

mundialis



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



terrestris

HERMOSA

**Supporting the UN Decade on Ecosystem
Restoration utilizing Geo- and Remote
Sensing Technologies**

mundialis facts

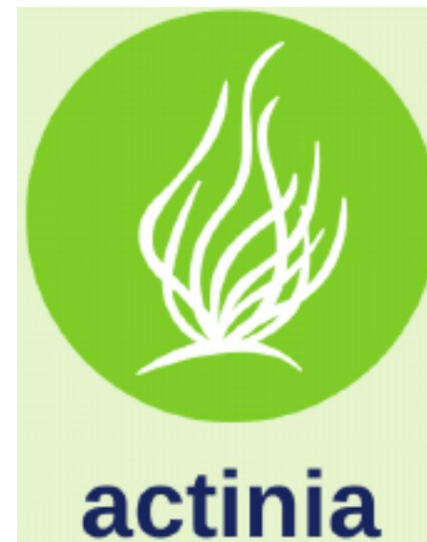


- Founded 2015, headquartered in Bonn, Germany
- Focus on remote sensing data analysis
- Usage of and programming of Free and Open Source Software (FOSS)
- Close co-operation with terrestriis

Open Source Stack



GRASS GIS

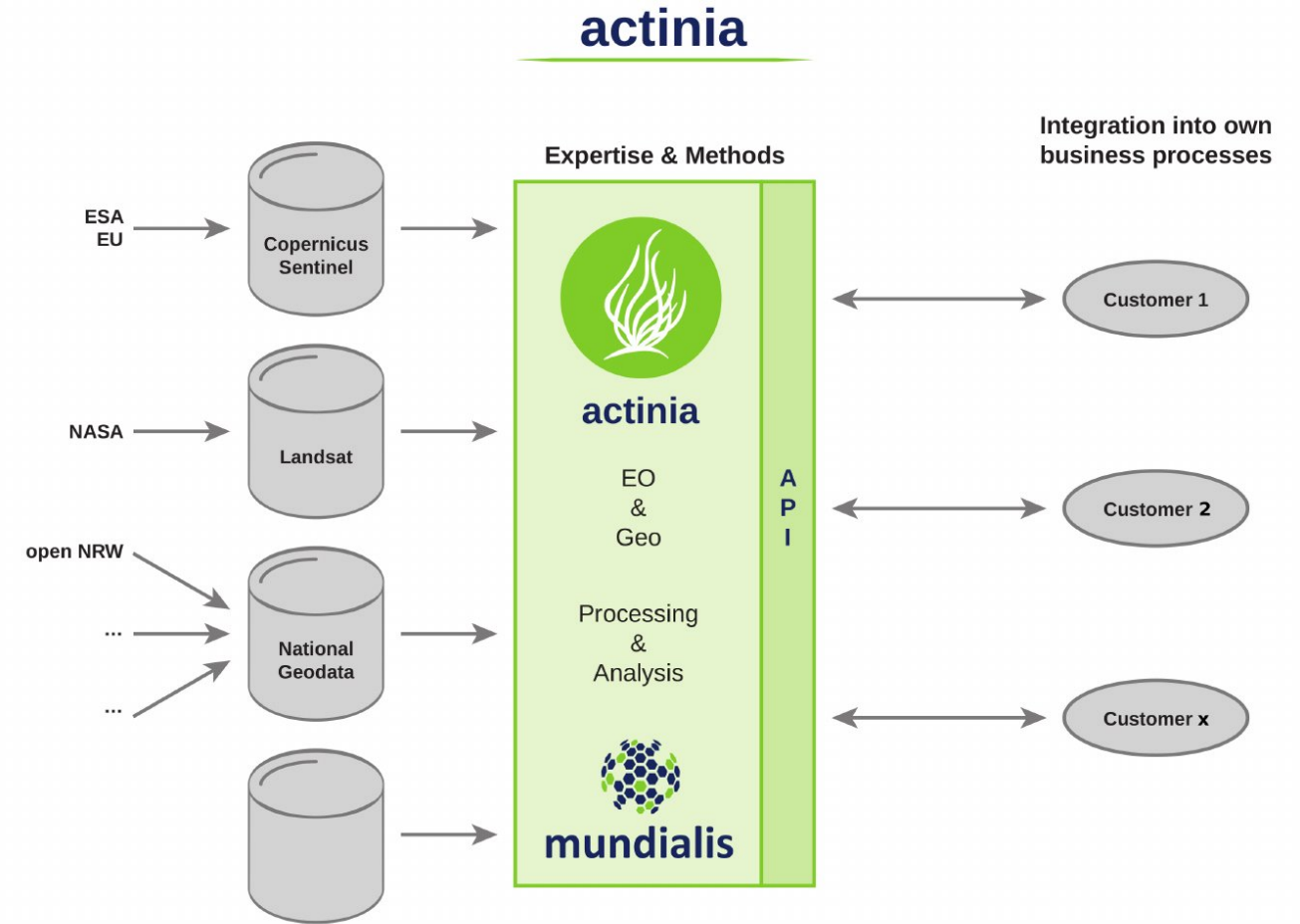


kubernetes



actinia - geoprocessing engine

- Processing of massive data
- Cloud based
- Scalable
- Focus on spatial and temporal analyses
- Use of EO archives e.g. Sentinel



<https://actinia.mundialis.de/>

The world is burning – literally.



**The climate is changing and
there is either too little water**



... or too much.



**Damages
caused by
natural
disasters are
increasing**





**... and humankind
is engaged in
unsustainable
practices
destroying
ecosystems.**



[Home](#) / [News and Stories](#) / [Press release](#)

01 MAR 2019 | [PRESS RELEASE](#) | [ECOSYSTEMS AND BIODIVERSITY](#)

On March 01st 2019 the United Nations declared 2021 to 2030 the Decade on Ecosystem Restoration

New UN Decade on Ecosystem Restoration offers unparalleled opportunity for job creation, food security and addressing climate change

Through the German contribution to ESA by DLR, mundialis was awarded a contract in July 2019 for a 2 year demonstration project called

Holistic Ecosystem Restoration Monitoring, repOrting, Sharing and mArketplace

for short - **H E R M O S A**

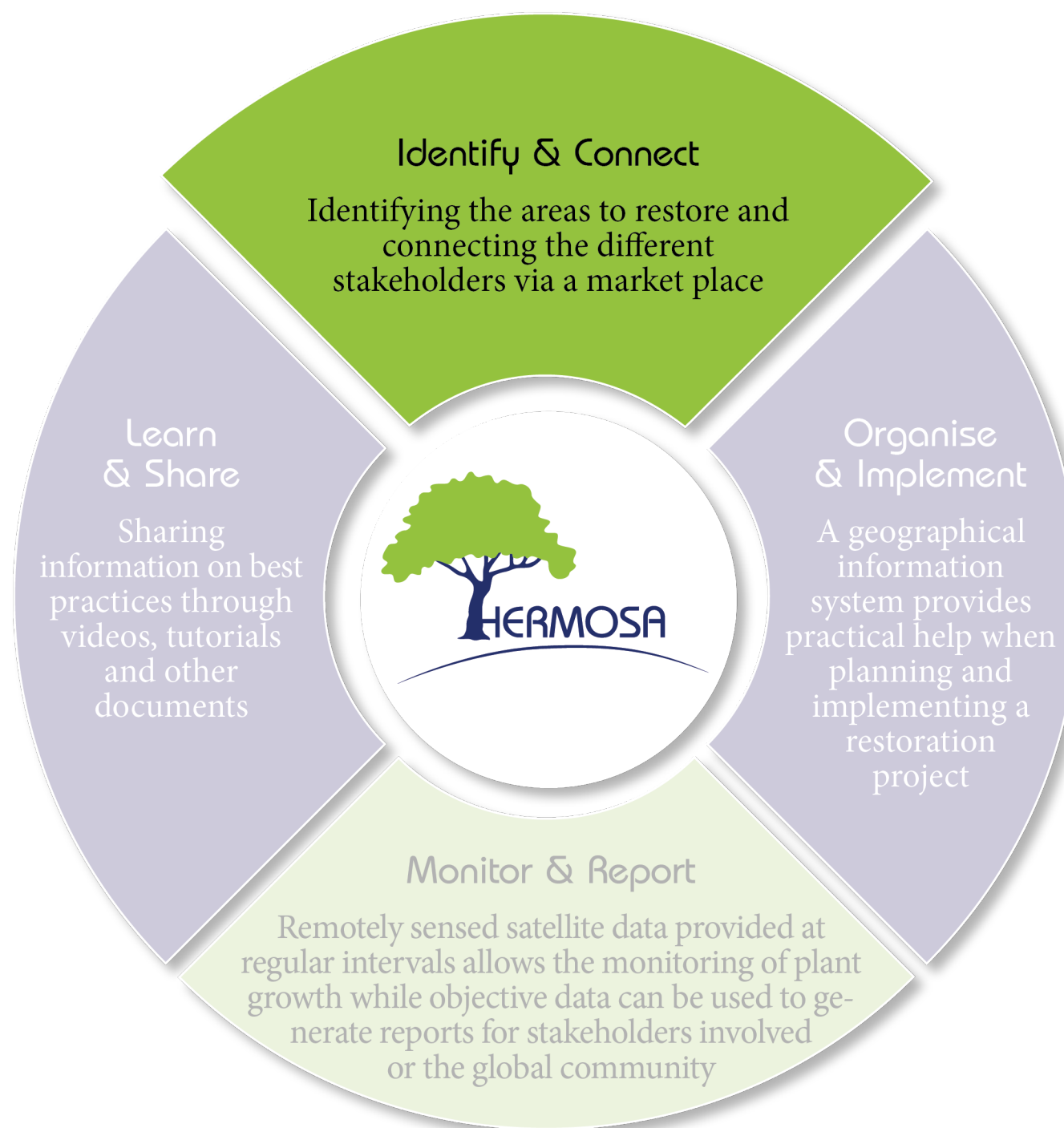


HERMOSA is a web-based application located at <https://hermosa.earth>

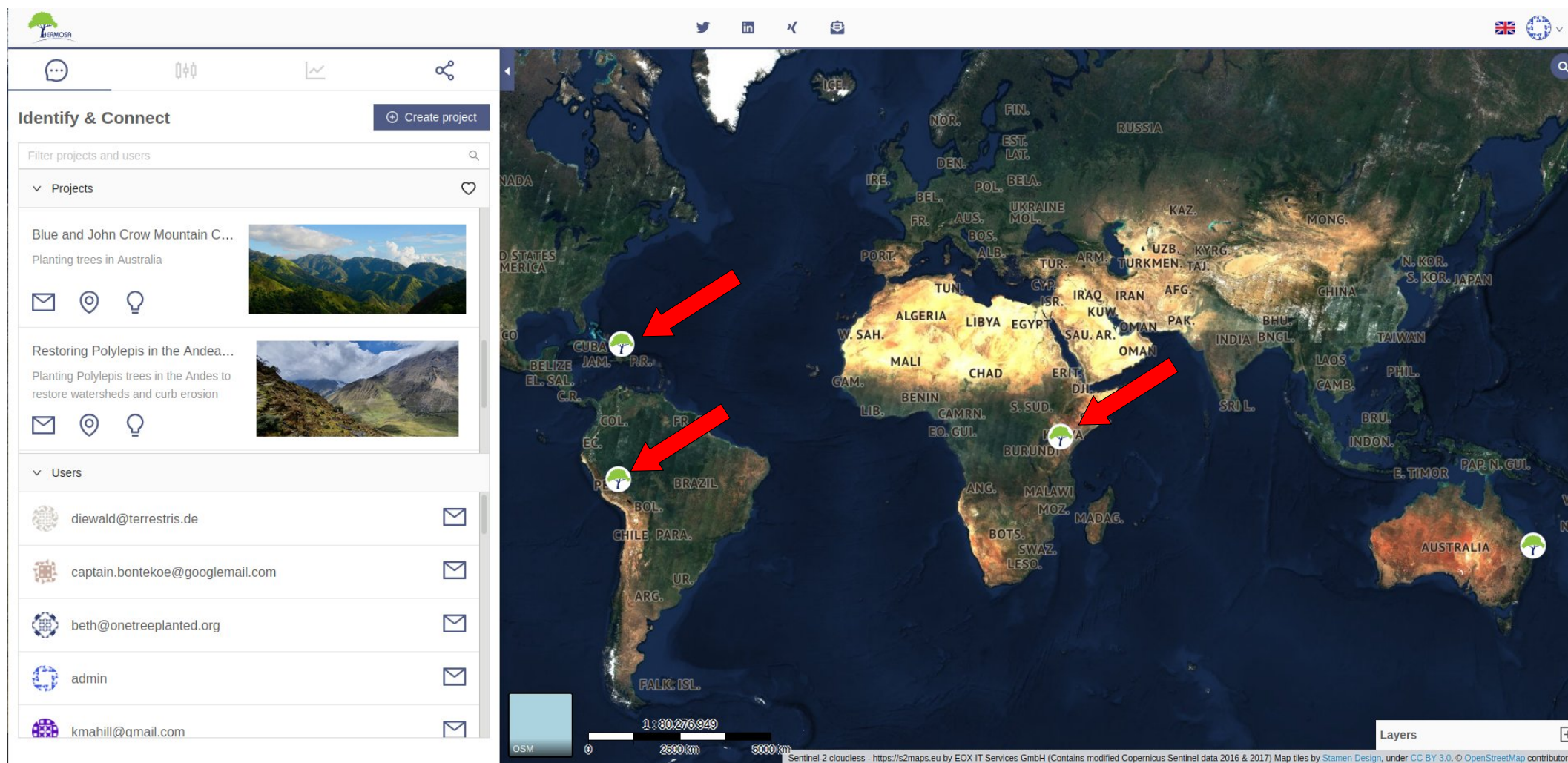
 Remember me

Not registered? [Create an account](#)



