EARTH OBSERVATION FOR SDG TARGETS AND INDICATORS, LOT-1

SDG 15.2.1 EO PATHFINDER: EO FOR SUSTAINABLE FOREST MANAGEMENT

D8.2 Policy Briefs (for SDG decision makers)

ESA Contract No: 4000139583/22/I-DT
IABG Ref.: TA-B-006186
Date: 2025/05/16
Issue: v2.0

E04SDG-Forest

SUSTAINABLE FOREST MANAGEMENT

< PAGE INTENTIONALLY LEFT BLANK >

1 Summary

Forests play a vital role in climate regulation, biodiversity conservation, and sustainable development. Under the UN's Sustainable Development Goals (SDGs), Goal 15: Life on Land calls for the protection, restoration, and sustainable use of terrestrial ecosystems. However, many countries lack the technical and institutional capacities to monitor and report on forest-related indicators—especially SDG indicators 15.1.1 (forest area) and 15.2.1 (progress toward sustainable forest management). Earth Observation (EO) technologies offer a practical, scalable solution for enhancing national monitoring and reporting capabilities. This brief advocates for the systematic adoption of EO tools in national forest monitoring systems, identifies key implementation challenges, and offers targeted policy recommendations to improve SDG reporting and forest governance.

2 Context

All UN member states are committed to achieving the SDGs by 2030. Goal 15 emphasizes sustainable forest management, with indicators 15.1.1 and 15.2.1 forming the backbone of global forest tracking efforts. The FAO, as custodian agency, depends on national data for global reporting via the Forest Resources Assessment (FRA) programme. Yet, data gaps, technical barriers, and institutional fragmentation often undermine the reliability and consistency of national reports.

Recent pilot initiatives involving Vietnam, Ethiopia, and a Central African NGO have shown that EO-based solutions—especially those utilizing high-resolution satellite imagery—can provide timely, objective, and consistent data for forest area change and degradation. These approaches complement traditional forest inventories, offer cost-efficiency, and are particularly effective in data-scarce and hard-to-access regions.

The project aimed to support reporting and decision-making under UN Sustainable Development Goals (SDG) 15, specifically focusing on sustainable forest management bridging the gap between advanced EO technologies and the practical needs of national and international stakeholders involved in forest management and SDG reporting.

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

3 Analysis and Discussion

The adoption of EO technologies in forest monitoring has matured significantly. Projects have demonstrated that advanced EO workflows—based on machine learning, radar/optical satellite data, and cloud platforms—can deliver accurate, scalable metrics on forest cover, biomass, forest condition, and land degradation. For instance, Vietnam's integration of EO into its National Forest Inventory has contributed to reforestation gains and improved REDD+ compliance.

A robust and high-quality **indicator framework** can aid the global and regional SDG reporting frameworks. Prospective candidates as indicators tracking progress towards SDG:

- Forest Mask
- Above Ground Biomass
- Forest Condition Monitoring
- Erosion and Landslide Risk
- Landscape Metrics

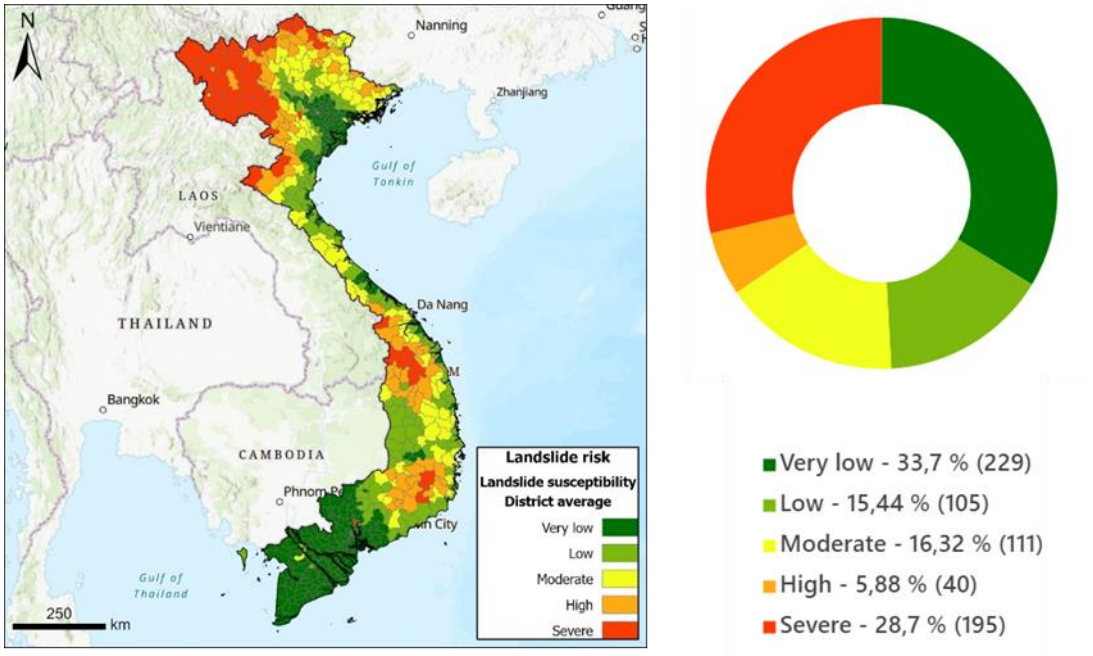

Figure 1. Soil Erosion Risk etimate on district level in PR Vietnam

The indicator framework offers forestry officials a streamlined approach to augment traditional reporting with additional spatial metrics. By incorporating these additional indicators, forestry departments can support national SDG commitments with a more comprehensive view of forest health and resilience. Through these steps, forestry officials can add valuable insights into forest sustainability assessments, informing more effective policies for sustainable forest management and conservation.

