



Food and Agriculture Organization
of the United Nations

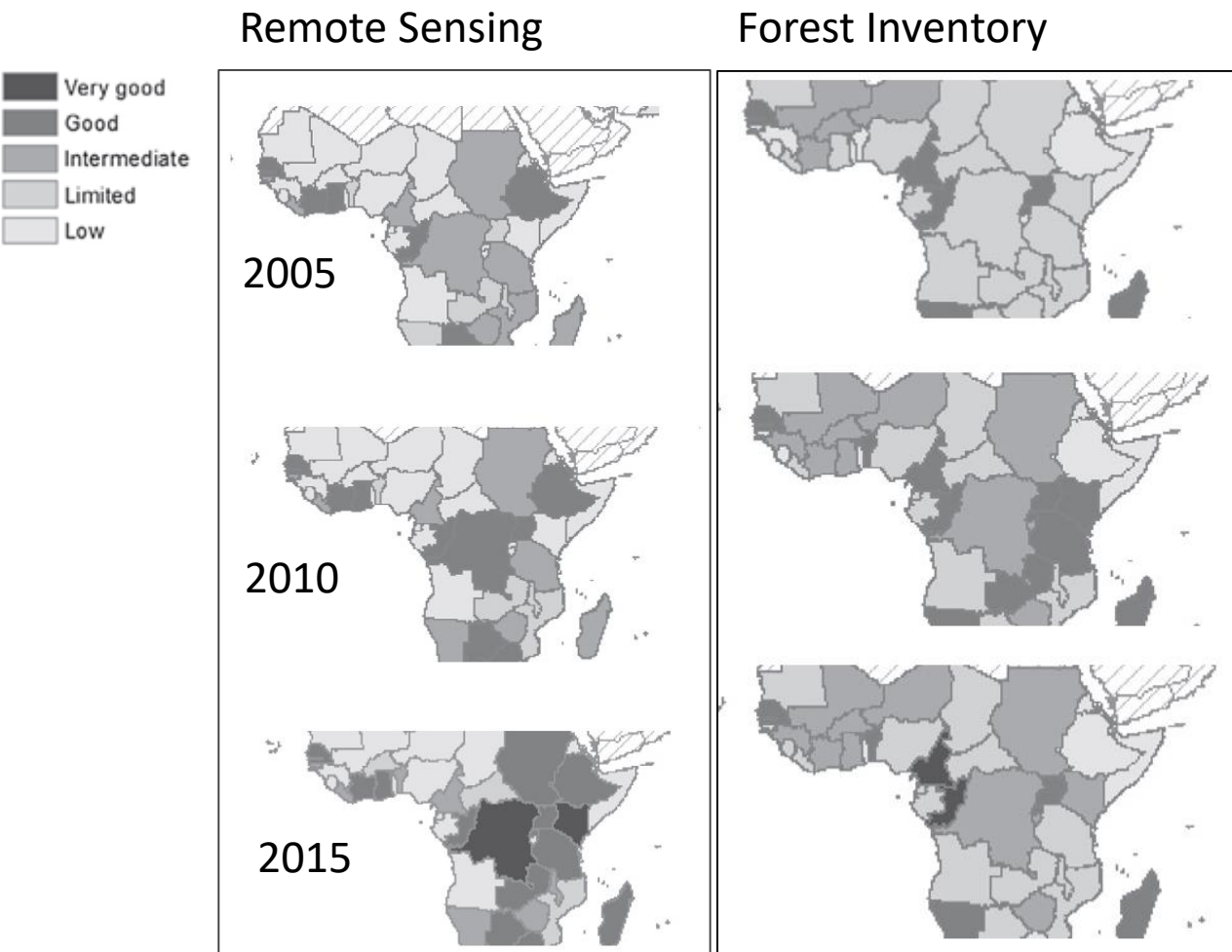
Earth observation data and products in forest monitoring