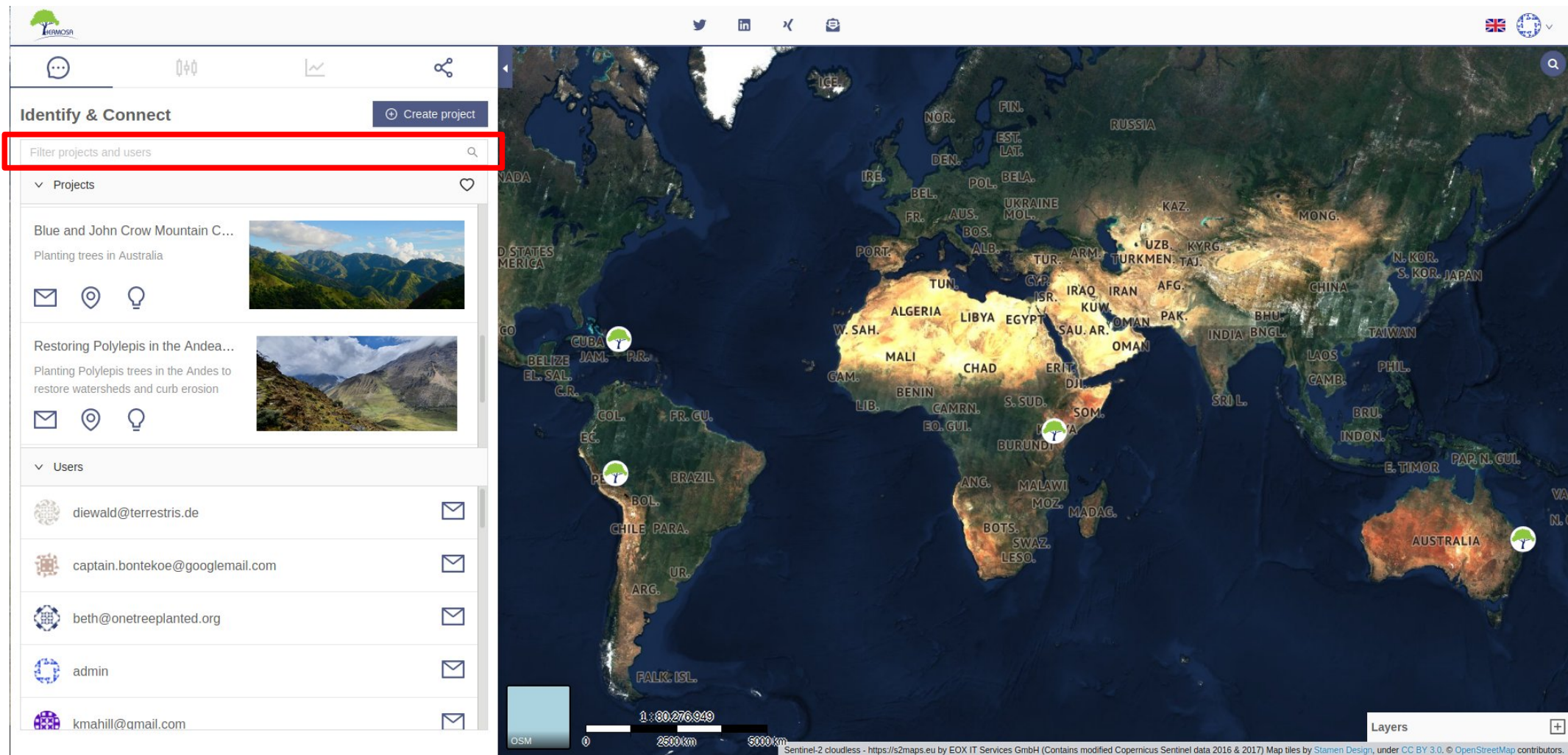


Identify projects on the map

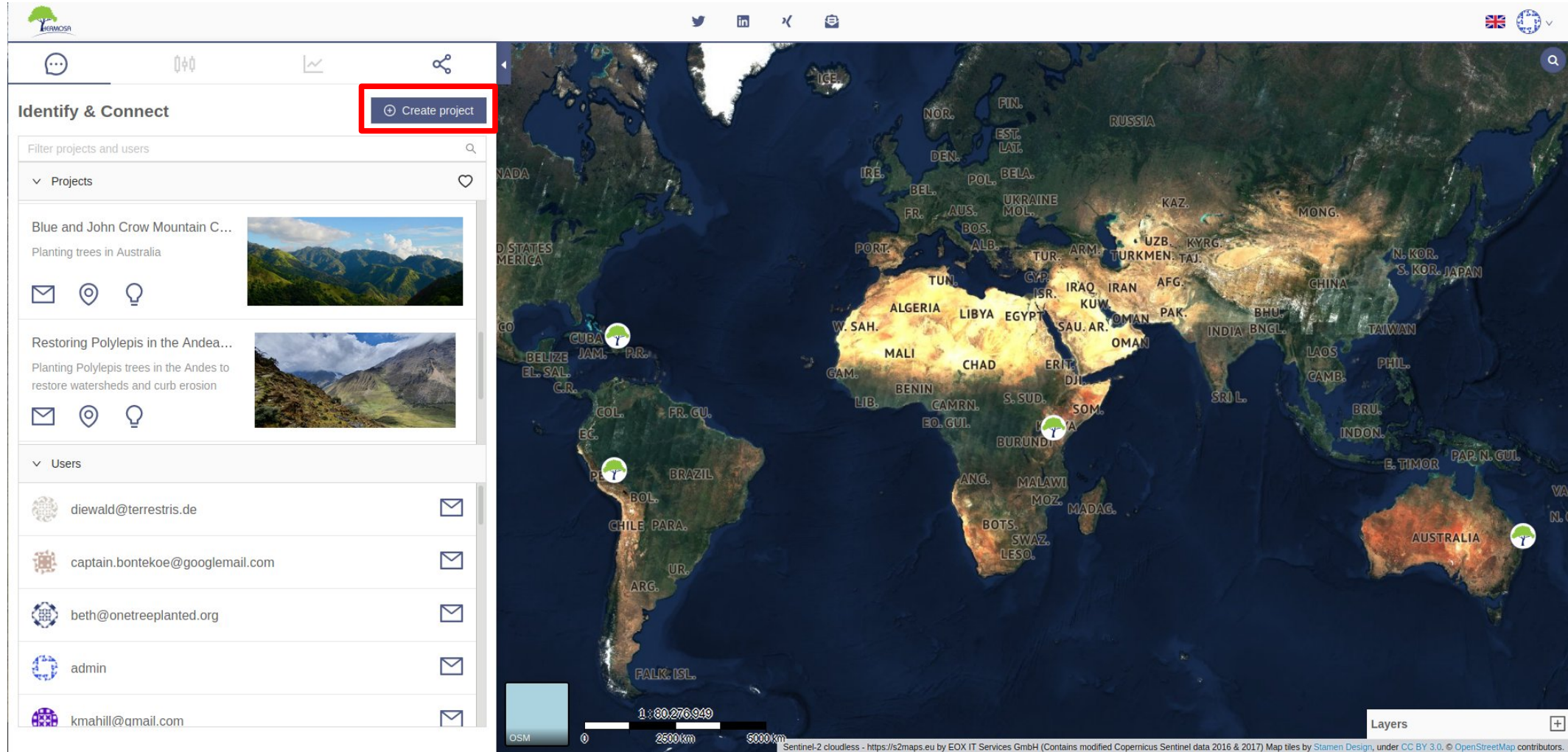


The screenshot displays the HERMOSA web application interface. On the left, a sidebar titled "Identify & Connect" features a "Create project" button and a search bar for filtering projects and users. Below the search bar, there are two project cards: "Blue and John Crow Mountain C..." with a photo of mountains and the description "Planting trees in Australia", and "Restoring Polylepis in the Andea..." with a photo of a mountain valley and the description "Planting Polylepis trees in the Andes to restore watersheds and curb erosion". A list of users is shown below, including "diewald@terrestris.de", "captain.bontekoe@googlemail.com", "beth@onetreepanted.org", "admin", and "kmahill@gmail.com". The main area is a world map with several tree icons indicating project locations. Three red arrows point to these icons: one in North America (USA), one in South America (Brazil), and one in East Africa (Kenya). The map includes a scale bar (1:80,276,949) and a "Layers" panel at the bottom right.

Filter projects and users and easily connect with them

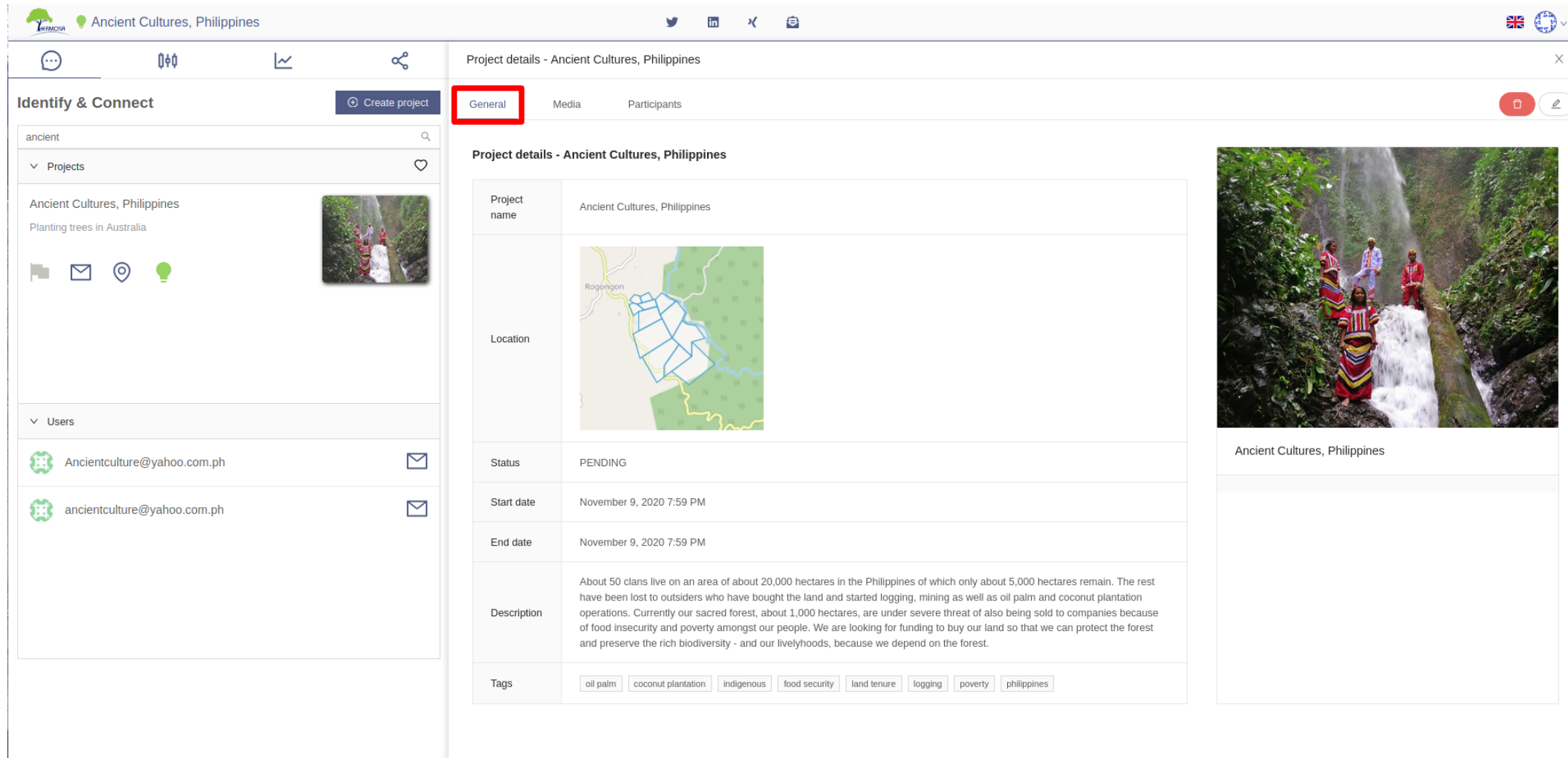


Create projects of your own to let the world know about them

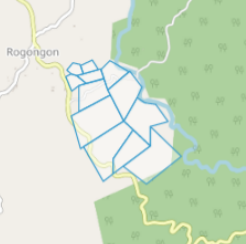


The screenshot displays the mundialis web application interface. On the left, a sidebar titled 'Identify & Connect' features a 'Create project' button highlighted with a red box. Below this, there are sections for filtering projects and users, and a list of existing projects with thumbnail images and descriptions. The main area shows a world map with several tree icons indicating project locations. The interface includes a top navigation bar with social media icons and a language selector, and a bottom section with a scale bar and map controls.

