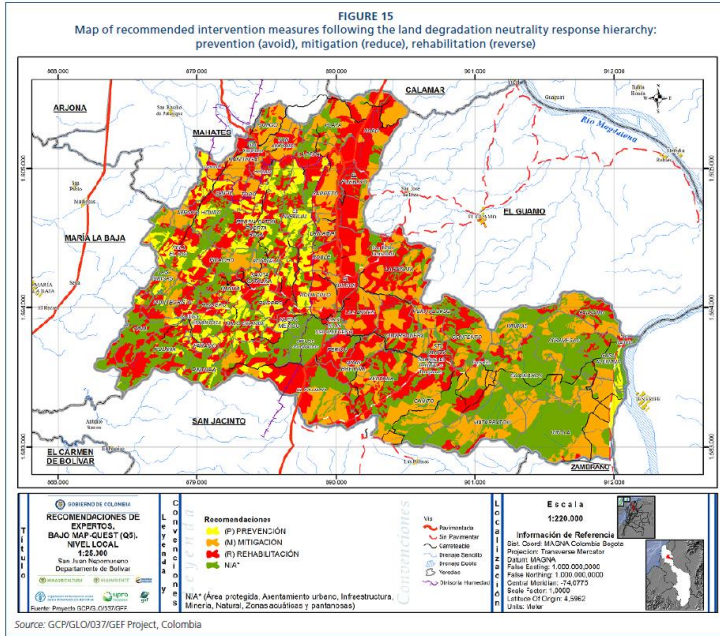
# Land Use Planning in the context of LDN

## L'aménagement du territoire dans le cadre de la NDT



### Purpose of the SLM technology

### Objectif de la technologie SLM



Prévention

Atténuation / « Cure »

Réhabilitation / Restauration



# The Decision Support System For Land Degradation Neutrality In Kenya (DSS Kenya)

**Le système d'aide à la décision pour la neutralité en matière de dégradation des terres au Kenya (DSS Kenya)**

# What is the LDN DSS Kenya?

## Qu'est-ce que le LDN DSS Kenya?



- LDN DSS Kenya is an interactive web-based application running on Google Earth Engine (GEE) and its Code Editor.
- GEE is a public **data catalog, compute infrastructure, geospatial APIs** and an interactive **app server**.
- GEE applications allows for convergence of evidence.
  - Existence of accumulated evidence on certain issues related to LD at a given location.
- GEE Applications can be used for Mapping Land Degradation Neutrality Indicators.
- DSS Kenya est une application Web interactive fonctionnant sur Google Earth Engine (GEE) et son éditeur de code.
- GEE est un catalogue de données public, une infrastructure de calcul, des API géospatiales et un serveur d'applications interactif.
- Les applications GEE permettent la convergence des preuves.
  - Existence d'une preuve accumulée sur certaines questions liées à la ML à un endroit donné.
- Les applications GEE peuvent être utilisées pour cartographier les indicateurs de neutralité en matière de dégradation des terres.

# Relevance for LDN DSS Kenya

## Pertinence pour le NDT DSS Kenya



- La dégradation des terres est un défi mondial grave
- Jusqu'à 40 % des terres de la planète sont dégradées, affectant directement la moitié de l'humanité
- Cartographier la dégradation des terres n'est pas facile:
  - Causes, processus et impacts des changements de TA dans le temps et dans l'espace.
  - Besoin de développer des cartes qui ont du sens à toutes les échelles et de surveiller la NDT.
- Besoin de cartes fiables de la dégradation des terres :
  - Prioriser les domaines pour des interventions de gestion durable des terres, en optimisant les ressources et les investissements
  - Soutenir les processus d'aménagement du territoire
  - Suivre et rendre compte des progrès accomplis dans la réalisation des objectifs et engagements nationaux en matière de NDT

- Land Degradation is a Global Severe Challenge
- Up to 40% of the planet's land is degraded, directly affecting half of humanity
- Mapping Land Degradation is not easy:
  - Causes, processes and impacts of LD changes over time and space.
  - Need to develop maps that make sense across scales and monitor LDN.
- Hence, need for reliable maps of Land Degradation to:
  - Prioritize areas for Sustainable land management interventions, optimize resources and investments
  - Support land use planning processes
  - Monitor and report progress towards LDN national targets and commitments