FAO, Forestry Department

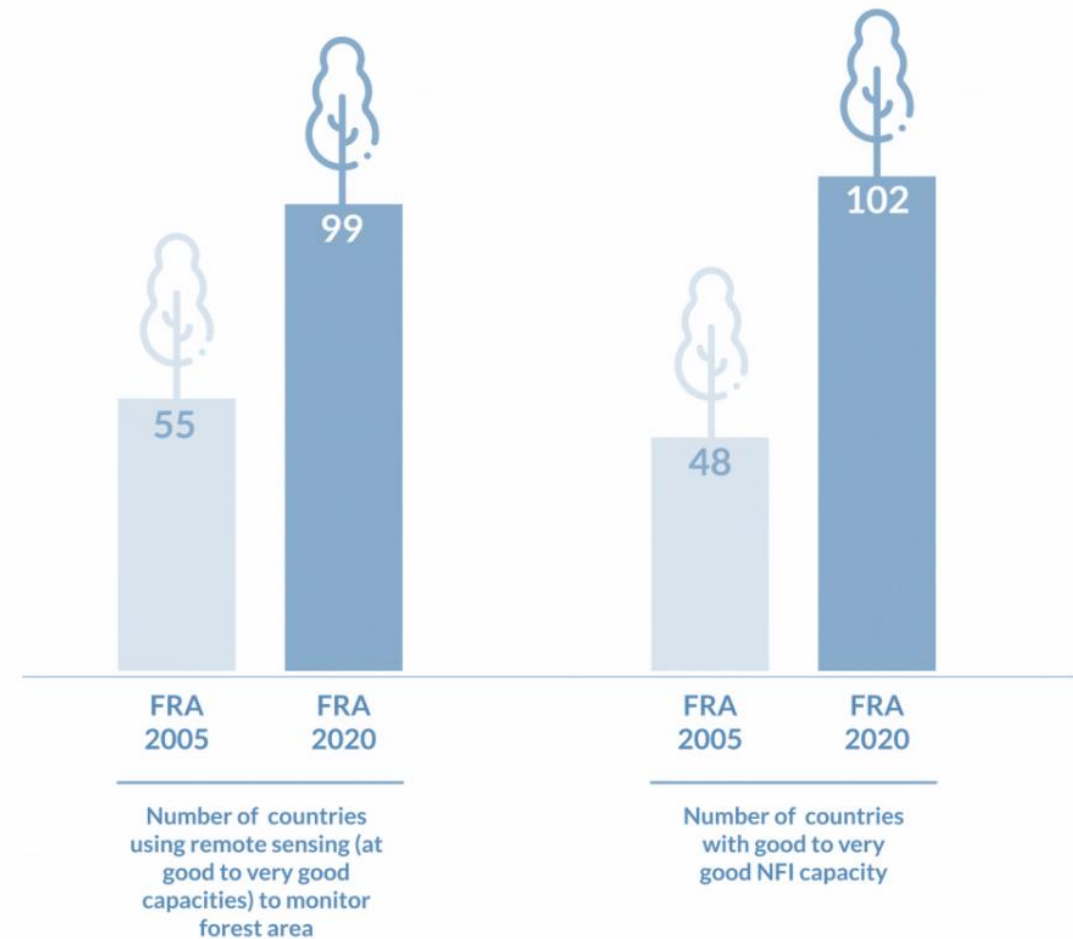
AFRICAN COMMISSION ON AGRICULTURAL STATISTICS

17 November 2021

Country monitoring gap assessments



Source: Romijn et al., (2015)



Source: Nesha et al., (2021)

Free & open-source solutions for monitoring

www.openforis.org

A set of free and open-source software tools that facilitates flexible and efficient data collection, analysis and reporting

The tools



Arena

Online platform for survey design, data management, utilization and processing



Collect

Easy and flexible survey design and data management



Collect Mobile

Intuitive data collection and validation in the field



Calc

Efficient and collaborative data analysis and results dissemination



Collect Earth

Easy and flexible survey design and data management



Collect Earth Online

Online Land Monitoring tool for crowd-sourcing of augmented visually interpreted data



Earth Map

The power of Google Earth Engine without coding. A user friendly tool for complex land monitoring



SEPAL

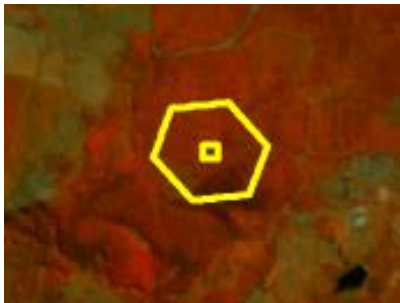
System for earth observation, data access, processing, analysis for land monitoring

Enhanced visual interpretation: [Collect Earth Online](#)