Add general information like name, location, status and description

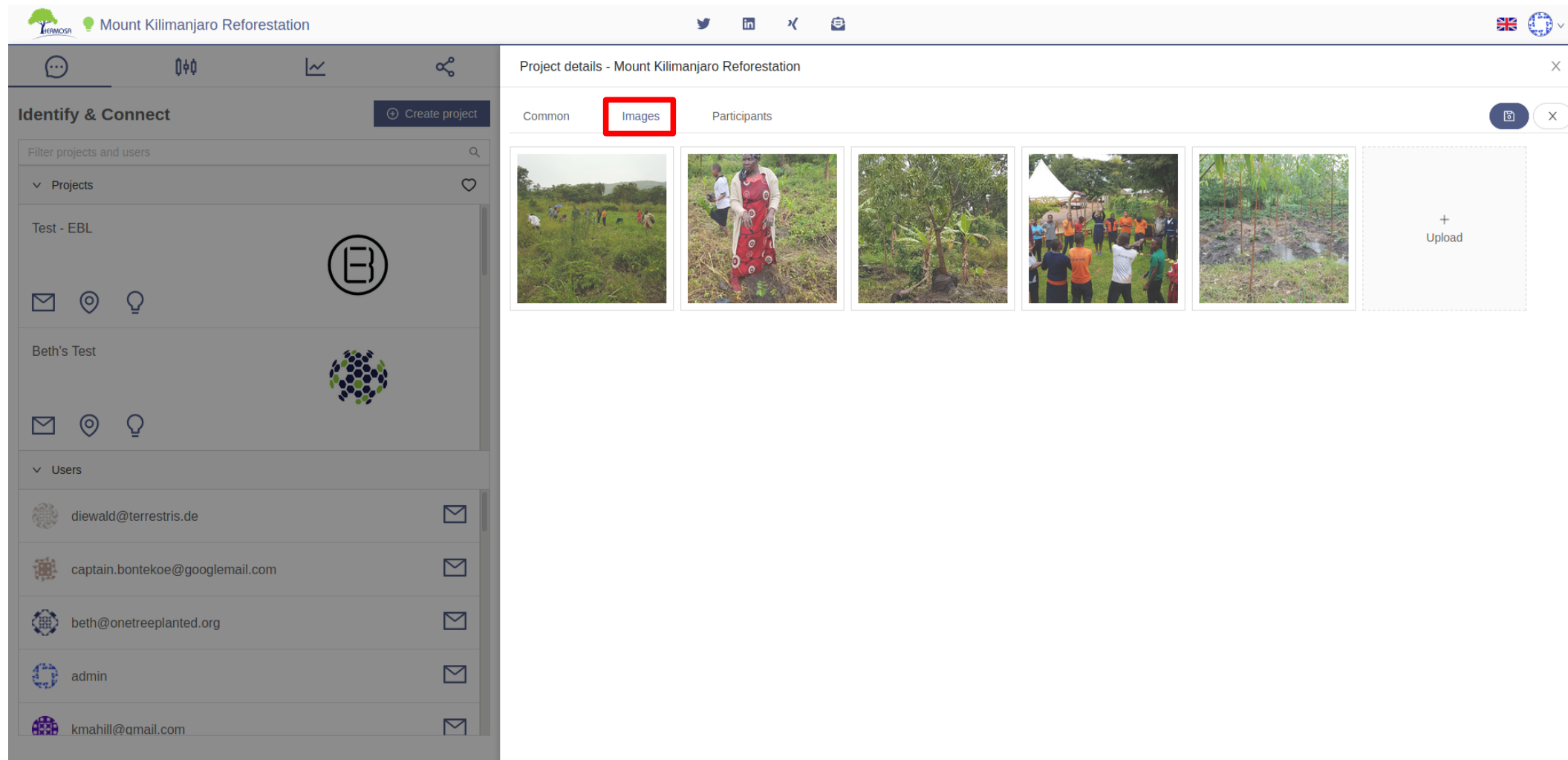


The screenshot shows the 'Project details' page for 'Ancient Cultures, Philippines'. The 'General' tab is selected and highlighted with a red box. The page displays the following information:

Project details - Ancient Cultures, Philippines	
Project name	Ancient Cultures, Philippines
Location	
Status	PENDING
Start date	November 9, 2020 7:59 PM
End date	November 9, 2020 7:59 PM
Description	About 50 clans live on an area of about 20,000 hectares in the Philippines of which only about 5,000 hectares remain. The rest have been lost to outsiders who have bought the land and started logging, mining as well as oil palm and coconut plantation operations. Currently our sacred forest, about 1,000 hectares, are under severe threat of also being sold to companies because of food insecurity and poverty amongst our people. We are looking for funding to buy our land so that we can protect the forest and preserve the rich biodiversity - and our livelihoods, because we depend on the forest.
Tags	oil palm coconut plantation indigenous food security land tenure logging poverty philippines

On the right side of the page, there is a photo of people in traditional attire near a waterfall, with the caption 'Ancient Cultures, Philippines' below it.

Add images or videos



The screenshot displays the HERMOSA project management interface for the 'Mount Kilimanjaro Reforestation' project. The interface is divided into two main sections: a left sidebar and a main content area.

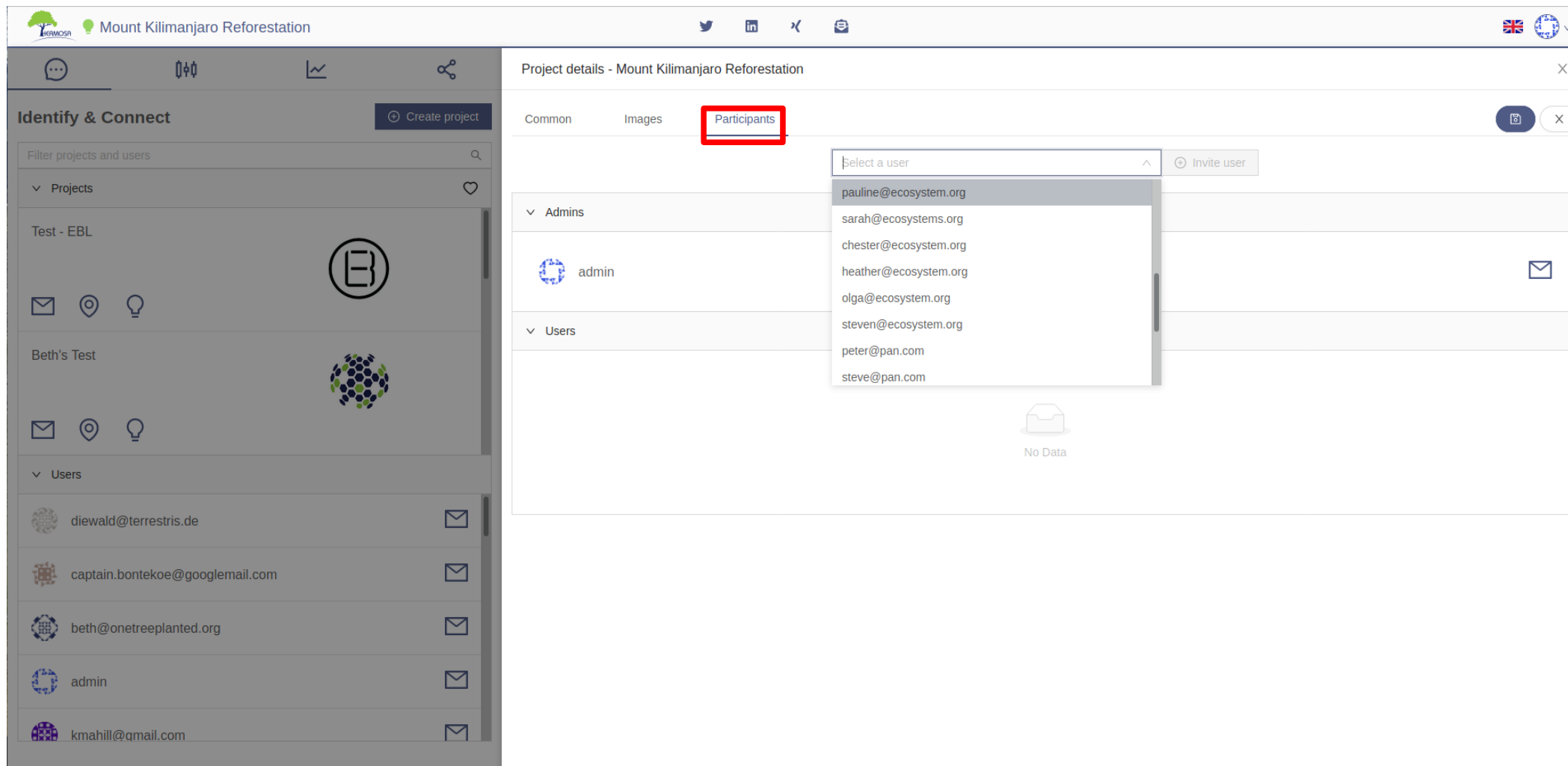
Left Sidebar (Identify & Connect):

- Header: Identify & Connect, with a 'Create project' button.
- Filter projects and users: Search bar.
- Projects section:
 - Test - EBL: Includes icons for email, location, and a lightbulb, and a profile icon with the letter 'B'.
 - Beth's Test: Includes icons for email, location, and a lightbulb, and the mundialis logo.
- Users section:
 - diewald@terrestris.de
 - captain.bontekoe@googlemail.com
 - beth@onetreepanted.org
 - admin
 - kmahill@gmail.com

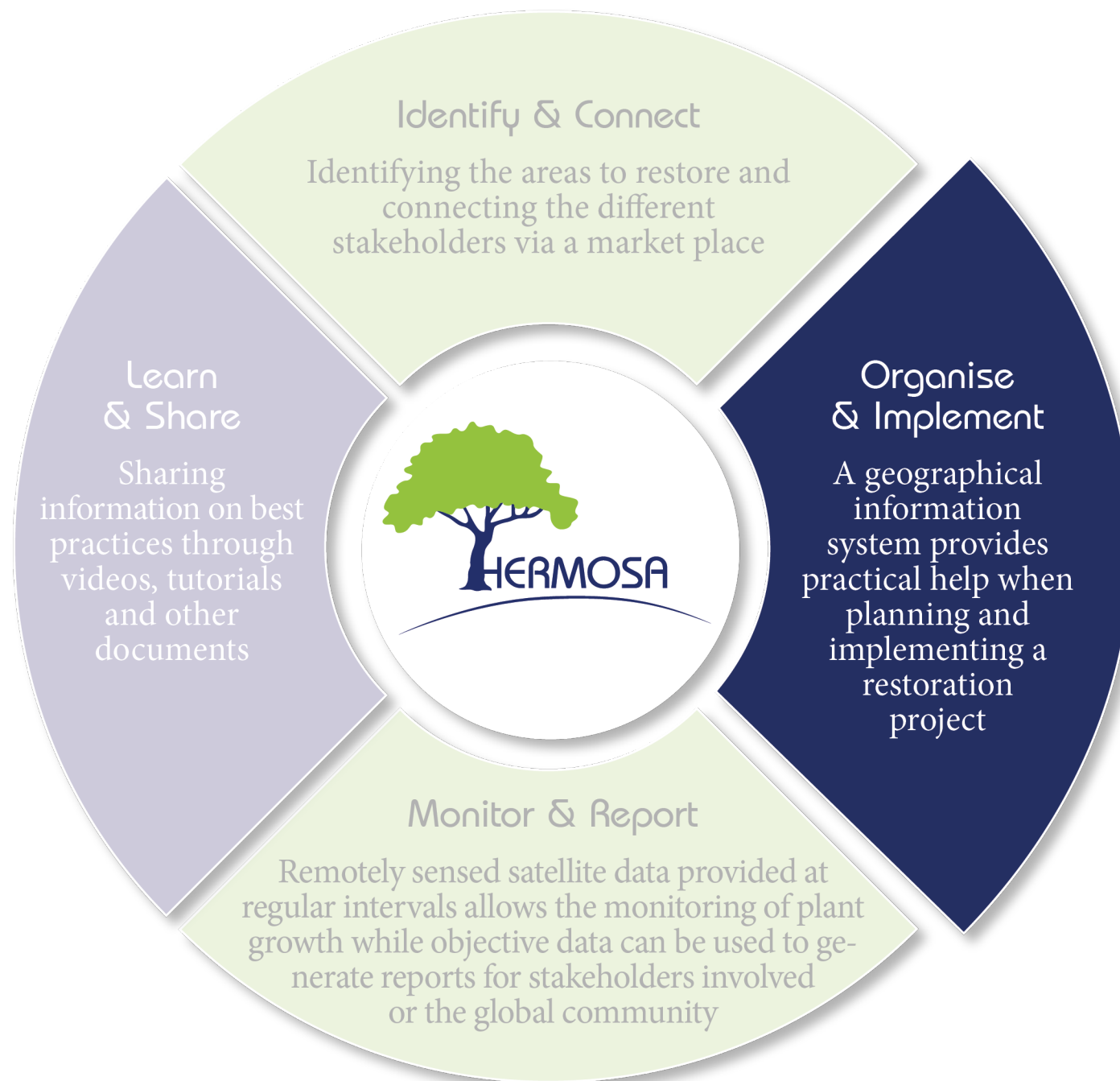
Main Content Area (Project details - Mount Kilimanjaro Reforestation):