# GEE Applications for convergence of evidence

## Applications GEE pour la convergence des preuves



LDN Decision Support Systems  
Systèmes d'aide à la décision NDT



Used as LDN Decision Support Systems (LDN DSS) by different countries, are spatially explicit interactive tools that include datasets of each SDG Indicator 15.3.1 sub-indicator, as well as the final land degradation maps Utilisés comme systèmes d'aide à la décision en matière de NDT (SSD NDT) par différents pays, les outils interactifs spatialement explicites comprennent des ensembles de données de chaque sous-indicateur de l'indicateur 15.3.1 des ODD, ainsi que les cartes finales de la dégradation des terres

Land Productivity Dynamics Comparison tools  
Outils de comparaison de la dynamique de la productivité des terres



To compare alternative land productivity dynamics datasets and re-categorizations as well as alternative land productivity dynamics maps Comparer d'autres ensembles de données sur la dynamique de la productivité des terres et des recatégorisations ainsi que d'autres cartes de la dynamique de la productivité des terres.

Land cover transition analysis tools  
Outils d'analyse de la transition de l'occupation du sol



To compare alternative land cover datasets and re-categorizations as well as alternative land cover transition matrices Comparer d'autres ensembles de données sur l'occupation des sols et des recatégorisations ainsi que d'autres matrices de transition de l'occupation des sols.

# Kenya LDN Decision Support System

## Système d'aide à la décision NDT du Kenya



<https://wocatapps.users.earthengine.app/view/dss-kenya>

**Multi-Criteria Analysis**

**Land Cover**

- Forest
- Mangrove
- Shrubland
- Grassland
- Cropland
- Artificial
- Other land
- Wetland
- Water body

**Land Productivity Dynamics (2001-2022)**

- Declining
- Early sign of decline
- Stable but stressed
- Stable
- Increasing

**Slope in %**

- Flat: 0% - 2%
- Gentle: 2% - 5%
- Moderate: 5% - 10%
- Steep: 10% - 20%
- Very Steep: 20% - 30%
- Extremely Steep: 30% - 50%
- Exceptionally Steep: > 50%

**Soil pH**

- < -6.0
- 6.0 - 6.5
- 6.5 - 7.0
- 7.0 - 7.5
- 7.5 - 8.0
- 8.0 - 8.5
- 8.5 - >

**ISRIC WOCAT giz** Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Search places

**Layers**

- Counties
- Sub counties
- National Basins
- National Sub-basins
- Lake Baringo Basin
- Project area
- WOCAT SLM best practices
- Livelihoods
- Agro-Ecological Zones
- Soil ISC Categories
- Key Biodiversity Areas
- Protected Areas
- Aridity index
- Topography
- Slope in %
- Land Cover (ESA) 2021
- Land Productivity Dynamics (2001-2022)
- Soil Organic Carbon
- Precipitation Trend 2011-2021
- Mountains
- Net Primary Productivity 2022
- Fire index (Recurrence 2001-2021)

**Land Cover (ESA) 2021**

- Forest
- Mangrove
- Shrubland
- Grassland
- Cropland
- Artificial
- Other land
- Wetland
- Water body

SDG 15.3.1

Global LDN PRAIS4 products comparison app

**Multi-Criteria Analysis**

Land Cover transition analysis

Soil properties

ICRAF LD Assessment

**Earth Engine Apps**

**Selected area of interest**

Name: Republic of Kenya

Area: 59,421,833.18 ha.

Vegetated area: 57,977,640.99 ha.

Declining productivity: 19,847,690.52 ha. (34.23%)

Increasing productivity: 8,327,408.06 ha. (14.36%)

SOC Mean: 37.45 t/ha

SOC Stock: 2,166,633,602.13 t

Protected Area: 9,718,421.61 ha. (16.35%)

Key Biodiversity Area: 6,986,715.54 ha. (11.76%)

Mountain Coverage: 19,043,264.43 ha. (32.05%)