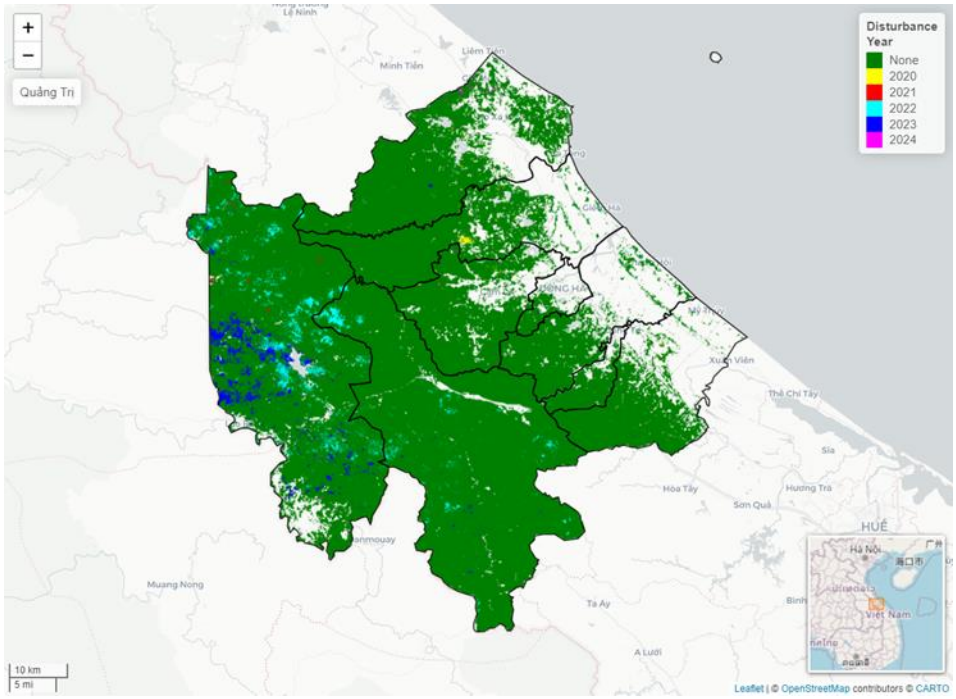

Figure 2. Forest delineation and disturbance events (2020-2024) at province level in PR Vietnam

The indicator framework can aid in national forest **monitoring strategies.**

Use Cases:

- Provide insight into SDG-relevant forest dynamics.
- Cross-reference standard SDG-reporting
- Share results in support of regional development and decision making.
- Provide critical review on existing sustainability policy.

Possibility to **monitor historical development** of landscapes. Forest Landscape Metrics (FLM) provides an unbiased estimate of landscape characteristics which can be used to track the anthropogenic pressure on forest habitats.

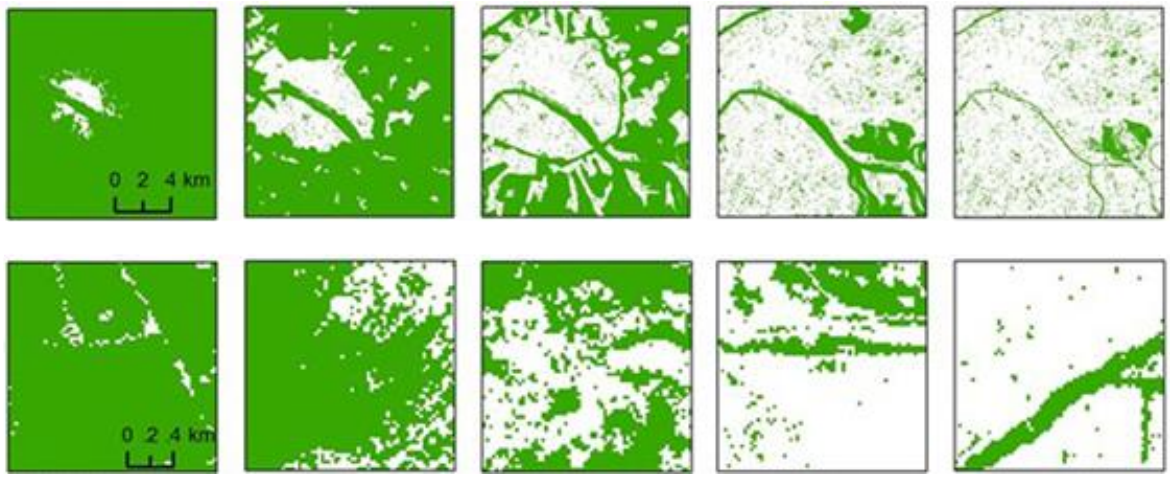

Figure 3.Example of landscape fragmentation. Alongside reduction of forest, the fragmentation of landscape can be measured

A Forest Mask at **national scale** can be used to verify the total forest cover and track the development of forest throughout the years.

