LINKING EARTH OBSERVATIONS WITH CAPACITY BUILDING AND MEASUREMENT, REPORTING AND VERIFICATION NEEDS

GFOI Session on Tropical Forest Monitoring

Living Planet Symposium

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BACKGROUND ON EARTH OBSERVATIONS IMPORTANCE FOR MRV

Robust MRV (Measurement, Reporting, and Verification) systems are central to tracking forest-related greenhouse gas emissions and removals under the Paris Agreement, REDD+, and voluntary carbon markets.

Earth Observation (EO) technologies, including satellite imagery, time-series analysis, and cloud computing, offer scalable and cost-effective tools for forest monitoring.

Fully integrating EO into national MRV systems requires targeted and sustained capacity building.

EO DATA NEEDS

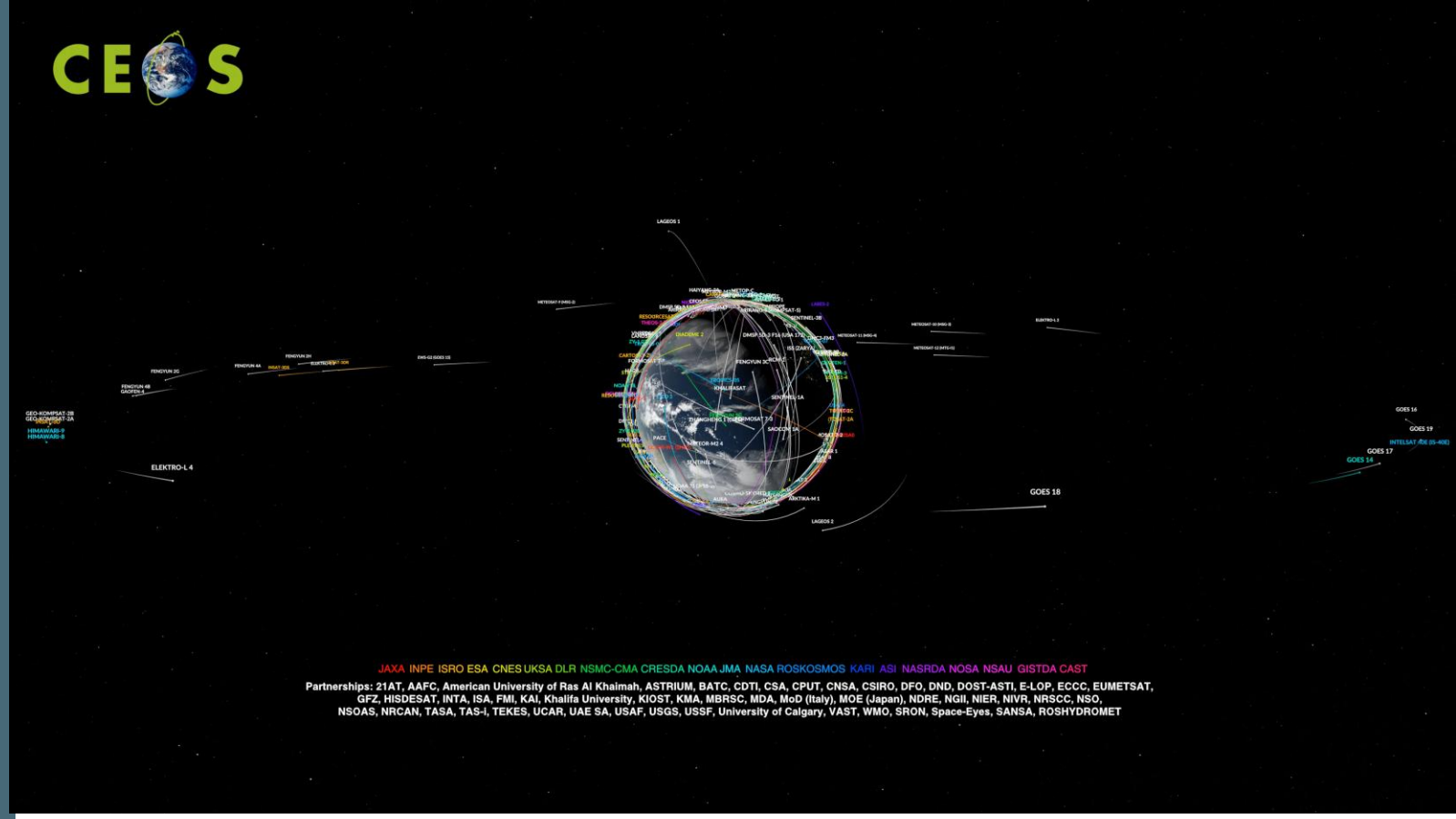
- UNFCCC, GHGi
- Reference level in the framework of REDD+ initiatives.
- Sustainable Development Goals SDGs:
- Requested by different entities
- NGOs, academia, sectoral entities, among others.