400.000 Samples, random stratified. Focus on land use changes 2000-2010 and 2010-2018

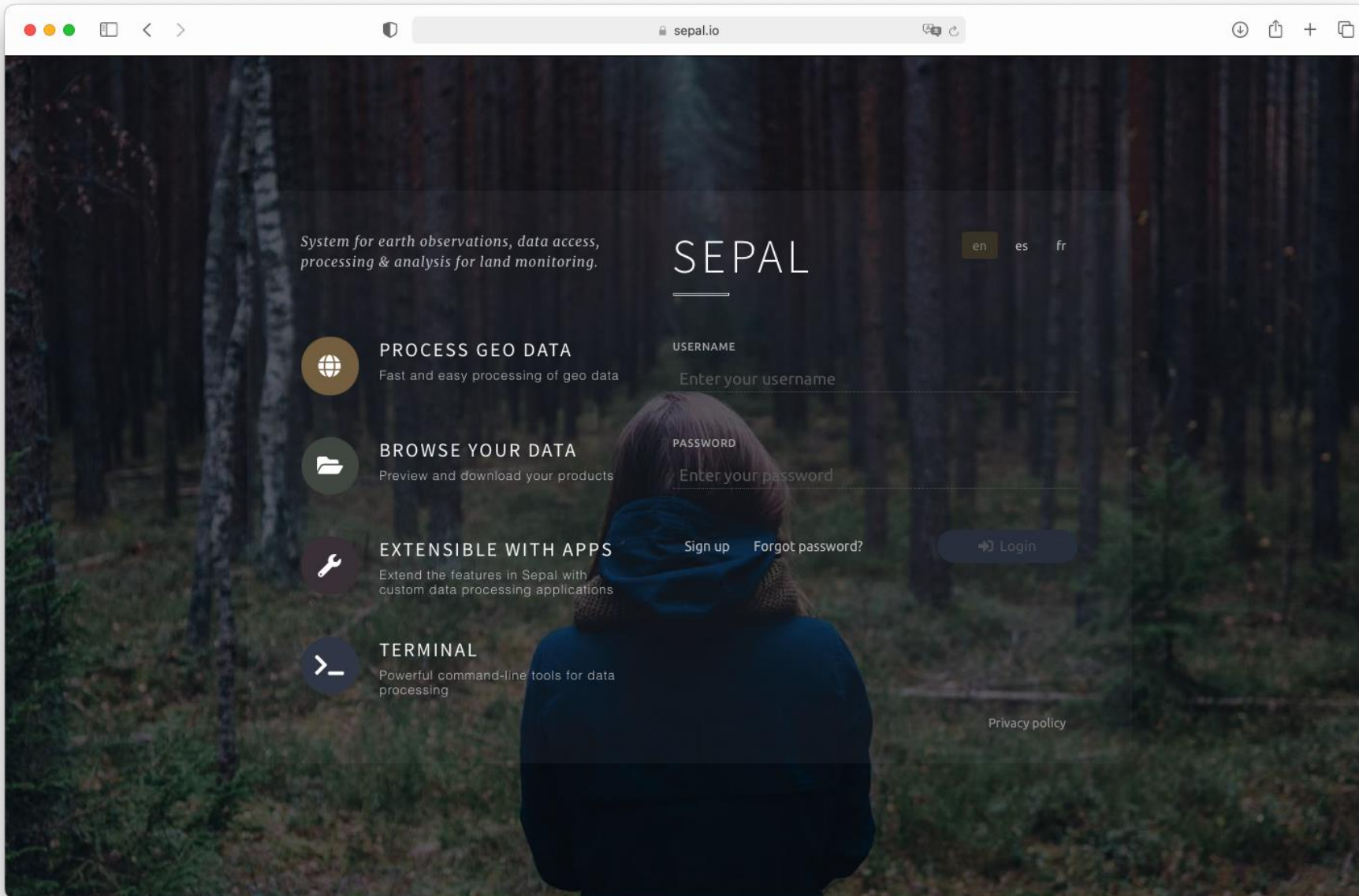
More than 800 experts of 126 countries collected the data across the world

Deforestation (2000 to 2018) was mainly due to **Cropland expansion (77%)** and **Livestock grazing (17%)**



Other wooded lands represent 13.7 % of total Africa land.