NPP 2022 (total): 246,040,027.52 tC

**General Charts**

**Land Cover (ESA) 2021**

- Forest
- Shrubland

31.2% 9.2% 48%

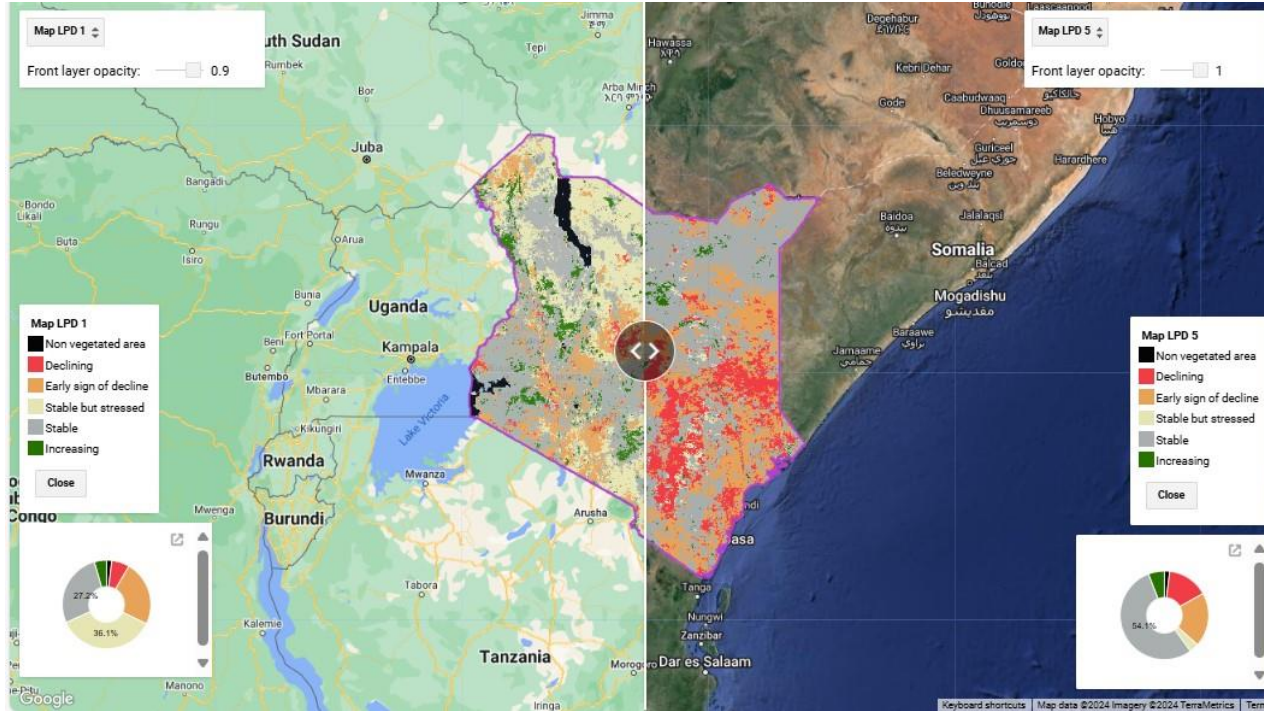
**Land Productivity Dynamics (2001-2022)**

- Declining
- Early sig...

1/3

# Land Productivity Dynamics Comparison tools

## Outils de comparaison de la dynamique de la productivité des terres



### Comparing LPD Indicators in Kenya

Click on the map to inspect NDVI and ESPI profile!

Explore different LPD maps by selecting them from the lists options.

English

Select county

Select Kenya

To compare alternative land productivity dynamics datasets and re-categorisations as well as alternative land productivity dynamics maps

