



Tropentag, September 11-13, 2024, hybrid conference

“Exploring opportunities ...
for managing natural resources and a better life for all”

Terra-i⁺: Satellite-based innovation to monitor agroforestry supply chain sustainability

MINH PHUONG NGUYEN¹, THIBAUD VANTALON¹, PHUONG LUONG THI¹, TIFFANY TALSMAN¹,
LOUIS REYMONDIN², GIANG PHAM¹, THUY NGUYEN THI THU¹

¹*The Alliance of Bioversity International & CIAT, Vietnam*

²*The Alliance of Bioversity International & CIAT, France*

Abstract

The EU Deforestation-free Regulation (EUDR) has created an increasing geospatial traceability pressure on agribusinesses exporting to the EU. However, there are inherent shortcomings in existing global earth observation datasets as they often lack the precision necessary for local level analysis. As those datasets often rely on data collected in well documented areas, they run the risk of badly representing vulnerable remote communities. By applying an innovative statistical method and custom artificial intelligence to freely available satellite imagery, Terra-i⁺ establishes a robust methodology to produce high-precision crop-specific datasets that allow for analysis at the farm level, including (1) tree crop cover maps and (2) maps of shade, coffee, and visible soil.

In addition, Terra-i⁺ lowers the capacity barriers to access such geospatial datasets by designing user-friendly interface and creating tailored metrics, such as EUDR compliance, certification compliance, shade tree coverage, and opportunity areas for agroforestry. These metrics enable agribusiness users to make informed decisions about their supply chain, thus increasing transparency and reducing vulnerability of smallholders in the supply chain. Terra-i⁺ metrics and interface were designed through an iterative prototyping process with agribusinesses as the test users. This process includes identifying key users, shortlisting metrics that most closely meet industry's needs, and multiple rounds of tests and refinements, applying design principles to bridge the gap between science and application.

Terra-i⁺ is currently in use by a global coffee trader. Its innovations help agribusinesses manage deforestation risks in their supply chain and meet carbon commitment, thus actively contributing to the global SDGs 12 (Sustainable production and consumption) and SDG 15 (Life on land).

Keywords: Agroforestry, deforestation, EUDR, innovation, iterative prototyping, remote sensing