



**Digital public infrastructure
for EUDR compliance:
Whisp to implement
convergence of evidence**

Context

The document “Digital public infrastructure for EUDR compliance: *Whisp* to implement convergence of evidence” will be shared at the upcoming Forest Data Partnership Annual Meeting, to be held on the 19th and 20th of March, 2024, at the Rome Headquarters. This event is hosted by the Food and Agriculture Organization of the United Nations (FAO).

The European Union recently adopted a new regulation (commonly called EUDR, standing for “EU regulation on deforestation”¹) to minimize the risk of deforestation and forest degradation associated with products placed on and exported from the EU Single Market. Other consumer markets (UK, US and others) are in the process of preparing regulations with similar objectives.

Under the umbrella of the Team Europe Initiative (TEI) Zero-Deforestation Hub ([launched at COP28](#)), the [Forest Data Partnership](#) and the [AIM4Forests Programme](#) work with [AgStack](#) on the development of a digital public infrastructure to support compliance on forest monitoring aspects of the regulation. This collaboration supports smallholders through open-source solutions to overcome key digital gaps and enable continued access to the EU market. Additional information can be found in [Annexes 3 and 4](#).

Convergence of evidence

The Forest Data Partnership and the AIM4Forests Programme aim to align stakeholders to reach consensus around key datasets and address critical gaps in the ever-expanding landscape of forest monitoring data.

A whole range of satellite-derived forest, land use and tree cover maps are available publicly, including the Forest 2020 layer of the EU Observatory, and also several others. However, those products often show substantial differences, not least because of (apparently) contradicting definitions and land cover classification systems used. Rather than choosing a single dataset, the various datasets should be used together. When translating definitions into common terms, the datasets can provide more nuanced and complementary details on a specific plot. The European Forest Institute offers additional details on [the role of geospatial information for EUDR due diligence](#).

As such, the Forest Data Partnership and the AIM4Forests Programme promote a convergence of evidence approach: **no single definitive source of geospatial data can tell the whole story around any given plot of land**, but various existing datasets contribute to understanding what has most probably occurred at that location and support to lessen the impact of individual biases or errors present in any single piece of evidence/data source.

Asset-Registry

The due diligence requested by the EUDR must include “the geolocation of all plots of land where the relevant commodities (...) were produced” (art.9-d).

AgStack developed a minimum viable product to cover that requirement, in the framework of a collaboration with DIASCA. The [asset registry](#) is a free public registry to create and maintain ubiquitous, geo-intelligent unique “public geoIDs” for field boundaries without requiring any other attribution. The asset-registry is addressable but not discoverable, geoIDs are anonymous and do not carry personal or any other information.

It allows for the creation of boundaries, standardisation of existing vector files and ensures seamless shareability and interoperability with any system, through its API.

The Python code is open-source and available at <https://github.com/agstack/asset-registry>

1 [Regulation \(EU\) 2023/ of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation \(EU\) No 995/2010](#)

WHAT IS in that Plot? (*Whisp*)

Whisp is an open-source solution to implement the convergence of evidence approach within any plot of land to produce relevant forest monitoring information and support the due diligence process for the zero-deforestation requirement.

The geospatial analysis provides insight on what various datasets suggest is contained in a given plot, at the cut-off date (31/12/2020). Each dataset is chosen for its relevance to informing land use. When considered together, they provide a base for a convergence of evidence approach.

The analysis consists of extracting zonal statistics (i.e., counting relevant pixels) from a series of public datasets for a set of polygons (i.e., a plot of land). The geospatial analysis is presented in a tabular form where each geoID is a unit of information.

The types of datasets reported on, fall into different categories:

- 1) forest and tree cover at the end of 2020
- 2) deforestation since 2020
- 3) crop plantations and other agricultural uses
- 4) areas of significance for conservation.

For more info see [A-1 Integration of Public Geo-Data](#)

Whisp technical specification

The source code is public and available at <https://github.com/forestdatapartnership/whisp>.

Whisp is currently powered by *Google Earth Engine* (GEE).

Inputs:

- A **list of geoIDs** from the asset-registry, one for each plot of land to monitor
Ex: `0520cfac98fbc1bd7952b1c07a9f6983b83625722b6f665ea83ac9aad3512918`
- A **customized selection** of geospatial layers to include in the analysis
Ex: [A-1 Integration of Public Geo-Data](#)

Outputs:

- A **table** with tree cover, forest and commodities statistics from geospatial layers to effectively implement the convergence of evidence approach. An example of a table output to be found in the [A-2 Table output example](#)
- A **link** to a satellite image visual interpretation interface.
Ex: <https://app.collect.earth/collection?projectId=40466>. This is done through a [Collect Earth Online](#) project which allows to visualise with time-tagged high resolution satellite data each plot processed through *whisp*.