UN-REDD PROGRAMME

UNFCCC

SUSTAINABLE DEVELOPMENT GOALS

ipcc INTERGOVERNMENTAL PANEL ON climate change



CEOS Fleet 2025. More than 60 CEOS Members and Associates take part in collaborative missions and data systems to benefit society. Color-coded satellites are operated by a single agency, while white satellites represent those operated through partnerships between multiple CEOS organizations. Credit: NASA Scientific Visualization Studio.

CHALLENGES FOR DEVELOPING COUNTRIES USING EO FOR MRV

Technical Capacity
Limited expertise in geospatial analysis, IPCC MRV protocols, or interpreting EO data.

Definitions
Established precise and uniform definitions that fit all their reporting requirements.

Institutional Fragmentation
Responsibilities split across ministries with minimal coordination or shared protocols.

Staff Turnover
Trained personnel leave often, requiring repeated training and loss of institutional knowledge.

Metadata
Lack of metadata to make replicable products.

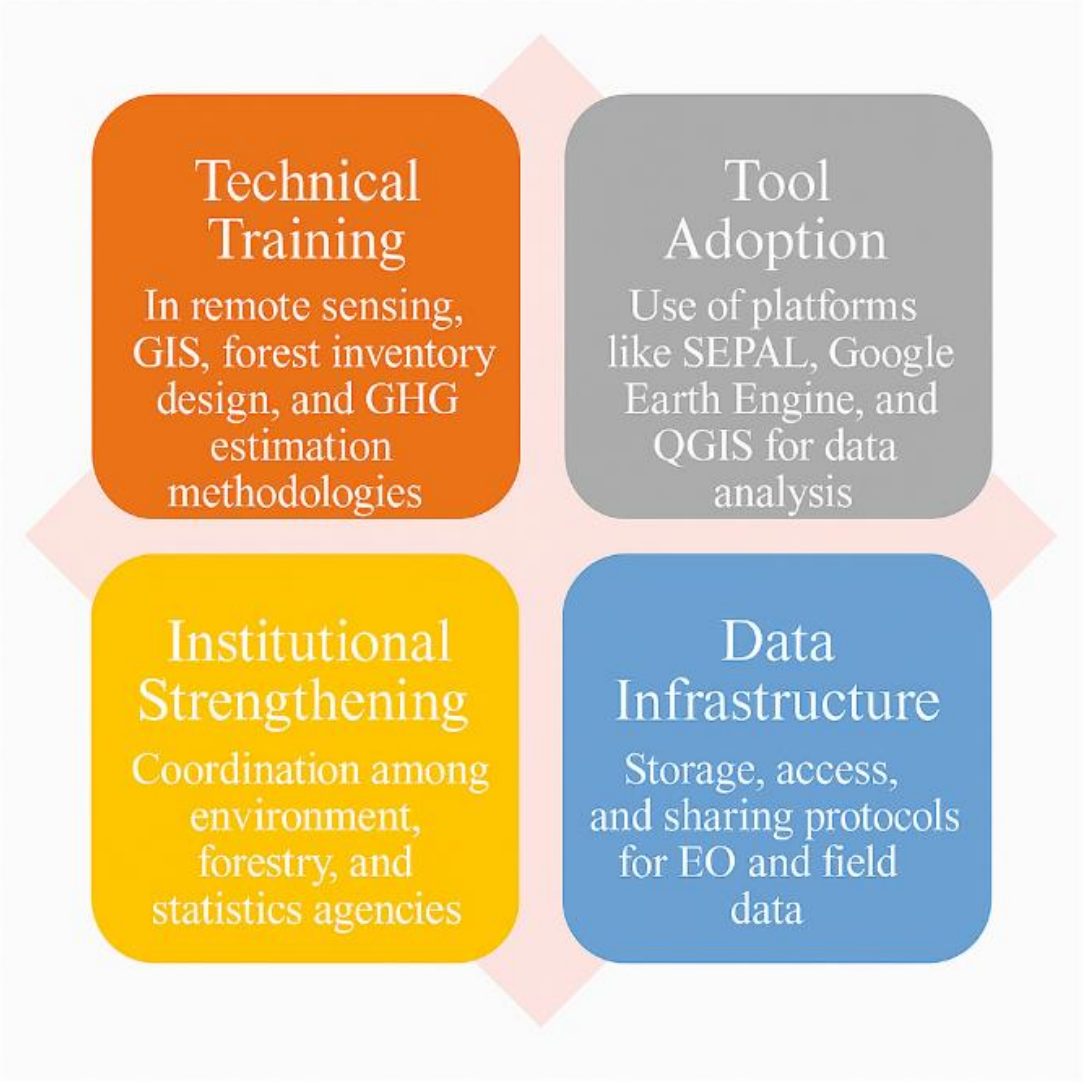
External Dependence
Data sustainability. Discontinuation of the satellite missions.