Cloud-computing at finger tips: sepal.io



Forest Inventory and Agricultural Census in Tunisia: land cover classification using Sentinel 1 time scans

SEPAL x +

sepal.io/process

PROCESS

ocs_tunisie_3qF_s2 x < > + ≡

15.3 m/px
959 m

Legend:

- IMG
- LEG
- TRN
- AUX
- CLS

Google

SEPAL ©2021

Données cartographiques ©2021 Conditions d'utilisation

\$ 0/h dannunzio

Drivers of deforestation and degradation (CAFI): <https://sites.google.com/view/cafifaoddd/>

The screenshot displays a web application interface for processing satellite imagery. The top navigation bar includes the SEPAL logo and the URL `sepal.io/process`. The main interface is divided into two panels:

- Left Panel (Processed Image):** Shows a satellite image processed into a categorical map. A legend titled "TRAITEMENT" identifies four categories: 1. Forêt (green), 2. Non Forêt (white), 3. Eau (blue), and 4. Dégradation (red). A scale bar at the bottom indicates a distance of 19.1 km. A text label at the bottom left reads "Forêt dense humide primaire sur terre ferme, >60% arboree (1)".
- Right Panel (Raw Image):** Shows the original satellite image. A settings panel titled "IMAGES COMPOSITES DE PLANET NICFI" is open, showing "COMPOSITE" set to "août 2021 - un mois" and "BANDS" set to "RGB". Other options include "AOI" and "LABELS".

The bottom of the interface features the Google logo, the SEPAL logo with a copyright notice for 2021, and a status bar showing "0/h", "dremi", and a refresh icon.

Framework for Ecosystem Restoration Monitoring

Based on FAO's Hand-In-Hand Geospatial architecture

- **Explore** geospatial information related to soil, water, vegetation, and socio-economics for your ecosystem of interest
- **Access** tools and guidance for restoration planning and monitoring
- **Upload** and integrate geospatial data locally, nationally, regionally, and globally in private work-space
- **Create** compelling restoration impact stories, based on user specific geospatial data for a defined area of interest
- **Apply** advanced functionality with integration of FAO's cloud computing platform SEPAL – *mobile compatible*



<https://data.apps.fao.org/ferm>

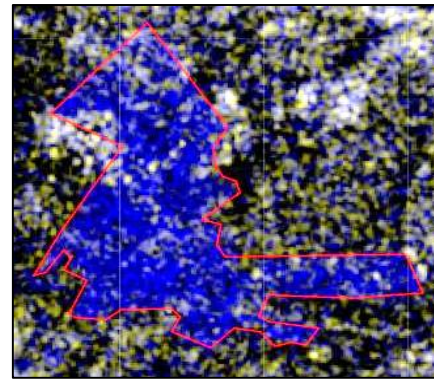
FERM User Guide : <http://www.fao.org/3/cb5046en/cb5046en.pdf>

FERM demo video: https://youtu.be/qsKtf-Q_SGg

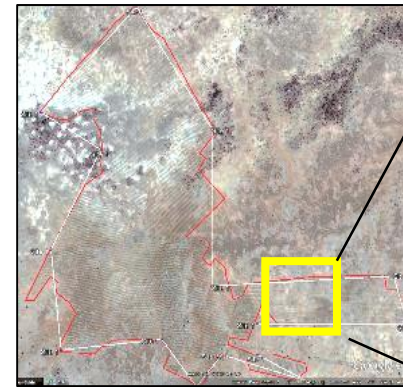


Monitoring Great Green Wall field activities

Sanpelga, Burkina Faso



Sentinel-1 radar data

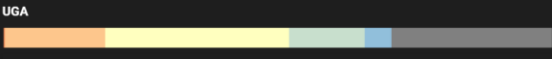


Monitor land preparation, report exact date and revise boundaries to improve measurements of areas prepared for planting

se.plan - SEPAL forest restoration planning tool

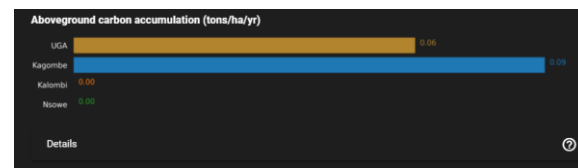
- Decision support tool for restoration practitioners.
- Focus on both **socio-economic** and **biophysical** factors
- Restoration suitability is based on a cost-benefit ratio and excludes areas where restoration cannot take place.
- An easy-to-use interface that allows for the use of global or **custom** datasets.
- A dashboard provides a map of forest restoration suitability and summary statistics.