Whisp access pathways

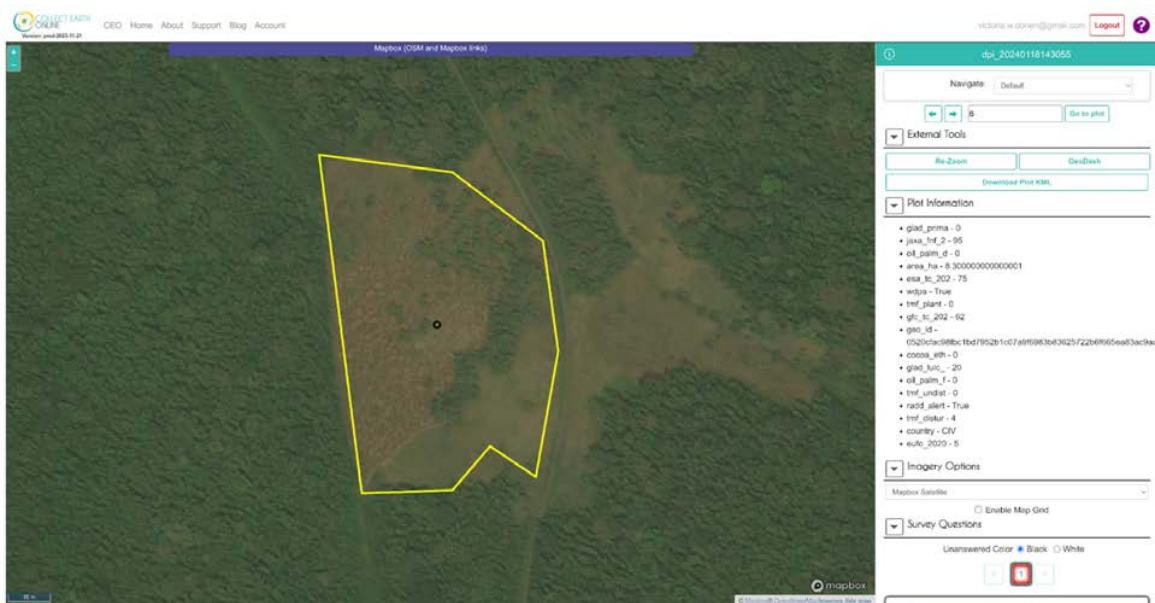
Three access pathways are available for *Whisp*, all intended to ensure reproducibility among each other.

1. AS AN OPERATIONAL API TO EXTRACT STATISTICS FOR PLOTS OF LAND

Users can choose to either use the user interface to send a single geoID or multiple geoIDs, or they can make a call to the *Whisp* API from their own software. The API is capable of processing lists of geoIDs or geometries and can perform geospatial analysis. The input may include pre-existing geoIDs or various types of geometries such as shp, kml, geojson, csv, and wkt.

The *Whisp* API is designed for any user who wants to produce land cover information on given plots of land. It can be used by operators, third-party verifiers and government authorities in producing and consumer countries. It facilitates the interface between the *AgStack* asset-registry and the processing of datasets to implement the Convergence of evidence approach. It is meant to be interoperable with any geolocation system written in usual programming languages (Python and JS).

It also provides a direct link to *Collect Earth Online* (CEO) and *Collect Earth Desktop* (CE) as a verification application for visual validation. This could be used by competent authorities for verification purposes, checking the entirety of the plots submitted or a given sub-sample.

