

Summary of discussions (1/6)

- **Importance to use appropriate language and words, to communicate efficiently between different stakeholders**
- **GOFC-GOLD was created 20 years ago as a project of CEOS and has become a focal point for global forest and land monitoring**
- **Evolving policy context for land monitoring: climate change, ecosystem services, and now Sustainable Development Goals**
- Rapidly evolving environment stresses the need for GOFC-GOLD and GFOI to strengthen further link between its activities and country / societal needs
- **Growing trend: moving from land cover to land use information, and land management!**
- **Need for free open access of Earth Obs. data for research but also to support business opportunities and services**
- The era of big data notably geospatial data increases further the need to improve land monitoring methods
- Long time series of observations needed to understand and monitor climate change, notably to help untangling different parameters and effects
- **Global-scale land cover products getting routinely produced**
- **Transparency is key to ensure success of policy processes**
- **Importance to develop community consensus (standards, procedures) and guidance**

Summary of discussions (2/6)

- Need for guidance to developing countries on how to use Earth observation data
- **Need for improved access to data, higher time frequency, and accuracy in detecting changes**
- Need for land cover, land use information and other Earth observation-based data streams to understand global scale carbon, water, energy cycles
- Monitoring change in forests is an important component to mitigate climate change, research still needed to reach this goal
- **Global Forest Observations Initiative (GFOI) is a key stakeholder that works on providing support to countries on developing national forest monitoring systems**
- GFOI identified need for GOFI-GOLD to enhance trans-national research collaborations
- **Monitoring solutions needed also for restoration (regeneration), local communities have to be involved**
- **Challenge to fuse different data streams (EO, socio-economic data)**
- **Uncertainty in (change) estimates is a challenge, notably for result-based finance schemes. (World Bank)**
- **Sustainable Development Goals: Goal 15: Life on Land, need for land cover time series, 15.1.1 Forest area as a proportion of forest land. Obtaining reliable information is a challenge**

Summary of discussions (3/6)

- **OECD needs Earth observation-derived evidence to support policy making, among these: land cover, land use change, soil information at global scale** (quantify conversion from natural to anthropised environments, incl. fragmentation), <100m spatial resolution, annual. **No dataset available do date that meets these requirements**
- **Unilever developed a sustainable living plan** with 3 pillars on improving health and well being, reducing environment impacts, enhancing livelihood. **Standards, indicators and certifications developed to support these specific objectives. Private sector develops its own set of indicators and remote sensing data is needed also here**
- Global Forest Watch product used to monitor palm oil production: traceability and risk assessment
- **Detailed data needed for impact assessment livelihoods, productivity, biodiversity**
- Earth observation data needed for monitoring of vegetation canopy, foliage analysis, plant water stress
- **Consistency in measurements across time is key to capture changes**
- **Countries have started to report on SDG, report recently submitted to the United Nations**
- **Additional SDG indicators needed**, notably on food production efficiency although countries complain this is too much already. **Addition of a few more is discussed, likely not more than 20-30. Consistency needed also for the indicator list**
- **Key issue of uncertainty in the data SDG indicators are based on. Cost efficiency issue may be unsolvable**
- **How do we improve communication between policy makers and scientific community and data producers? UN GGIM promotes a community of experts to help augment input of geospatial information to SDG indicators.**

Summary of discussions (4/6)

- **SDG: need to share technology** (e.g., open source software tech.) to help countries
- Need to agree on definition of phenomenon you want to monitor (e.g., deforestation, degradation), but more importantly need to estimate associated uncertainty of estimates, and ensure consistency in measurements across time
- Several capacity development initiatives by NASA LCLUC projects in SE Asia,
- Landsat-Sentinel Team under NASA LCLUC, with partnership with ESA, jointly with research labs, and other Space agencies (DLR...)
- **Many stakeholders in field of capacity development including SERVIR, SilvaCarbon, GOF-C-GOLD, FAO networks, coordination done but needs to be developed further, to avoid duplications, improve efficiency (expert availability, costs)**
- Multi source land imaging approaches on the rise
- SilvaCarbon capacity development activities supports several countries to establish NFMS, forest inventory, remote sensing, GHG reporting, and advancing research also. No funding of R&D in the future
- **Sentinel-1 and -2 constellations as part of Copernicus Programme provide higher time frequency observations for land monitoring which is key over cloudy regions, no rolling archive policy, data always available, restrictions on number of scenes to be downloaded**
- ESA working on facilitating access to data via Thematic Exploitation Platforms (e.g, Forests) with cloud computing IT solutions

Summary of discussions (5/6)

- Global Forest Watch (GFW) product: 1,000 000 users incl. governments, NGOs, corporates, boundaries of several protected areas available on the platform
- GFW promotes transparency, support near-real time action (against deforestation), and outcome 3
- **Clarification needed on how emission estimates are derived from GW products** and whether guidance from some expert bodies taken into account
- **GEO BON works on biodiversity-related issues. Aichi Targets difficult to achieve because of complexity (ambiguity, difficulty to quantify...).**
- Gaps in biodiversity monitoring capacities. Other GEO activities related to GE BON (e.g., GFOI)
- Essential Biodiversity Variables (EBV) built on Essential Climate Variables, EBV developed to support Aichi Targets
- **Remote sensing EBVs have been developed and overlap with some ECVs. Need for interaction between the different stakeholders involved in the design of such products incl. GOFCC-GOLD, GFOI**
- GEO BON in-a-Box concept to facilitate access to tools, e.g., Biodiversity sourcebook joint project between GOFCC-GOLD and GEO BON
- Planet provides Earth observation data from RapidEye constellation but also 120 micro-satellites
- **Near real time change detection: sensor interoperability is a current challenge**

Summary of discussions (6/6)

- Satelligence (Dutch company) identified the challenge of connecting science with concrete applications that answer questions from various users
- Remote sensing data useful; to monitor changes but also to prevent changes, e.g., of oil palm plantations in unsuitable areas
- **Monitoring challenges: atmospheric corrections (optical data), and rain showers (radar data)**
- Know what you are using: providing easy access to data may lead to misuse, wrong interpretations in some case

Curtis:

- Point 1: Xxxx
- Point 2: Need to move from static and change mapping to continuous monitoring (e.g., forest health, agriculture)

Tony: (see slide!)

- Point 1:
- Point 2: evaluating functions and status instead of extents (same point as Curtis)

General discussion

- GOFC-GOLD achieved its original purpose: develop capacity to observe Earth from Space and make data available
- Need for active dialogue to support SDG and GOFC-GOLD is interested to contribute to it
- Need to invest in capacity building,
- Need to push for transparency
- Science needs to be made further actionable. Use cases have demonstrated this is possible (detecting illegal logging early enough)
- Community based monitoring can be complementary to Earth observation data