UGA

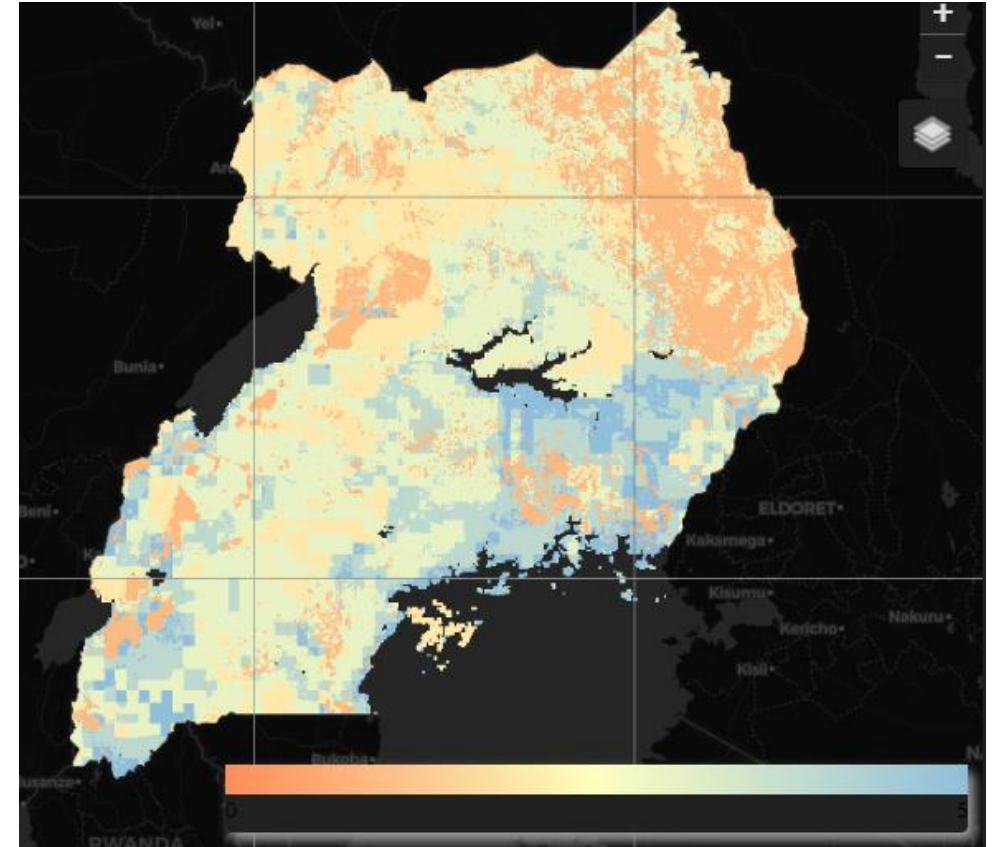


Details

restoration potential	surface (Mha)	ratio over total surface (%)
Very low	43477.3	0.2
Low	3791911.7	18.3
Medium	6951096.3	33.5
High	2867823.8	13.8
Very High	1007883.3	4.9
Unsuitable land	6090825.5	29.3



Forest restoration scenario in Uganda



Peatland monitoring in Indonesia

In degraded peatlands the creation of canals to establish crop plantations leads to water drainage and the consequent soil degradation and soil organic carbon loss. Peatland restoration consists of **blocking these canals using dams to rewet the area.**