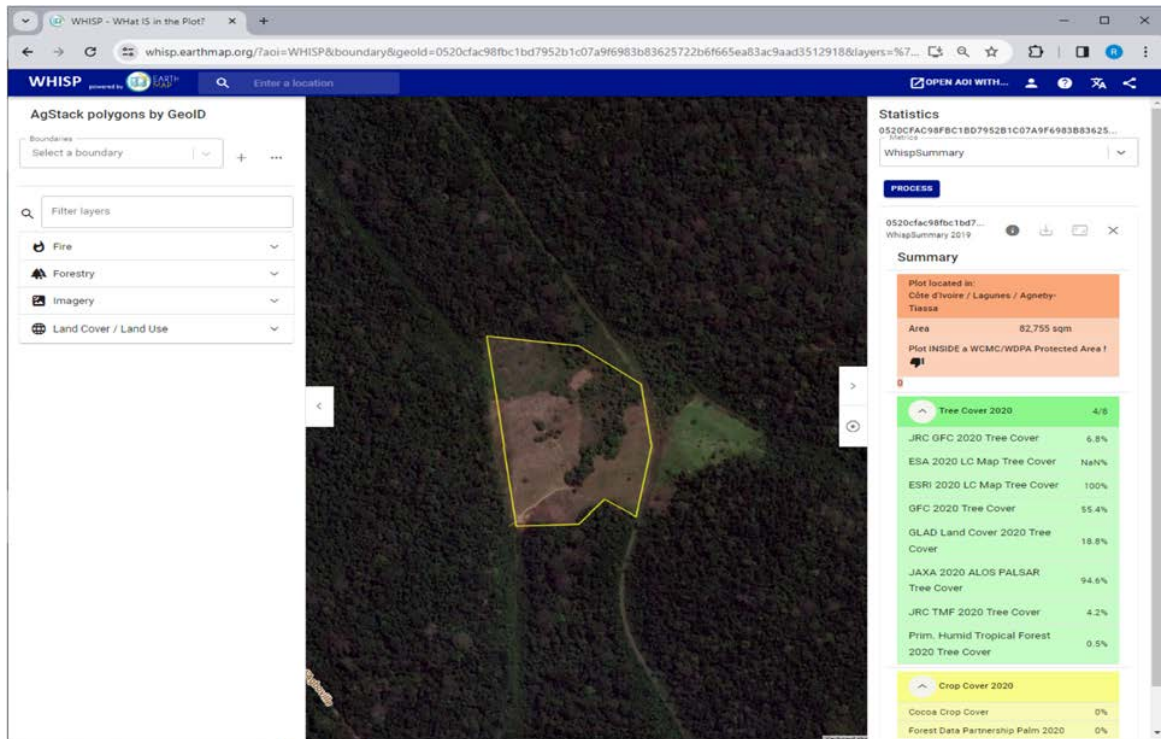


2. AS AN EARTHMAP SPINOFF FOR DEMONSTRATION PURPOSES

Whisp on EarthMap designed for demonstration and visualisation purposes, enables users to input AgStack-generated geolDs [or draw a geometry directly on the screen] and explore more in detail the underlying sources of data. Using a graphical interface (GUI), users can effortlessly choose and select data sources to include in the geospatial analysis. The wide array of available data is organised into user-friendly categories such as “Forestry”, “Land Cover/Land Use”, “Biodiversity”, and potentially more to choose from.

Furthermore, *Whisp on EarthMap* includes user-friendly features e.g. analysing *AgStack* polygons, generating summary statistics, and enabling bulk processing of polygons for faster analysis.

Whisp on EarthMap will also serve as a user interface to *AgStack* in order to improve the interaction of small-holders/cooperative representatives in managing and editing their plots, and facilitating monitoring.