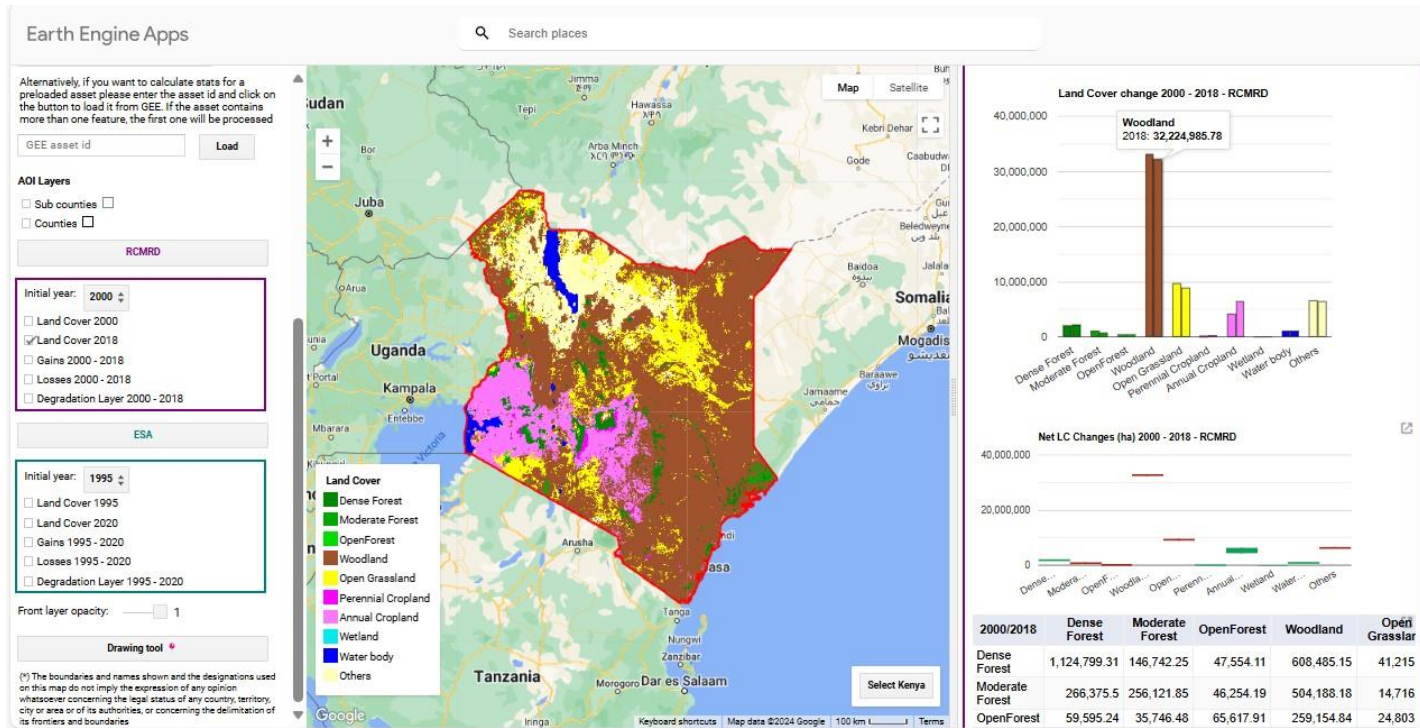
Comparer d'autres ensembles de données sur la dynamique de la productivité des terres et des recatégorisations ainsi que d'autres cartes de la dynamique de la productivité des terres.

Land productivity dynamics comparison tool Outil de comparaison de la dynamique de la productivité des terres

<https://wocatapps.users.earthengine.app/view/dss-kenya-lpd>

# Land cover transition analysis tools

## Outils d'analyse de la transition de l'occupation du sol



To compare alternative land cover datasets and re-categorizations as well as alternative land cover transition matrices / Comparer d'autres ensembles de données sur l'occupation des sols et des recatégorisations ainsi que d'autres matrices de transition de l'occupation des sols.

Land cover transitions App / Application de transitions d'occupation du sol

<https://wocatapps.users.earthengine.app/view/dss-kenya-ict>



# Potential of the LDN DSS Kenya

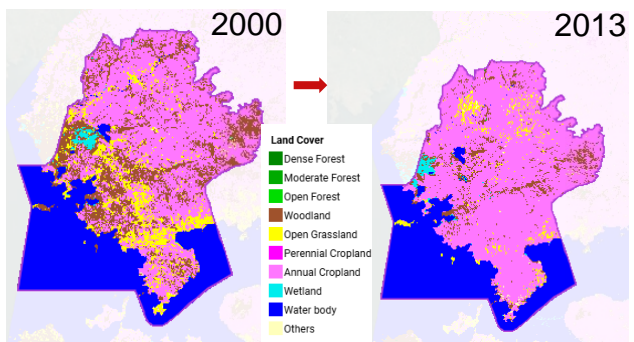
## Potential du DSS de la NDT Kenya

Can DSS Kenya measure the three sub-indicators of SDG 15.3.1?  
 Le SSD Kenya peut-il mesurer les trois sous-indicateurs de l'ODD 15.3.1?