- Navigation tabs: Common, **Images** (highlighted with a red box), Participants.
- Image gallery:
 - Five thumbnail images showing reforestation activities: a field of young trees, a woman in a red patterned dress, a young tree, a group of people, and a tree in a field.
 - An 'Upload' button with a plus sign and the text '+ Upload'.

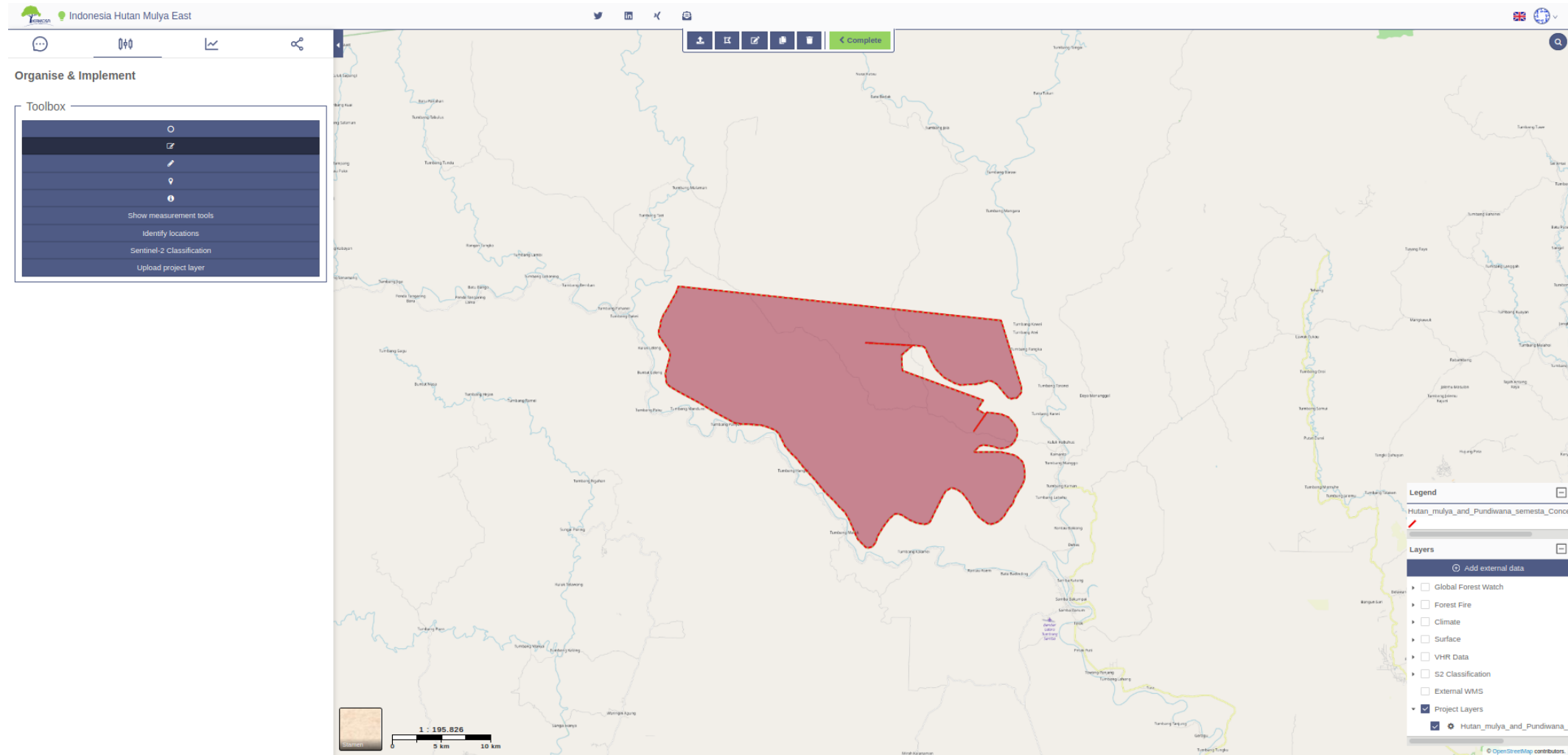
Connect with other users of HERMOSA



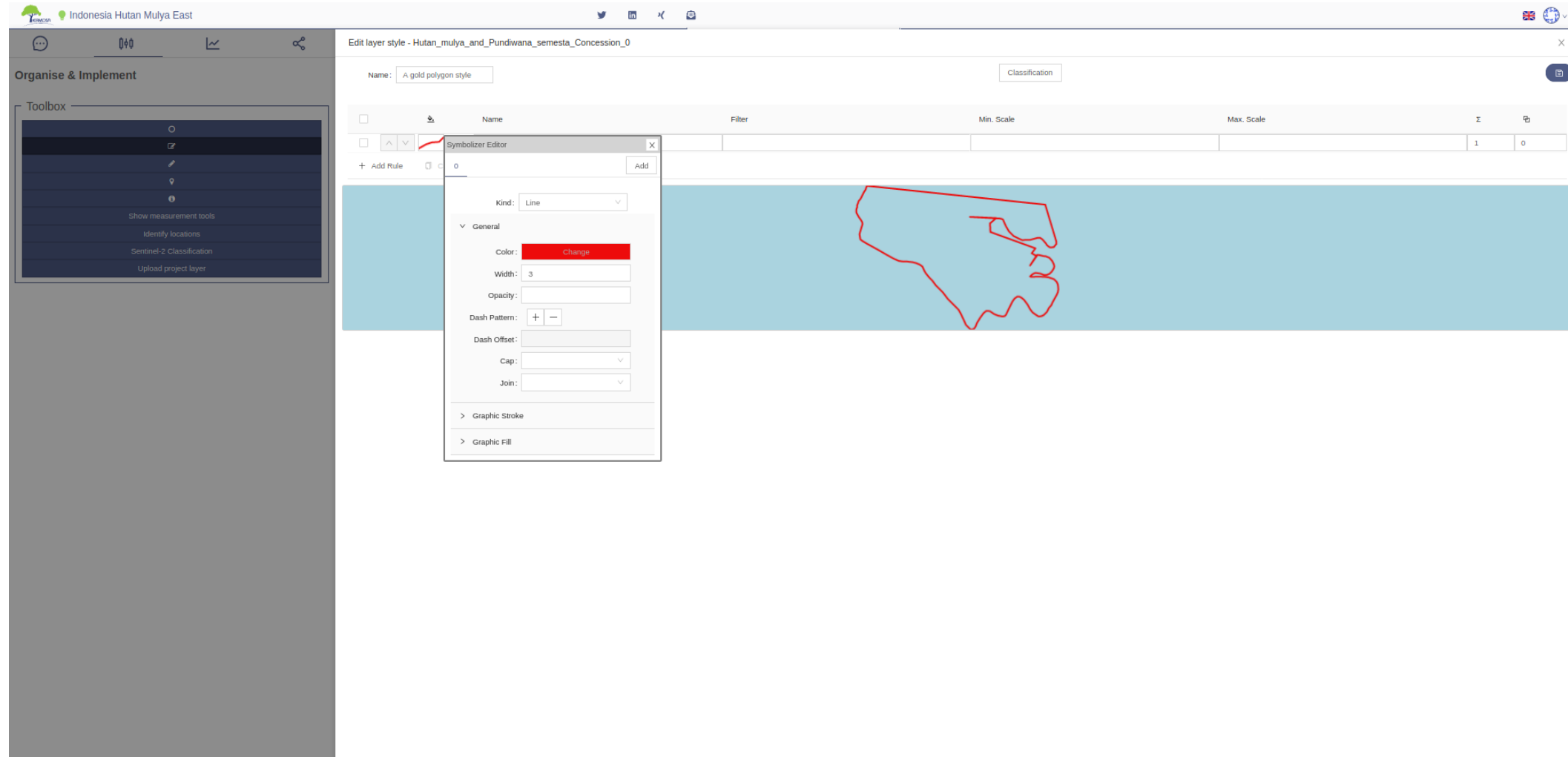
The screenshot displays the HERMOSA web application interface for the 'Mount Kilimanjaro Reforestation' project. The main content area is titled 'Project details - Mount Kilimanjaro Reforestation' and features three tabs: 'Common', 'Images', and 'Participants', with the latter highlighted by a red box. A dropdown menu is open over the 'Participants' tab, showing a search bar 'Select a user' and a list of email addresses: pauline@ecosystem.org, sarah@ecosystems.org, chester@ecosystem.org, heather@ecosystem.org, olga@ecosystem.org, steven@ecosystem.org, peter@pan.com, and steve@pan.com. An 'Invite user' button is visible next to the search bar. The left sidebar is titled 'Identify & Connect' and includes a 'Create project' button, a search bar for projects and users, and a list of projects and users. The 'Users' section in the sidebar lists several email addresses, each with an envelope icon for communication.