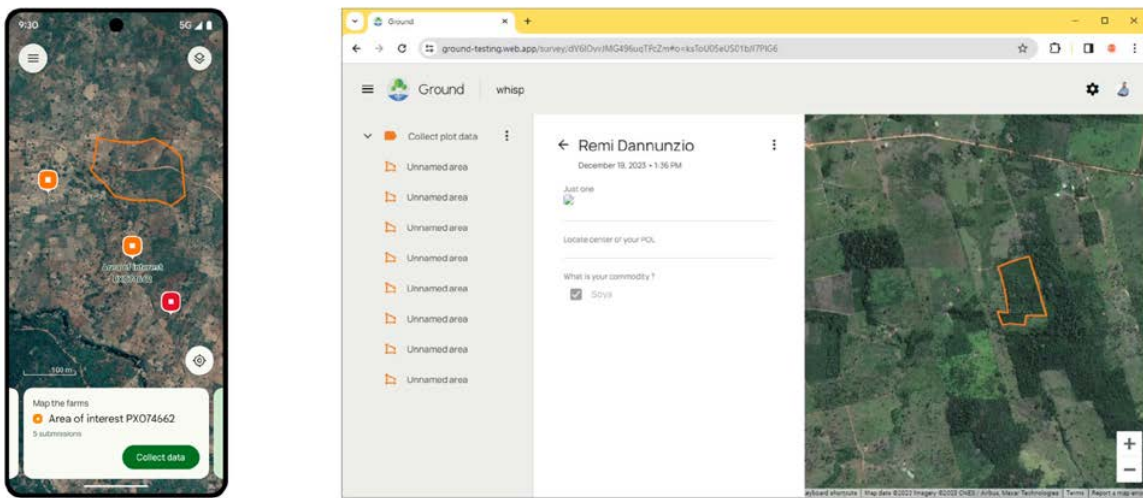


Ex: <https://whisp.earthmap.org>

3. AS A FEATURE IN MOBILE APPS TO ENABLE SMALLHOLDERS TO OWN THEIR MONITORING DATA

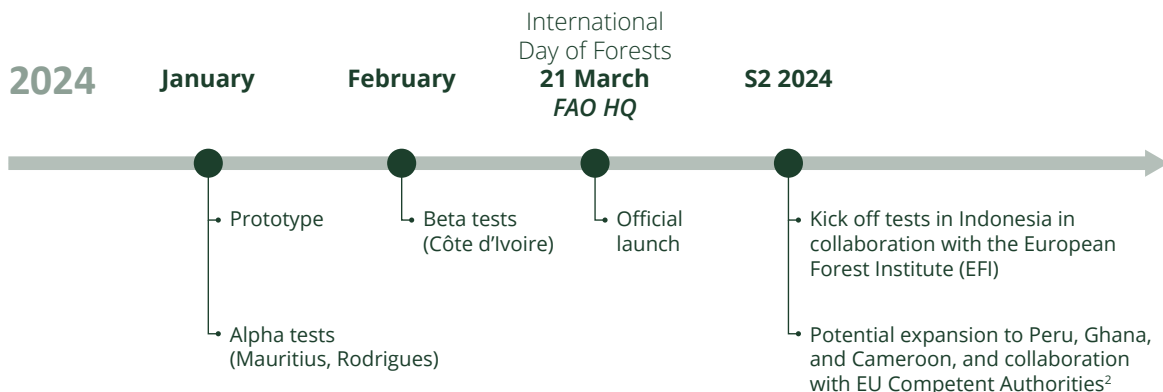
To enable smallholders to produce their monitoring data, *Whisp* can be added to geolocation mobile applications to offer a solution for creating geolDs on the go and generate the main table output. This enables smallholders to generate comprehensive information with a few clicks on their mobile devices. Notably, *Whisp* is available in the *Ground* app.

Whisp in *Ground* allows collecting data in two ways: either by drawing the plot of land on the screen over recent satellite imagery that covers the area of interest, or by enabling the GPS on the mobile device and taking points along the way. Unique geolD(s) and related information are generated and shown on the app. Additionally, users have the option to export these geolDs as a CSV file.



2024 *Whisp* development journey

Where is *Whisp* going next?



² EU Competent Authorities are the national government bodies responsible for implementing and enforcing European Union (EU) legislation in their respective member states. They play a crucial role in ensuring the smooth functioning of the Single Market and protecting the interests of EU citizens.

Appendix

APPENDIX 1 PUBLIC GEOSPATIAL LAYERS INCLUDED IN *WHISP*

Dataset name	Preparation script	Asset Id	Description of zonal statistics applied
EUFO_2020	jrc_gfc_2020.py	ee.ImageCollection("JRC/GFC2020/V1")	Binary values, where 1 is forest.
GLAD_Primary	glad_pht.py	ee.ImageCollection("UMD/GLAD/PRIMARY_HUMID_TROPICAL_FORESTS/v1") Ancillary data: ee.Image("UMD/hansen/global_forest_change_2022_v1_10");	Binary input layer representing primary forest in 2001. Loss pixels between 2001-2020 were then removed (using the ancillary GFC data product).
TMF_undist	jrc_tmf_undisturbed.py	ee.ImageCollection('projects/JRC/TMF/v1_2021/TransitionMap_Subtypes')	Select tropical moist forest classes in 2020 representing undisturbed cover (i.e. classes 10, 11 and 12).
JAXA_FNF_2020	jaxa_forest.py	ee.ImageCollection("JAXA/ALOS/PALSAR/YEARLY/FNF4")	Select classes dense and non-dense forest classes (i.e., classes 1 and 2), and data from the year 2020.
GFC_TC_2020	glad_gfc_10pc.py	ee.Image("UMD/hansen/global_forest_change_2022_v1_10");	Select areas of tree cover over 10 percent and remove loss pixels between 2001-2000.
GLAD_LULC_2020	glad_lulc_stable.py	ee.Image('projects/glad/GLCLU2020/v2/LCLUC_2020')	Select classes from the 2020 land cover map representing stable tree cover over 5m in height (i.e. classes 27 to 48, and 127 to 148).
ESA_TC_2020	esa_world_cover.py	ee.Image("ESA/WorldCover/v100/2020")	Select trees and mangrove classes (i.e., 10 and 95) for 2020.
TMF_disturbed	jrc_tmf_disturbed.py	ee.ImageCollection('projects/JRC/TMF/v1_2021/TransitionMap_Subtypes')	Select classes representing tree cover classified as degraded, regrowth or with some ongoing deforestation in 2020 (i.e., classes 21-26; 61-62; 31-33; 63-64; 51-54; 67 and 92-94)
RADD_alerts	wur_radd_alerts.py	ee.ImageCollection('projects/radar-wur/raddalert/v1') Ancillary data: ee.ImageCollection("UMD/GLAD/PRIMARY_HUMID_TROPICAL_FORESTS/v1")	Select confirmed (i.e., class 3) alerts in previous 2 years. Alerts filtered to within forest using the ancillary dataset (GLAD Primary). Presence of alert in 2 km buffer around plot as a simple proxy for local deforestation risk.