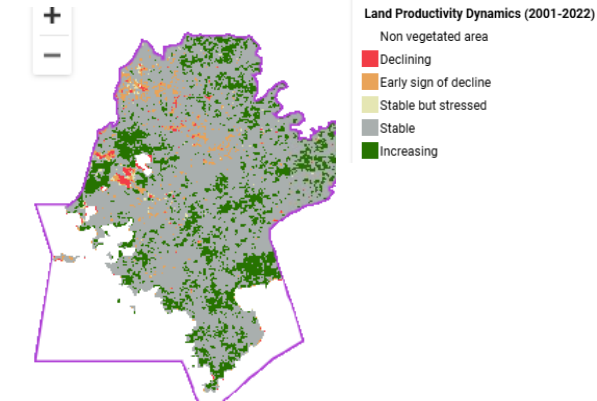


**SDG 15.3.1: Proportion of land that is degraded over total land area**  
**SDG 15.3.1: Proportion des terres dégradées par rapport à la superficie totale des terres**

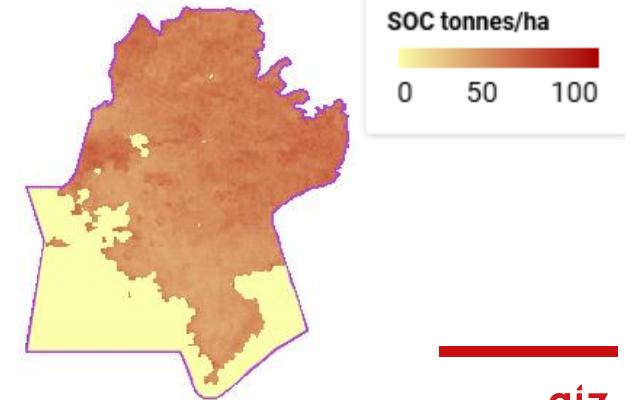
### 1. Trends in land cover Tendances de la couverture terrestre



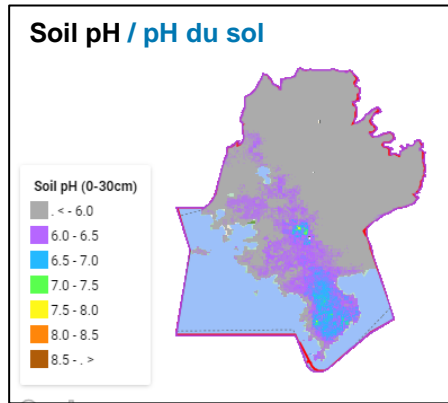
### 2. Trends in land productivity Tendances de la productivité des terres



### 3. Trends in carbon stocks Évolution des stocks de carbone

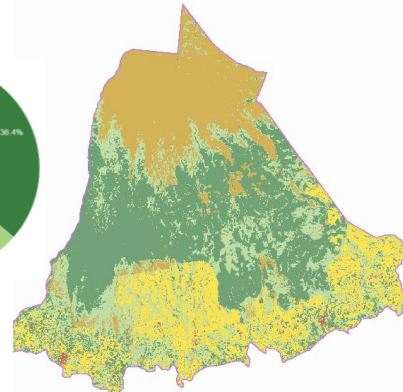
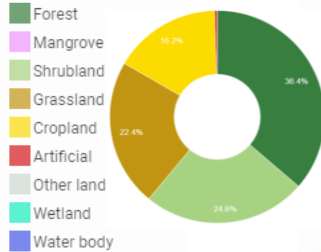