Display own geodata

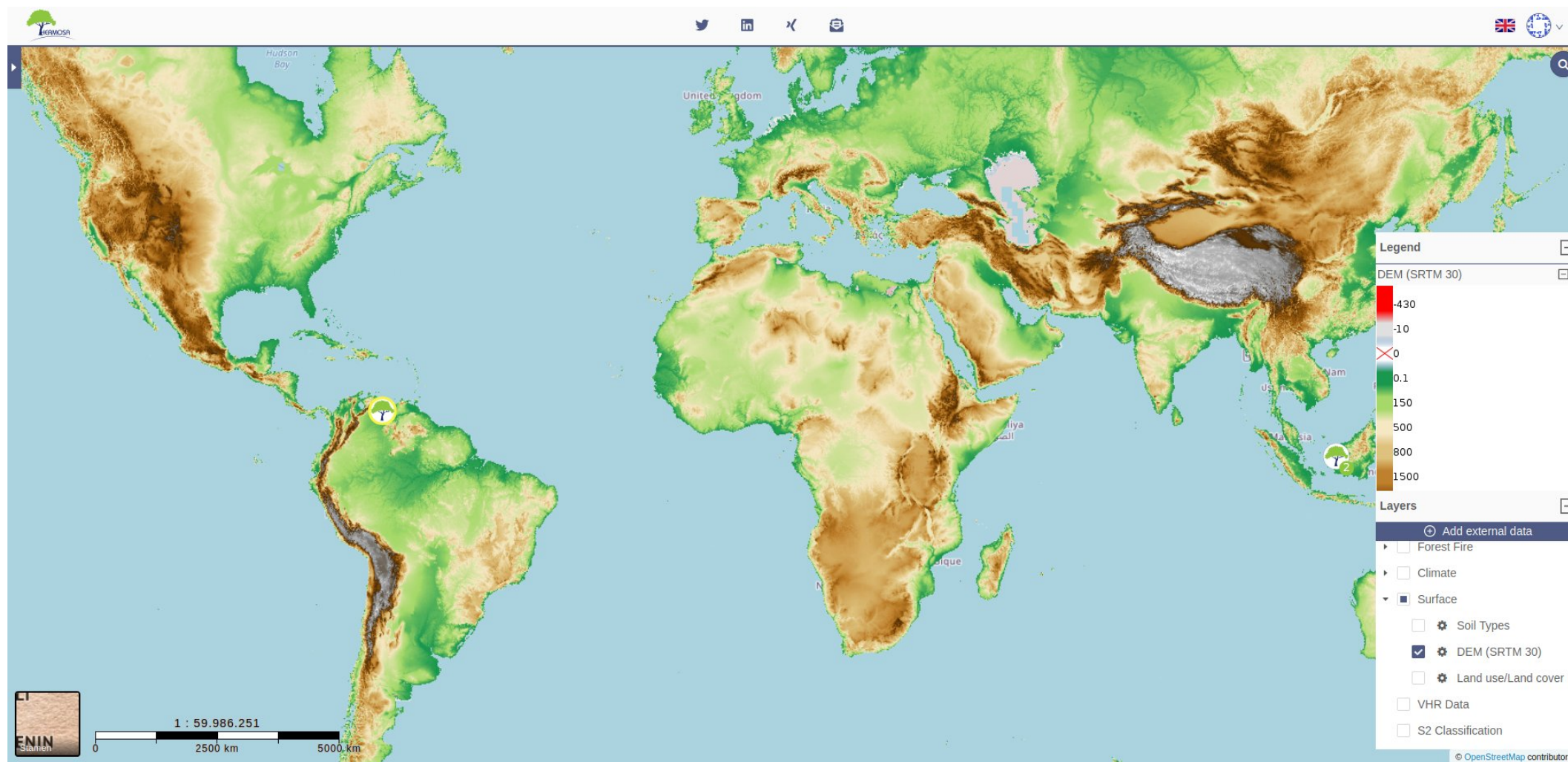


Modify own geodata

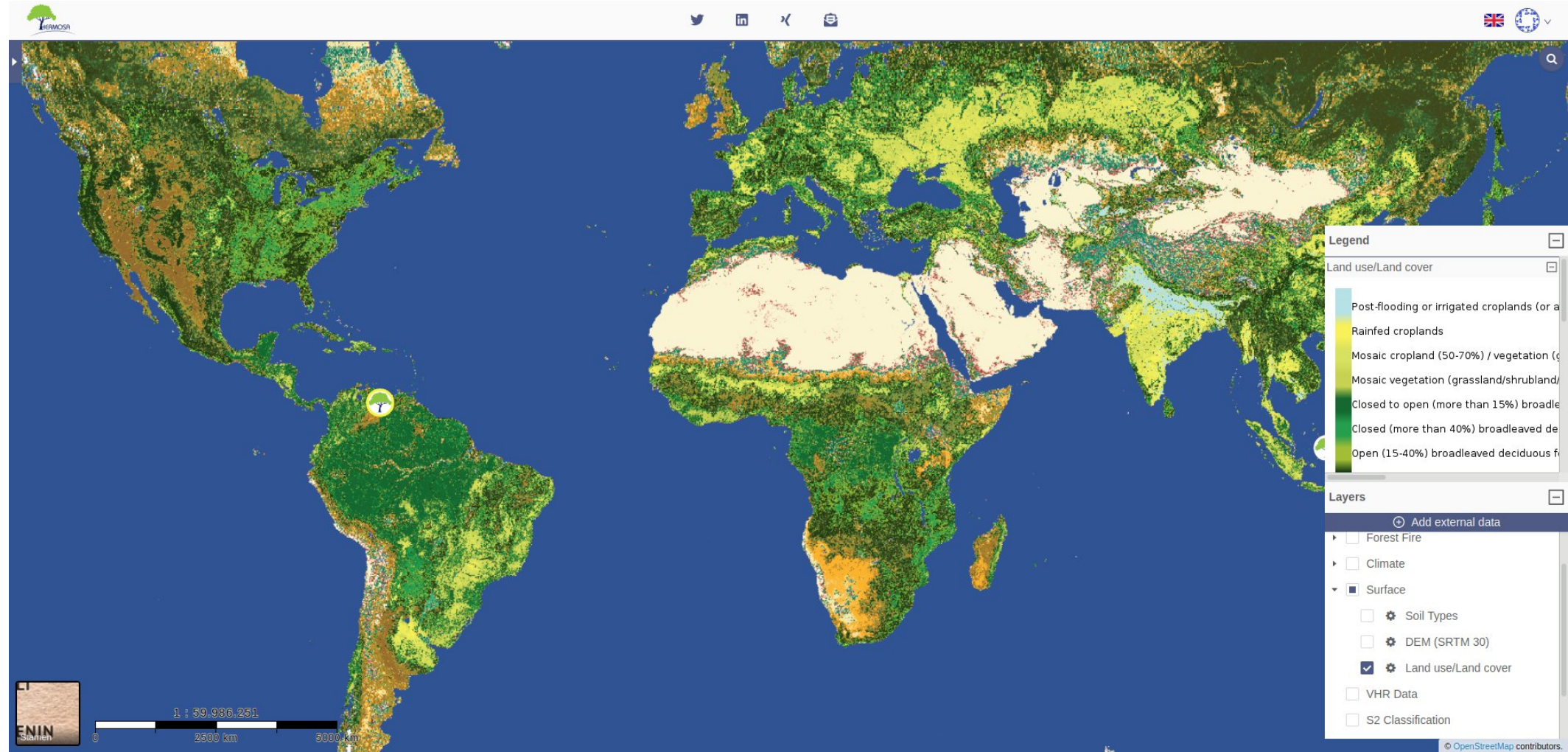


The screenshot displays a web-based GIS application interface. On the left, there is a sidebar titled "Organise & Implement" containing a "Toolbox" with various icons and options like "Show measurement tools", "Identify locations", "Sentinel-2 Classification", and "Upload project layer". The main area shows a map with a light blue background and a red polygon outline. A "Symbolizer Editor" dialog box is open, allowing the user to modify the style of a selected layer. The dialog has a "Name" field with the value "A gold polygon style" and a "Classification" button. Below this is a table with columns for "Name", "Filter", "Min. Scale", "Max. Scale", "Σ", and "ID". The table contains one row with "A gold polygon style" in the "Name" column, "1" in the "Σ" column, and "0" in the "ID" column. The "Symbolizer Editor" dialog has a "Kind" dropdown set to "Line". Under the "General" section, there are fields for "Color" (with a red "Change" button), "Width" (set to 3), "Opacity", "Dash Pattern" (with "+" and "-" buttons), "Dash Offset", "Cap", and "Join". There are also expandable sections for "Graphic Stroke" and "Graphic Fill".

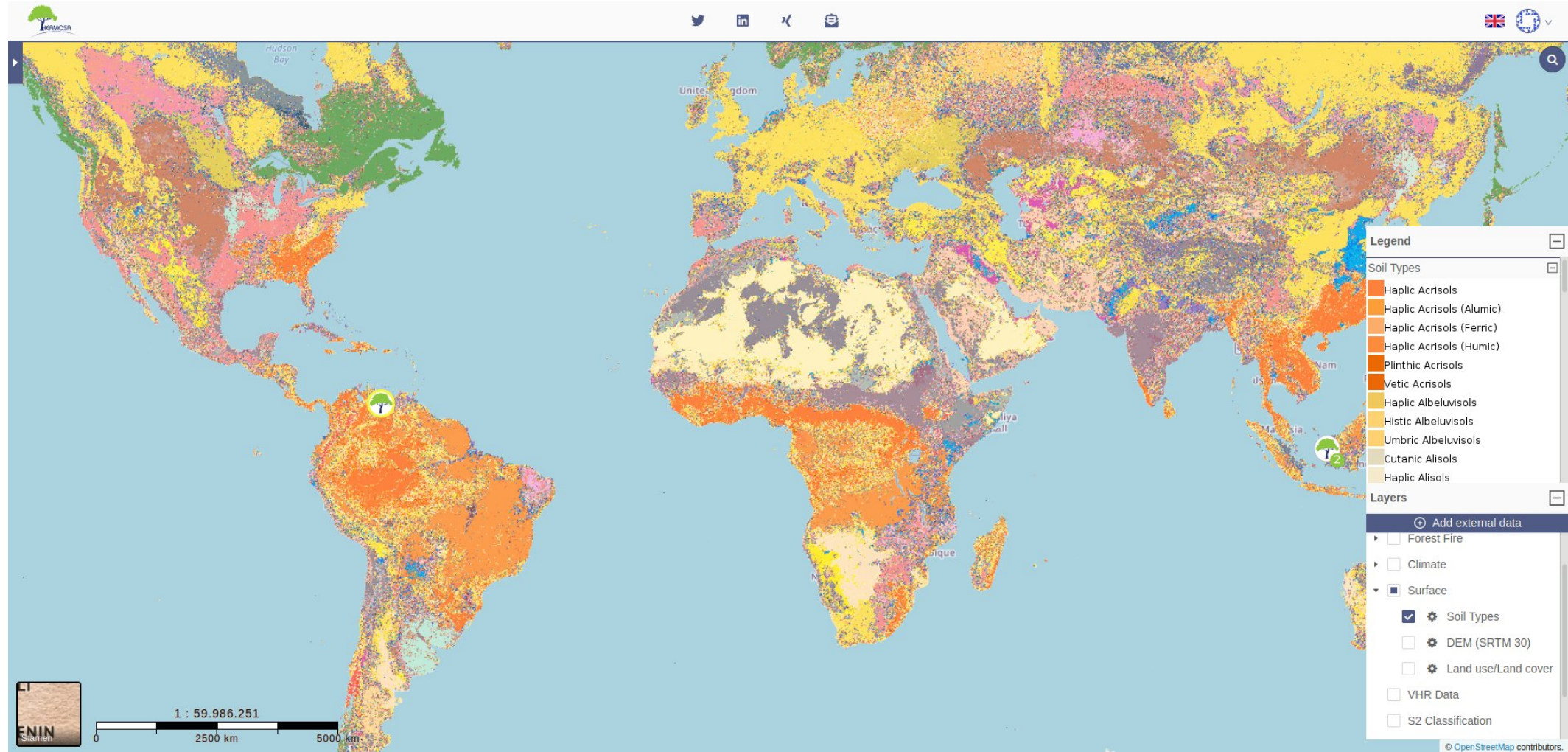
Easily access global datasets – e. g. DEM



Easily access global datasets – e. g. LULC

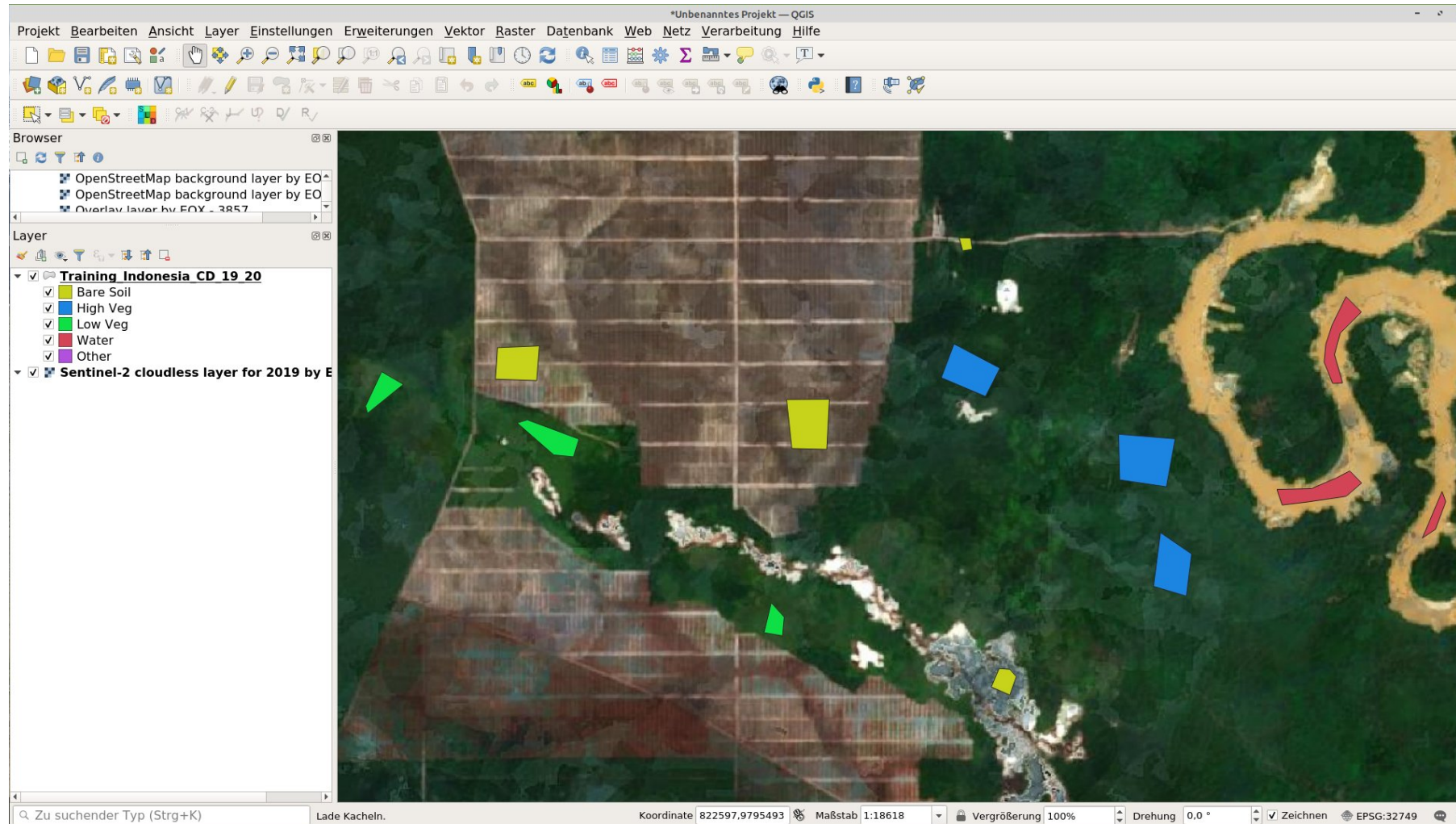


Easily access global datasets – e. g. Soil Types





Create training data for EO data classification



Dynamically calculate classifications using free satellite data, e. g. Copernicus programme