Dataset name	Preparation script	Asset Id	Description of zonal statistics applied
TMF_plant	jrc_tmf_plantations.py	ee.ImageCollection('projects/JRC/TMF/TransitionMap_Subtypes')	Select classes representing any type of plantation (i.e., classes 81-86).
Oil_palm_Descals	creaf_descals_palm.py	ee.ImageCollection('BIOPAMA/GlobalOilPalm/v1')	Mosaic image collection into a single image. Selected classes from the "classification band" representing Industrial and Smallholder closed-canopy oil palm plantations(i.e. classes 0 and 1).
Oil_palm_FDaP	fdap_palm.py	ee.ImageCollection("projects/forestdatapartnership/assets/palm/palm_2020_model_20231026");	Binary layer. For select countries only (currently unpublished data).
Cocoa_ETH	eth_kalischek_cocoa.py	ee.Image('projects/ee-nk-cocoa/assets/cocoa_map_threshold_065')	Binary product where 1 represents cocoa. Product derived from a cocoa probability map where the recommended threshold of >65%, had already been applied.
WDPA	wcmc_wdpa_protection.py	ee.FeatureCollection("WCMC/WDPA/current/polygons"); Ancillary raster (template): ee.Image("UMD/hansen/global_forest_change_2022_v1_10");	Select all protected area polygons, apart from those with a status of 'Proposed' or 'Not Reported' or designation of 'UNESCO-MAB Biosphere Reserves' (following the WDPA User Manual and https://www.protectedplanet.net/en/resources/calculating-protected-area-coverage). Rasterised to 30 m resolution (using ancillary template dataset).
Country	gadm_countries.py	ee.FeatureCollection("projects/ee-andyarnellgee/assets/p0004_commodity_mapper_support/raw/gadm_41_level_1"); Ancillary raster (template): ee.Image("UMD/hansen/global_forest_change_2022_v1_10");	Rasterised using the 'fid' column at 30 m resolution (using ancillary template dataset). The most common 'fid' value in a given plot used to determine country allocation.

Source: 17-01-2024 https://github.com/forestdatapartnership/whisp/blob/main/parameters/lookup_gee_datasets.csv