# Uses of the LDN DSS Kenya / Utilisations du DSS de NDT Kenya

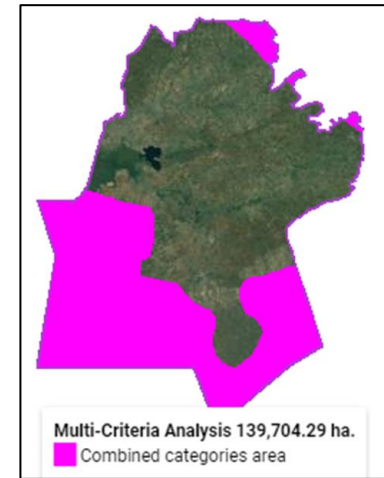


## Land cover analysis / Analyse de la couverture terrestre

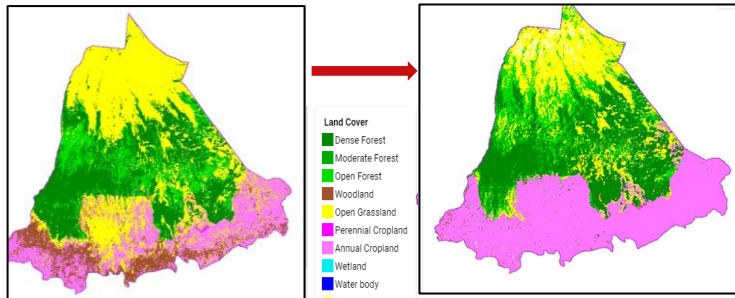
Land Cover (ESA) 2021



## Livelihood assessments / Évaluations des moyens de subsistance



## Land cover transition between 2000-2018 / Transition de l'occupation des sols entre 2000 et 2018



## Land degradation due to mining / Dégradation des terres due à l'exploitation minière



## Livelihoods

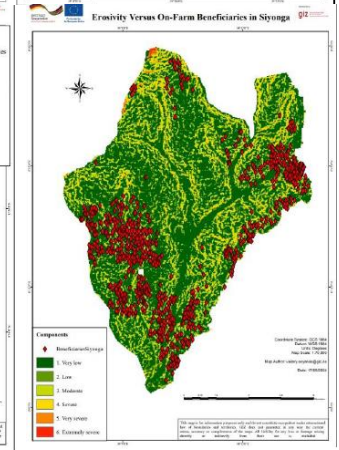
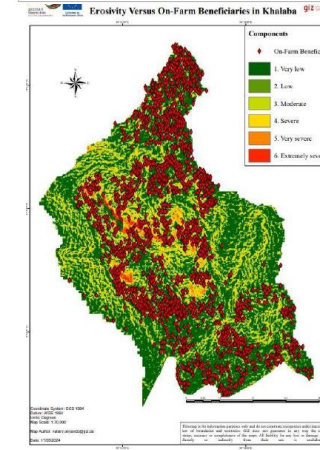
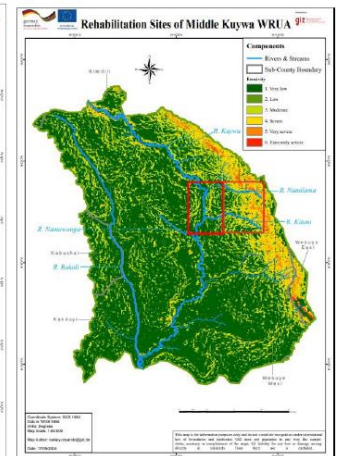
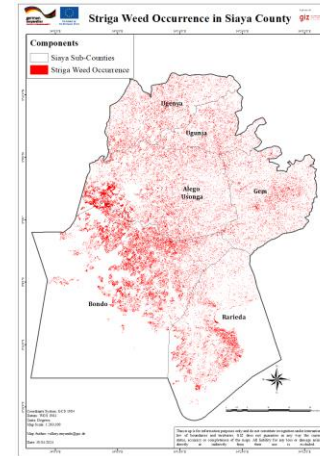
- High Potential Farming
- Medium Potential Farming
- Marginal Potential Farming
- Agropastoral
- Pastoral
- Fishing
- Riverine

# Field Experiences....

## Expériences sur le terrain....



- Informing development of agroecology strategy  
Éclairer le développement de la stratégie agroécologique
- Identification of degraded hilltops for restoration efforts  
Identification des sommets dégradés pour les efforts de restauration
- Assessment of the state of erosion and human encroachment  
Évaluation de l'état d'érosion et d'empiètement humain
- Approximating land under crops using the satellite light intensity  
Approximation des terres cultivées à l'aide de l'intensité lumineuse du satellite
- Detection of prevalent of striga weed infestation  
Détection de l'infestation de mauvaises herbes à striga.
- Assessment of erosion hotspots, land use, and land cover changes in water catchment areas  
Évaluation des points chauds, de l'utilisation des terres et des changements de couverture terrestre dans les bassins versants





# Questions & Answers

## Questions & Réponses



## 17 July – 10 am CEST

### **Institutional Anchoring and Training:**

Integration of Sustainable Land Management and Agroecology at all levels of institutions in Madagascar

## 17 Juillet – 10h CEST

### **Ancrage institutionnel et formation :**

Intégration de la Gestion Durable des Terres et l'Agroécologie à tous les niveaux d'institution à Madagascar

**Upcoming events**

//

**Événements à venir**



BILL & MELINDA  
GATES foundation



Thank you very much!  
Merci beaucoup!



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OUR FUTURE.**  
DESERTIFICATION AND  
DROUGHT DAY - 17 JUNE 2024



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**NOTRE PATRIMOINE.  
NOTRE AVENIR.**  
JOURNÉE MONDIALE DE LUTTE  
CONTRE LA DÉSERTIFICATION ET  
LA SÉCHÉRESSE - 17 JUIN 2024

Implemented by



# Contact Knowledge Nuggets // Contact Nuggets de Connaissances



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