The screenshot shows the HERMOSA web application interface for processing Sentinel-2 satellite data. The main window displays a satellite image of a forested area with a winding river. A green rectangular box highlights a specific region of interest. On the left side, there is a 'Toolbox' with several icons and a 'Sentinel-2 Classification' option selected. Below the toolbox, there are input fields for 'Layer name', 'Number of points per class' (set to 500), 'Training percent' (set to 30%), 'Start date' (2020-10-29), 'End date' (2020-11-12), 'Cloud coverage' (set to 0), and 'Cloud threshold' (set to 2%). A 'Classification Input' field is also present. On the right side, there is a 'Layers' panel with a list of layers including 'Global Forest Watch', 'Forest Fire', 'Climate', 'Surface', 'VHR Data', and 'S2 Classification'. The 'S2 Classification' layer is expanded, showing sub-layers like 'HP_FNF_2020', 'NFF_hutan_mulya_2019', and 'FNF_S2_classification_2020'. The bottom of the interface shows a scale bar (1:30,173) and a map data attribution for Sentinel-2 cloudless data.


Utilize classifications at different points in time to compute change detection




Layer name ⓘ:



Number of points per class ⓘ: Training percent ⓘ: 


Start date ⓘ: ⓘ  End date ⓘ: ⓘ  **July 2019**

Cloud coverage ⓘ: Cloud threshold ⓘ: 

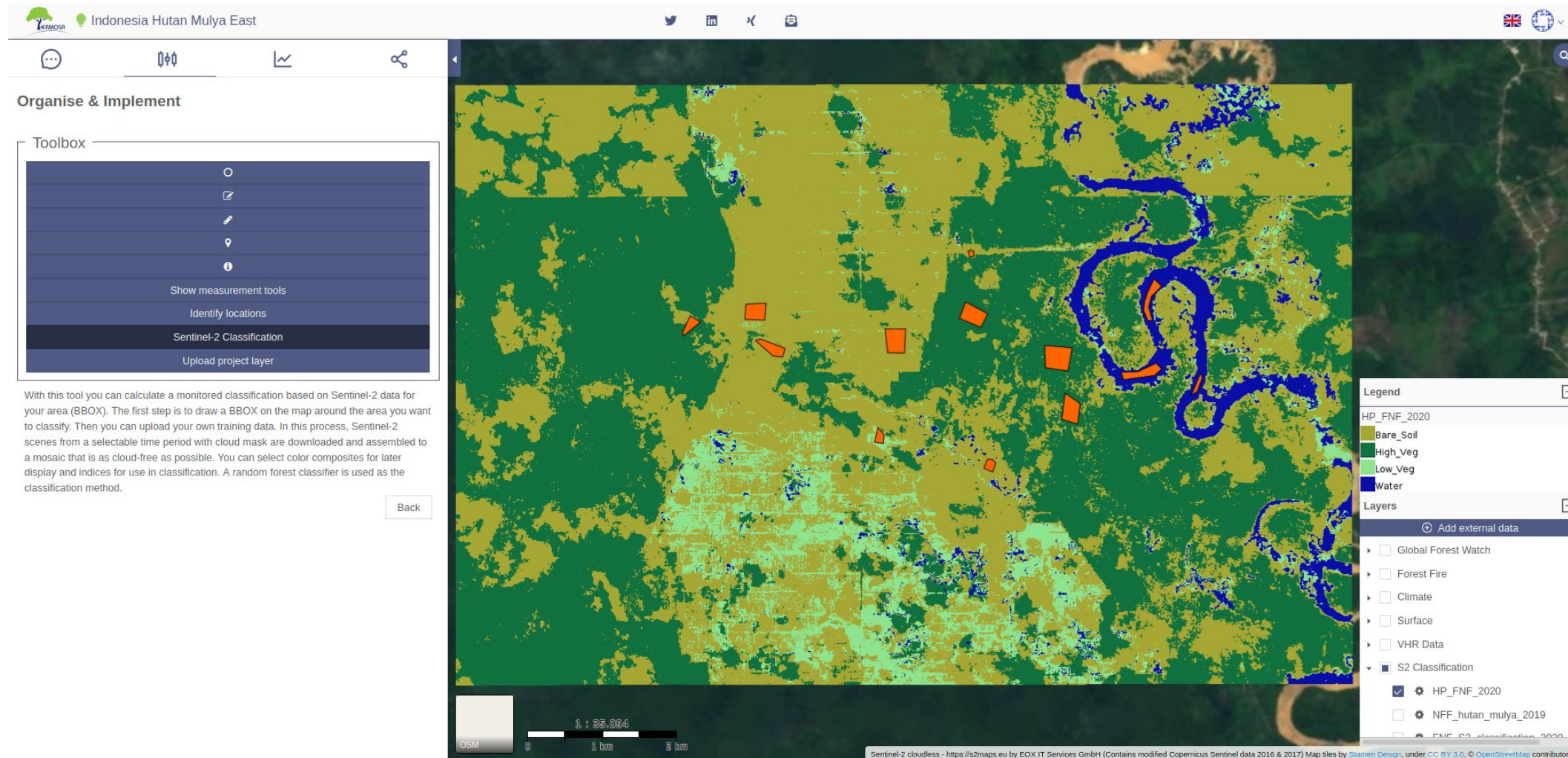
Layer name ⓘ:

Number of points per class ⓘ: Training percent ⓘ: 

Start date ⓘ: ⓘ  End date ⓘ: ⓘ  **July 2020**

Cloud coverage ⓘ: Cloud threshold ⓘ: 

Calculations can be repeated as often as necessary and results are used in the reporting



Indonesia Hutan Mulya East

Organise & Implement

Toolbox

- Show measurement tools
- Identify locations
- Sentinel-2 Classification**
- Upload project layer

With this tool you can calculate a monitored classification based on Sentinel-2 data for your area (BBOX). The first step is to draw a BBOX on the map around the area you want to classify. Then you can upload your own training data. In this process, Sentinel-2 scenes from a selectable time period with cloud mask are downloaded and assembled to a mosaic that is as cloud-free as possible. You can select color composites for later display and indices for use in classification. A random forest classifier is used as the classification method.

Legend

- HP_FNF_2020
- Bare_Soil
- High_Veg
- Low_Veg
- Water

Layers

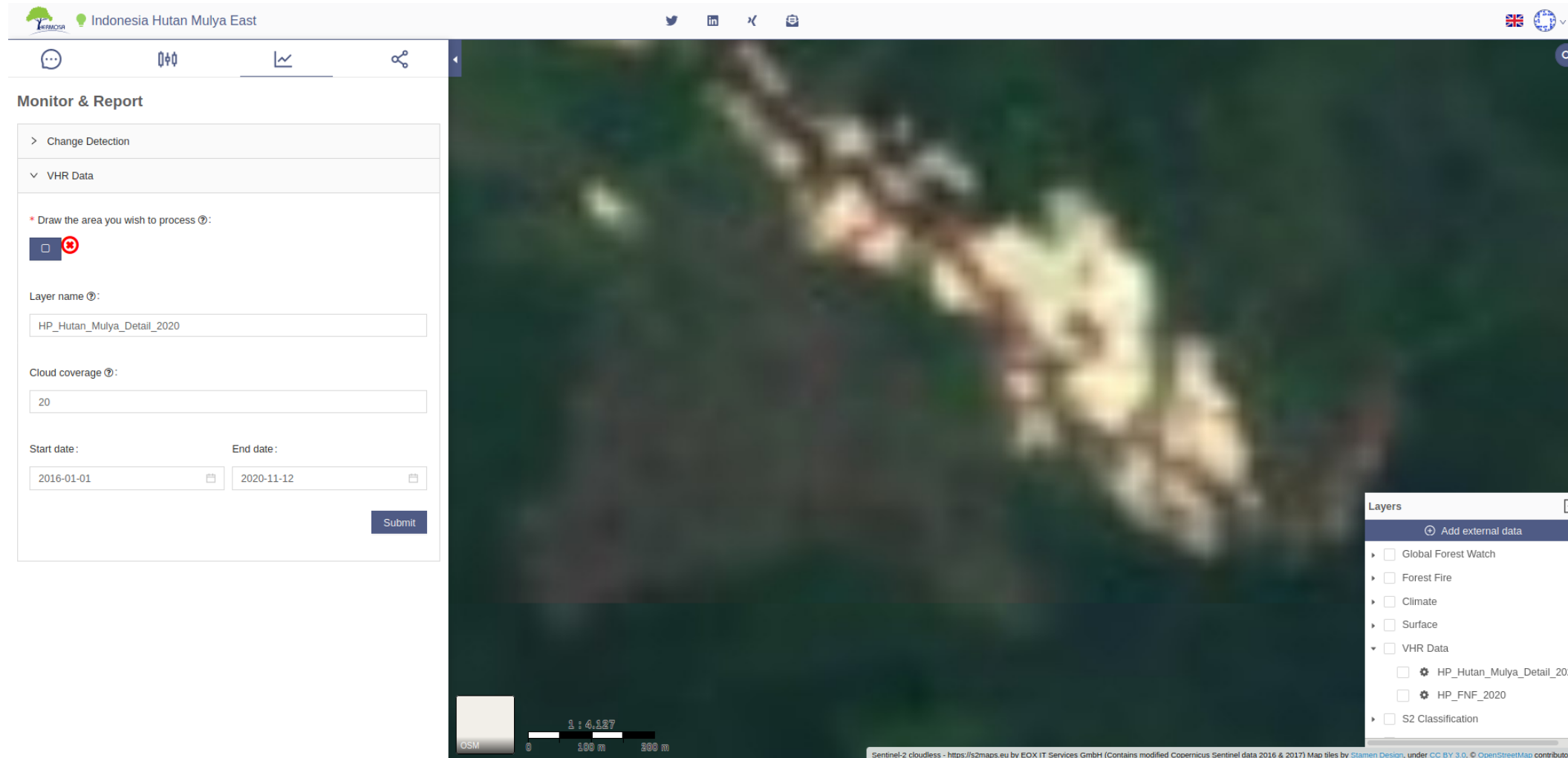
- Global Forest Watch
- Forest Fire
- Climate
- Surface
- VHR Data
- S2 Classification**
 - HP_FNF_2020
 - NFF_hutan_mulya_2019
 - FNF_S2_classification_2020

Scale: 1 : 33.004

OSM

Sentinel-2 cloudless - <https://s2maps.eu> by EOX IT Services GmbH (Contains modified Copernicus Sentinel data 2016 & 2017) Map tiles by [Stamen Design](#), under [CC BY 3.0](#). © [OpenStreetMap](#) contributors.