APPENDIX 3. ABOUT SAFE AND THE EUDR REGULATORY REQUIREMENTS

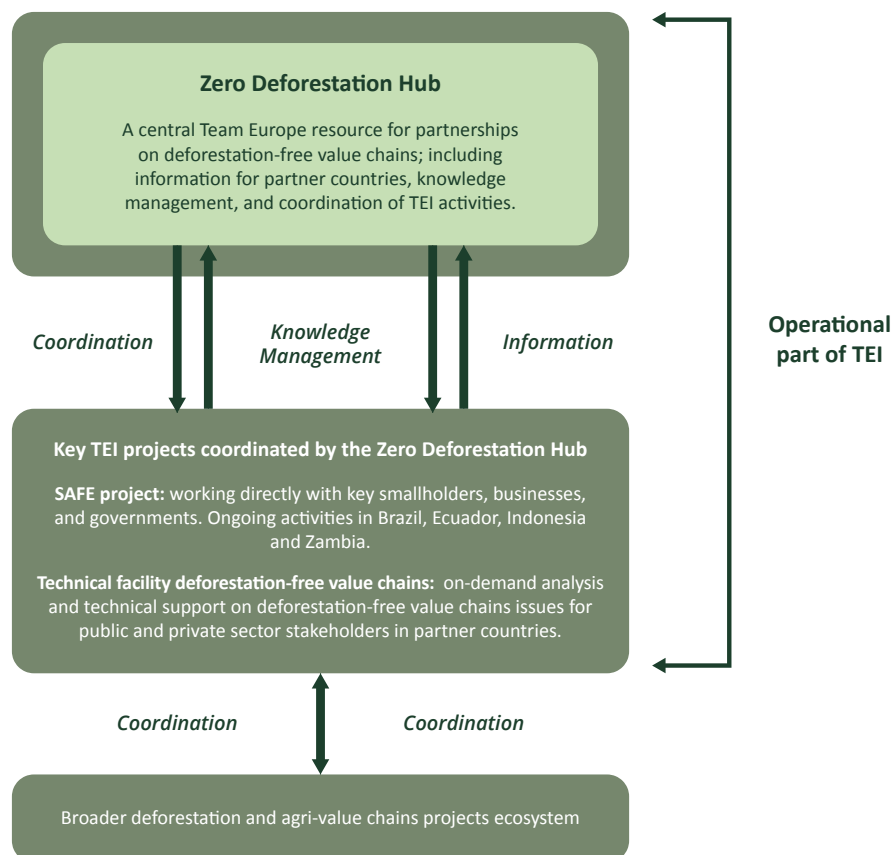
The EU Deforestation Regulation (EUDR) mandates that companies introducing agricultural products to the EU market must demonstrate that the production origin has not contributed to deforestation. With the regulation coming into effect on 31/12/2024, there is a pressing need for agricultural producers, trade, and industry to establish effective mechanisms to support compliance claims and prevent exclusion from the EU market. By the end of 2024, operators trading cattle, cocoa, coffee, oil palm, rubber, soybean, wood and their derived products to or from the EU, will have to present due diligence that ensures deforestation-free and legal production.

There are technical difficulties towards undertaking such due diligence on deforestation of commodity production, especially for the most vulnerable market participants: smallholders, indigenous peoples and local communities.

The technical needs to enable risk assessment include, at least:

- Information on geolocation of production sites
- Information on land use, forest cover and deforestation

The Sustainable Agriculture for Forest Ecosystems (SAFE) program, co-funded by the EU and the BMZ and implemented by GIZ, aims to facilitate an inclusive transition towards deforestation-free and legal value chains in preparation for the EUDR. The project provides enhanced technical assistance, and capacity building based on the needs in partner countries in creating and enabling environment to ensure access to the EU market. Expected areas of work include needs assessments, geolocation, land-use mapping and traceability systems.



APPENDIX 4. ABOUT THE FOREST DATA PARTNERSHIP, THE AIM4FORESTS PROGRAMME AND AGSTACK

The Forest Data Partnership (FDaP) strengthens collaboration and application around global monitoring of commodity-driven deforestation, forest degradation and restoration efforts across the globe. Governments and companies around the world are pledging to help end deforestation and accelerate restoration in order to avert the worst impacts of climate change, protect against biodiversity loss and safeguard the many benefits of forests to people and nature.

FDaP aims to halt and reverse forest loss from commodity production by collaboratively improving global monitoring and supply chain tracking and accelerating restoration. It aligns partners around the data and ensures access for stakeholders across sectors to consistent, validated open-source geospatial forest-risk commodity data. The result is credible, systematic monitoring, verification and accountability towards progress in reducing commodity-driven deforestation and restoring degraded lands.

Under the AIM4Forests Programme, the FAO works with funding from the United Kingdom to accelerate country capabilities in forest monitoring as a part of global efforts to stop deforestation and forest degradation, and restore forests. This also includes supporting forest monitoring systems that can enable effective due diligence against consumer-side deforestation requirements. Countries need dedicated tools and platforms, such as *Whisp*, as well as technical assistance to develop datasets and processes in support of deforestation-free commodity production.

AgStack is an open-source digital infrastructure project for the world's agriculture ecosystem, under the umbrella of the Linux Foundation. It aims to create a common, neutral, and open digital infrastructure that can enable content creation and consumption at scale in the agricultural and forestry ecosystem. It will leverage existing technologies such as agriculture standards, public data, models, and open-source projects. It is intended to be used by a wide range of stakeholders in the agricultural ecosystem, including farmers, agricultural companies, researchers, and government agencies.