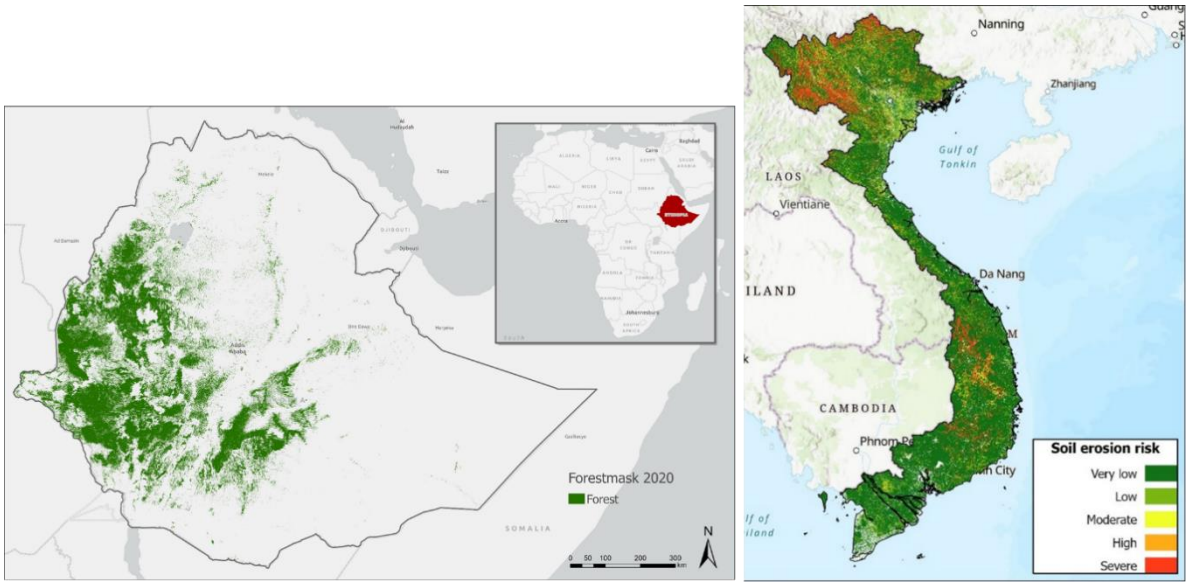

Figure 4. Forest cover at national level

4 Key Considerations

- Capacity Building

Integration of EO into national monitoring systems requires a workforce trained in geospatial data analysis, EO applications, and SDG reporting. Training programs must be sustained, locally embedded, and tailored to national reporting structures.

Figure 5. Discussion on national foresty initiatives during the EO4SDG Living Lab.

- Institutional Integration and Policy Alignment

EO workflows must be aligned with existing legal mandates and policy frameworks. Encouraging inter-agency collaboration and clarifying data governance roles will be critical to enabling institutional uptake.

- Open Standards and Interoperability

Promoting open data standards and ensuring that EO platforms are interoperable with national systems will improve data integration and reduce dependency on proprietary solutions.

- Data Accessibility and International Support

Enhanced access to EO data, particularly through cloud-based platforms, can help countries overcome infrastructure limitations. The role of international actors, including ESA and FAO, is crucial in funding, standardization, and fostering collaborative ecosystems.

5 Recommendations

- National governments should formally integrate EO technologies into their SDG 15 reporting mechanisms, with a focus on indicators 15.1.1 and 15.2.1, by adopting EO-based workflows in forest monitoring programs.
- Invest in long-term capacity building, including technical training, user-friendly platforms, and institutional mentoring, supported by international agencies such as ESA and FAO.
- Mandate interoperability and open data standards in public procurement of EO solutions to ensure compatibility with national databases and statistical workflows.
- Develop and enforce national data-sharing policies that facilitate inter-agency cooperation and transparent access to geospatial data for SDG reporting.
- Support the scaling of proven EO solutions through policy alignment, cloud infrastructure development, and localized pilot programs that validate EO tools under national conditions.

6 Conclusion

With just a few years remaining to meet the 2030 Agenda, accelerating the adoption of EO in forest monitoring is both urgent and achievable. The demonstrated success of EO solutions in Vietnam and other pilot countries provides a replicable model for integrating technology into sustainable forest governance. National policies that support EO adoption—through capacity building, data governance, and platform interoperability—will unlock more accurate, efficient, and transparent reporting on SDG 15, ultimately contributing to better forest management and stronger climate outcomes.

Open Earth Observation satellite imagery, with its global coverage and high observation frequency, can prove essential in monitoring the environmental dimension of sustainable development.

An indicator framework offers opportunities to modernise national statistical systems and improve capacities of countries to track sustainable development.

< END OF DOCUMENT >