HR data is sometimes not good enough



Indonesia Hutan Mulya East

Monitor & Report

- > Change Detection
- ▼ VHR Data

* Draw the area you wish to process @:

Layer name @:

HP_Hutan_Mulya_Detail_2020

Cloud coverage @:

20

Start date: 2016-01-01 End date: 2020-11-12

Submit

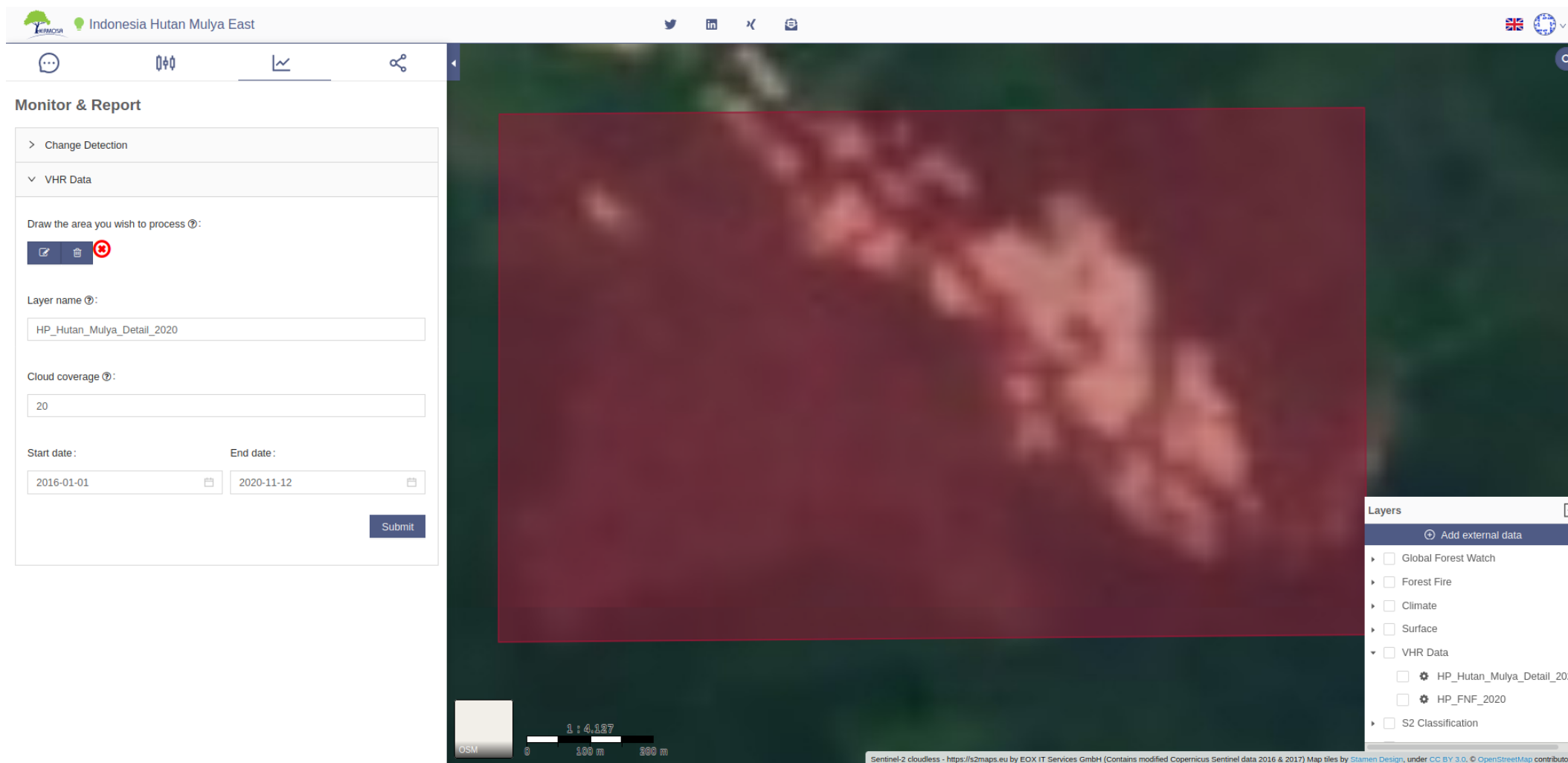
Layers

- ◉ Add external data
- Global Forest Watch
- Forest Fire
- Climate
- Surface
- ▼ VHR Data
 - HP_Hutan_Mulya_Detail_2020
 - HP_FNF_2020
 - S2 Classification

OSM 1 : 4,127 0 100 m 200 m

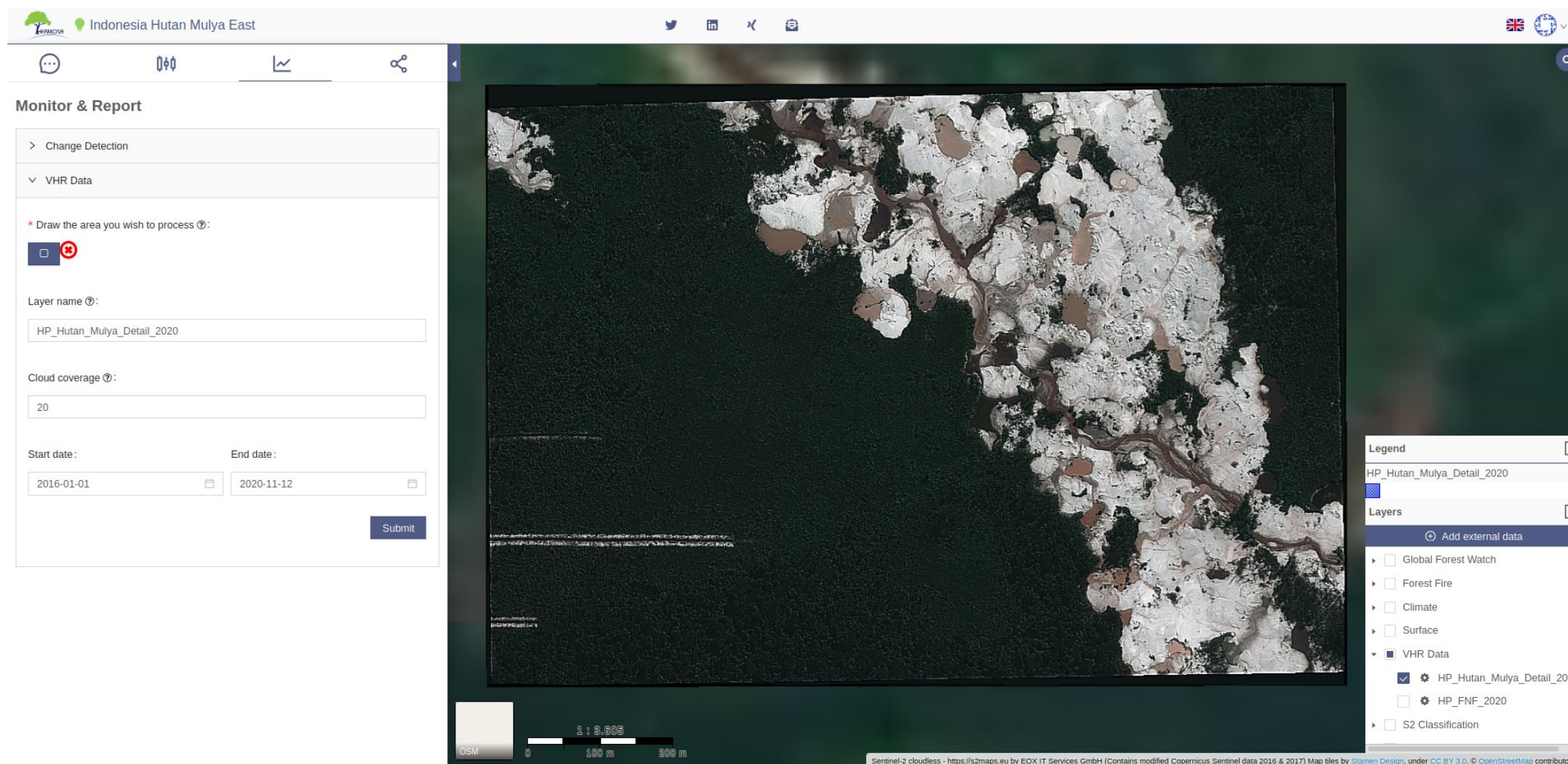
Sentinel-2 cloudless - <https://s2maps.eu> by EOX IT Services GmbH (Contains modified Copernicus Sentinel data 2016 & 2017) Map tiles by [Stamen Design](#), under [CC BY 3.0](#). © [OpenStreetMap](#) contributors.

Access VHR data through the API



The screenshot displays the HERMOSA web interface for 'Indonesia Hutan Mulya East'. The left sidebar contains a 'Monitor & Report' section with a 'VHR Data' subsection. Under 'VHR Data', there is a 'Draw the area you wish to process' section with a drawing tool icon and a red error icon. Below this is a 'Layer name' field containing 'HP_Hutan_Mulya_Detail_2020', a 'Cloud coverage' field with '20', and date pickers for 'Start date' (2016-01-01) and 'End date' (2020-11-12). A 'Submit' button is at the bottom of this section. The main map area shows a satellite image with a large red rectangular overlay. The bottom right corner features a 'Layers' panel with a search icon and a list of layers: 'Global Forest Watch', 'Forest Fire', 'Climate', 'Surface', 'VHR Data', 'HP_Hutan_Mulya_Detail_2020', 'HP_FNF_2020', and 'S2 Classification'. The 'VHR Data' section is expanded, showing the selected layer. At the bottom of the map, there is a scale bar (1:4,127) and a small 'OSM' logo. The footer text reads: 'Sentinel-2 cloudless - https://s2maps.eu by EOX IT Services GmbH (Contains modified Copernicus Sentinel data 2016 & 2017) Map tiles by Stamen Design, under CC BY 3.0, © OpenStreetMap contributors.'

Spatial resolution down to 0.5 meters



Indonesia Hutan Mulya East

Monitor & Report

- > Change Detection
- ▼ VHR Data

* Draw the area you wish to process:

Layer name: HP_Hutan_Mulya_Detail_2020

Cloud coverage: 20

Start date: 2016-01-01 End date: 2020-11-12

Submit

Legend

- HP_Hutan_Mulya_Detail_2020

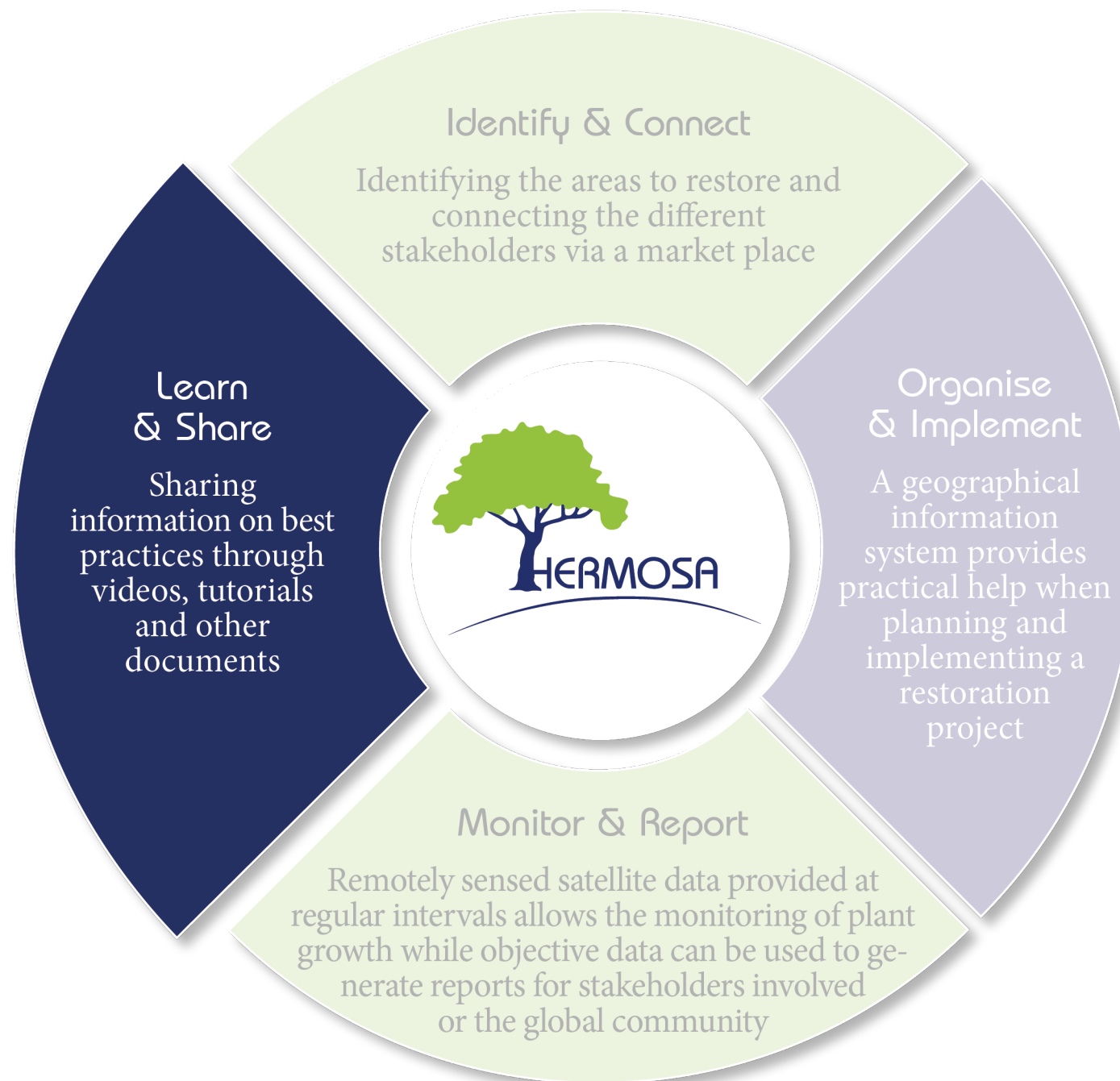
Layers

- Global Forest Watch
- Forest Fire
- Climate
- Surface
- VHR Data
 - HP_Hutan_Mulya_Detail_2020
 - HP_FNF_2020
 - S2 Classification