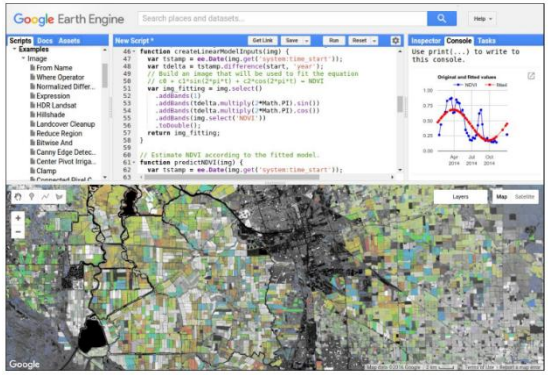
Infrastructure
Weak internet, lack of cloud access, no central data storage or high-performance computing.

Data Sovereignty
Resistance to cloud tools due to privacy, security, or dependency concerns.

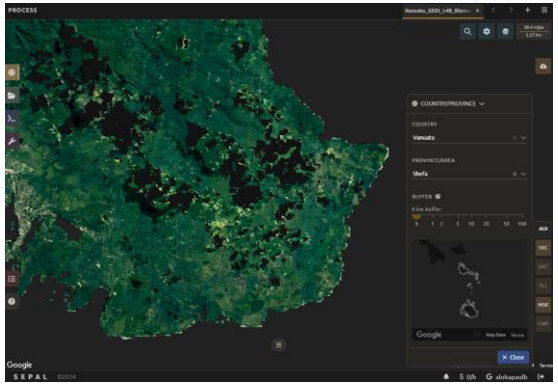
Unsustainable Financing
Systems depend on short-term donor funding; no national financial commitment.

IMPORTANCE OF CAPACITY BUILDING IN EARTH OBSERVATIONS





A) Google Earth Engine – requires coding in JavaScript



(B) SEPAL – has a graphical user interface, quicker to learn, similar capabilities

IMPORTANT:

Customized global products
Calibrate global datasets
Use country specific data for iteration

IMPORTANCE OF RESEARCH IN EARTH OBSERVATIONS

1.National Ownership and Sustainability

When local researchers and institutions are directly involved in EO data generation, analysis, and interpretation, it strengthens the ownership and long-term sustainability of monitoring systems.

2.Contextual Accuracy and Relevance

Country-led research ensures that EO applications are tailored to national priorities, and policy frameworks. Local knowledge improves land cover classifications, emission factor estimations, and the integration of EO with ground data.

3. Improved Data Validation and Credibility

Local researchers are essential for conducting field validation and ground-truthing exercises that improve the accuracy and credibility of satellite-derived products.

4. Policy Influence and Integration

National research institutions often serve as trusted advisors to policymakers, helping bridge science and decision-making. Their involvement ensures EO results are integrated into climate strategies, REDD+ reports, NDCs, and land-use planning.

THANK YOU!
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