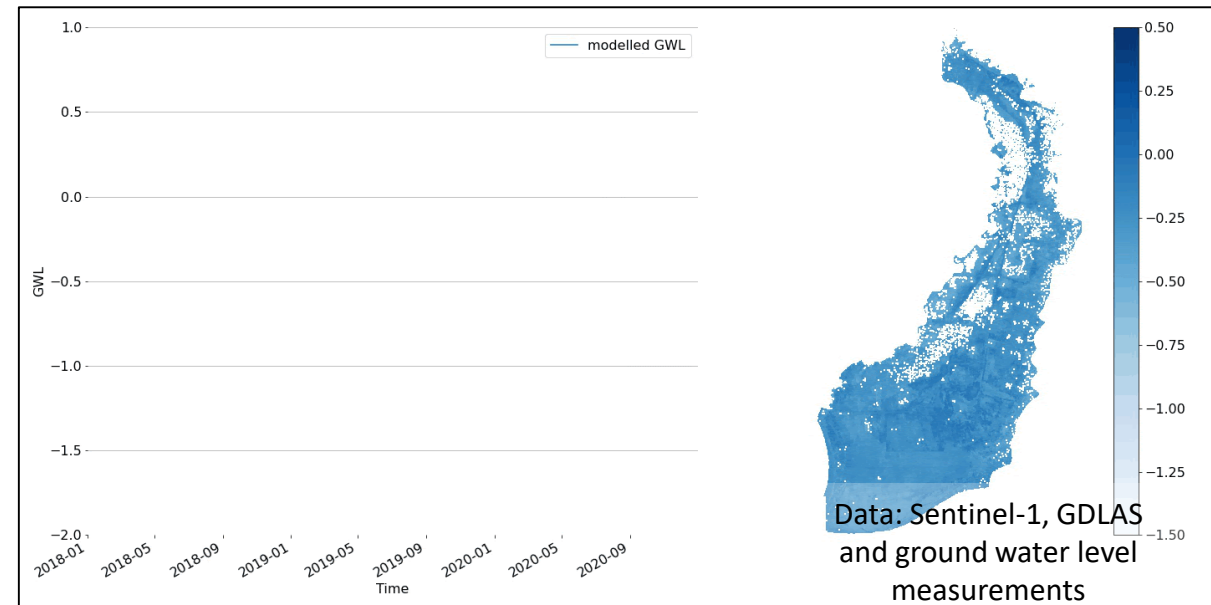


Canal dam for peatland restoration.
Source: Marcel Silvius, Wetlands International



Indonesian government peatland monitoring situation room

Ground sensors are used to collect data on **soil moisture and ground water levels** using SEPAL the data is transformed into maps that show trends in moisture and water levels in the peatlands.



More information

The screenshot shows the FAO website page for the FRA 2020 Remote Sensing Survey. The header includes the FAO logo and the text "Food and Agriculture Organization of the United Nations". A search bar with "ENHANCED BY Google" is visible. The main navigation menu includes "Background", "Past assessments", "Remote Sensing" (highlighted), "Initiatives", and "Partnerships". A sidebar on the left lists various topics: "FRA 2020 Remote Sensing Survey", "Methodology", "In Action", "Capacity development in countries", "Geospatial tools", "Support to FRA desk studies", "Global assessment of trees, forests and land use in drylands (2016)", "Global Ecological Zones (GEZ) mapping", and "Past FRA RSS Assessments". The main content area features a large satellite image of a forest landscape. Below the image, the text reads: "FRA 2020 Remote Sensing Survey. Following the recommendations from the 23rd session of the Committee of Forestry (COFO), FRA 2020 is conducting a participatory global remote sensing survey (FRA 2020 RSS) with the scope of improving estimates of forest area change at global and regional scales. The FRA secretariat, in collaboration with the Joint Research Center of the European Commission (JRC) and the FAO working group on remote sensing, has developed a worldwide methodology for the FRA 2020 RSS, which is also scalable to national assessments. The scope and the methodological design of the survey were defined on the basis of experiences, in particular from the previous FRA 2010 RSS and taking advantage from technological progress as well as from the increased availability of satellite imagery." To the right of this text is a circular progress indicator titled "INDICATORS OF PROGRESS" showing "Samples collected" and "Countries involved" with a value of "400k".

www.fao.org/forest-resources-assessment

The screenshot shows the FAO website page for National Forest Monitoring. The header includes the FAO logo and the text "Food and Agriculture Organization of the United Nations". A search bar with "ENHANCED BY Google" is visible. The main navigation menu includes "Areas of Work", "Innovative tools" (highlighted), "FERM", "Countries", "News", and "Resources". A sidebar on the left lists various topics: "FRA 2020 Remote Sensing Survey", "Methodology", "In Action", "Capacity development in countries", "Geospatial tools", "Support to FRA desk studies", "Global assessment of trees, forests and land use in drylands (2016)", "Global Ecological Zones (GEZ) mapping", and "Past FRA RSS Assessments". The main content area features a large satellite image of a forest landscape. Below the image, the text reads: "Innovative tools – Open Foris and SEPAL. Innovative open-source tools help countries measure, monitor and report on forests and land cover and use, paving the way for improved climate change mitigation plans and informed land-use policies." To the right of this text is the "OPENFORIS" logo. At the bottom of the page, there is a video player with the title "Free forestry software in the battle against climate c..." and buttons for "Watch later" and "Share".

www.fao.org/national-forest-monitoring