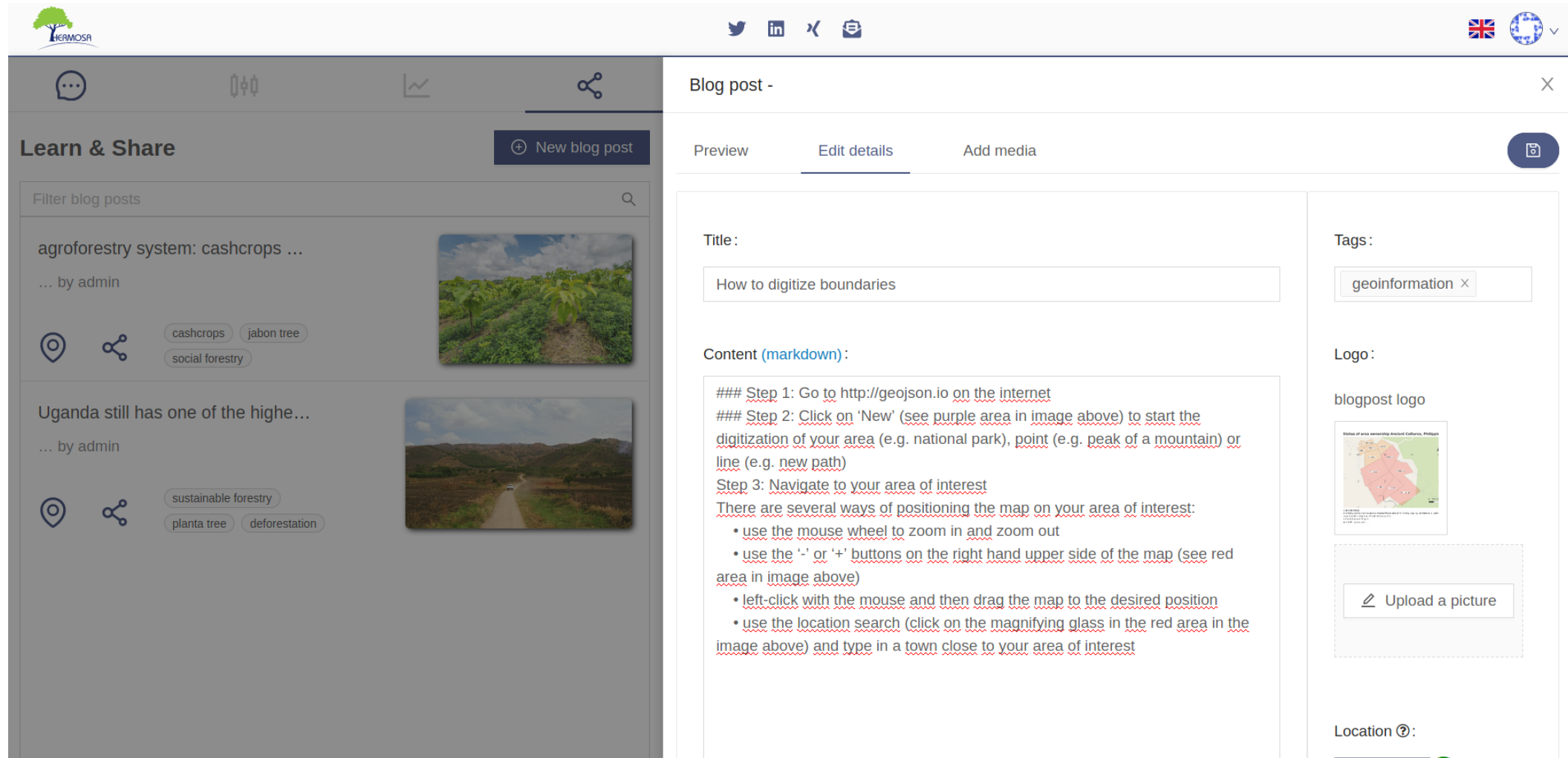
Scale: 1 : 8,000

OSM

Seniinel-2 cloudless - <https://s2maps.eu> by EOX IT Services GmbH (Contains modified Copernicus Sentinel data 2016 & 2017) Map tiles by [Stamen Design](#), under [CC BY 3.0](#). © [OpenStreetMap](#) contributors.



Sharing own knowledge



The screenshot displays the HERMOSA platform interface. On the left, a sidebar titled "Learn & Share" features a search bar for "Filter blog posts" and a list of two blog posts. The first post is titled "agroforestry system: cashcrops ..." by admin, with tags for "cashcrops", "jabon tree", and "social forestry", and an image of a field. The second post is titled "Uganda still has one of the highe..." by admin, with tags for "sustainable forestry", "planta tree", and "deforestation", and an image of a road. The main area shows a "Blog post -" editor with tabs for "Preview", "Edit details", and "Add media". The "Edit details" tab is active, showing a "Title" field with the text "How to digitize boundaries". The "Content (markdown)" field contains the following text:

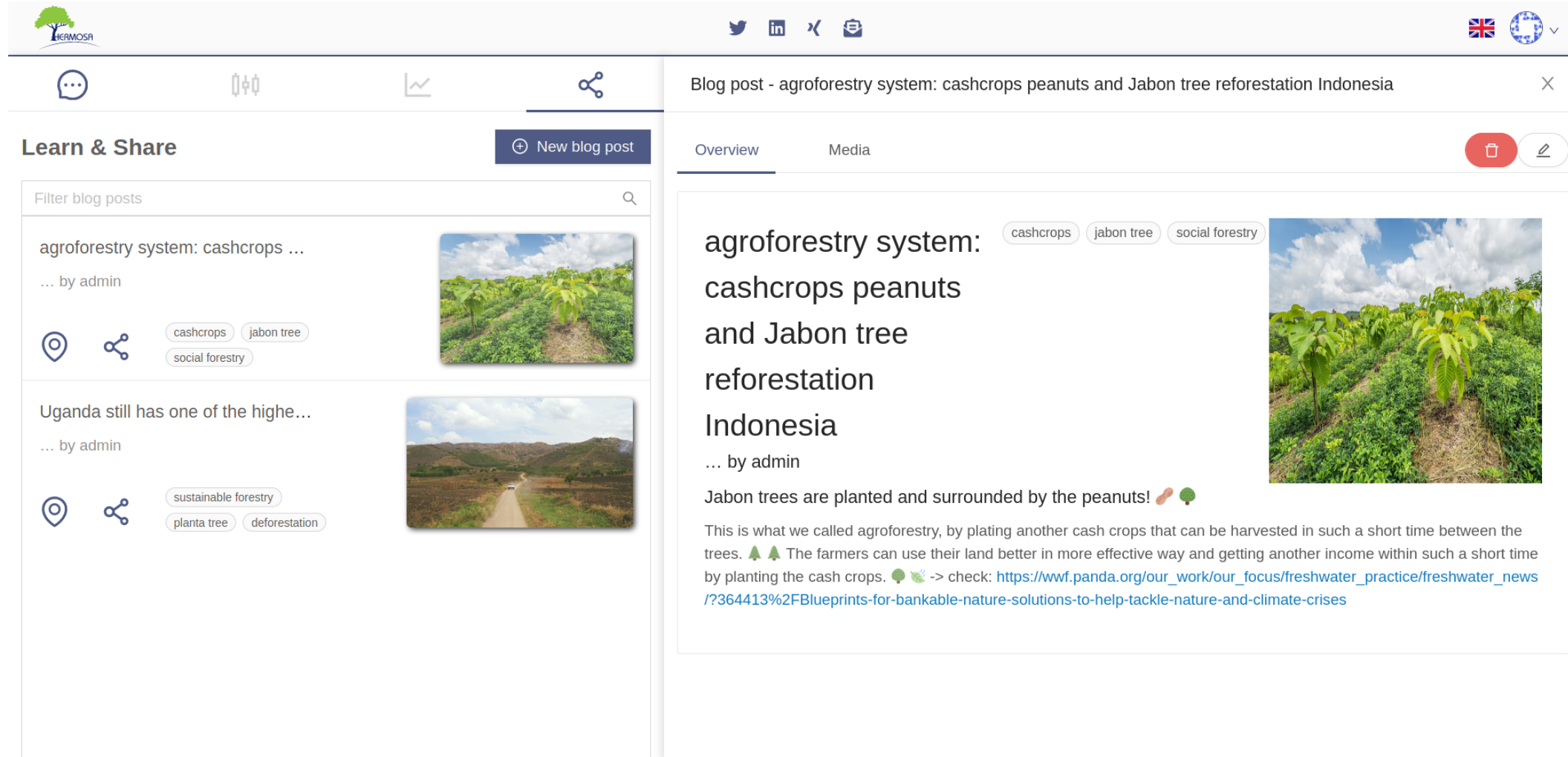
```
### Step 1: Go to http://geojson.io on the internet
### Step 2: Click on 'New' (see purple area in image above) to start the digitization of your area (e.g. national park), point (e.g. peak of a mountain) or line (e.g. new path)
Step 3: Navigate to your area of interest
There are several ways of positioning the map on your area of interest:


- use the mouse wheel to zoom in and zoom out
- use the '-' or '+' buttons on the right hand upper side of the map (see red area in image above)
- left-click with the mouse and then drag the map to the desired position
- use the location search (click on the magnifying glass in the red area in the image above) and type in a town close to your area of interest

```

 The right sidebar includes a "Tags" field with "geoinformation" selected, a "Logo" field with a "blogpost logo" image and an "Upload a picture" button, and a "Location" field.

Communicating about the success stories



The screenshot displays the HERMOSA website interface. At the top, there is a navigation bar with the HERMOSA logo, social media icons (Twitter, LinkedIn, Facebook, Email), and language selection options (UK and EU flags). Below the navigation bar, there is a search bar and a 'Learn & Share' section with a 'New blog post' button. The main content area is divided into two columns. The left column shows a list of blog posts, with the first one titled 'agroforestry system: cashcrops ...' by admin. This post includes a thumbnail image of a field with young trees and cash crops, and tags for 'cashcrops', 'jabon tree', and 'social forestry'. The right column shows the full content of the selected blog post, titled 'agroforestry system: cashcrops peanuts and Jabon tree reforestation Indonesia' by admin. The post features a large image of the agroforestry system, a sub-headline 'agroforestry system: cashcrops peanuts and Jabon tree reforestation Indonesia', and a short paragraph: 'Jabon trees are planted and surrounded by the peanuts! 🌱🌳'. Below this, there is a longer paragraph explaining agroforestry and a link to a WWF article: https://wwf.panda.org/our_work/our_focus/freshwater_practice/freshwater_news/?364413%2FBBlueprints-for-bankable-nature-solutions-to-help-tackle-nature-and-climate-crises.

Current status and outlook

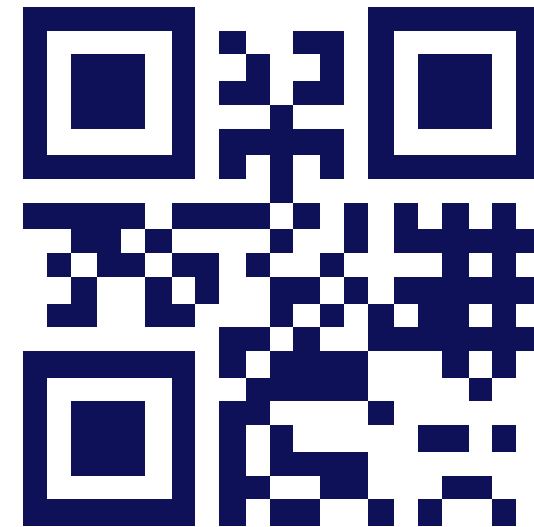


- HERMOSA is not finished yet!
- Work is ongoing to improve functionality and usability
- HERMOSA is based on international standards and aims to be open and inclusive
- Users are welcome to try out the platform
- Production-ready by the start of the UN Decade on Ecosystem Restoration in 2021
- Please visit <https://hermosa.mundialis.de> for more information

Thank you for watching and listening!
Please contact us for any questions.

mundialis GmbH & Co. KG
Koelnstrasse 99
53111 Bonn, Germany

Email: hermosa@mundialis.de
Web: <https://www.mundialis.de>
Phone: +49 228 38 75 80 80



mundialis