GOFC-GOLD
Global Observation of Forest Cover and Land Dynamics
Land Cover Project Office

GFOI
Global Forest Observations Initiative

esa

Activities and Research Priorities of the GFOI R&D Coordination Component

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The recent Paris Climate Agreement[1] emphasizes efforts for reducing emissions from deforestation and forest degradation and enhancing carbon stocks (REDD+) for mitigation of greenhouse gas emissions in developing countries. To help fulfil the monitoring and reporting needs, the Global Forest Observations Initiative[2] (GFOI) fosters actions toward operational national forest monitoring underpinning the Measuring, Reporting, and Verification of REDD+ activities.

Dedicated research and development (R&D) have been instrumental in developing developing technical solutions integrating remote sensing and ground based observations for national forest and GHG monitoring in both developed and developing countries[3]. While R&D activities are happening in their own right, impact for REDD+ countries is best achieved if R&D is embedded in the broader GFOI-set of activities and fed back into countries directly (Fig. 1). The coordination of R&D activities which is one of four components of GFOI focuses on:

1) **Assessing** country needs to define R&D priorities and stimulate dedicated research,
2) **Advocating** for a coordinated, multi-sensor data acquisition strategy to support GFOI related R&D,
2) **Synthesizing** research outcomes in regular updates of guidance documents such as the GFOI Methods and Guidance document (MGD) and the GOFC-GOLD REDD+ Sourcebook,
3) **Developing** REDD+ training materials and fostering their use in joint capacity building activities,
4) **Acting** as expert advisors, and as advocates for robust technologies and approaches, identifying their assets and limitations for REDD+ engagement.

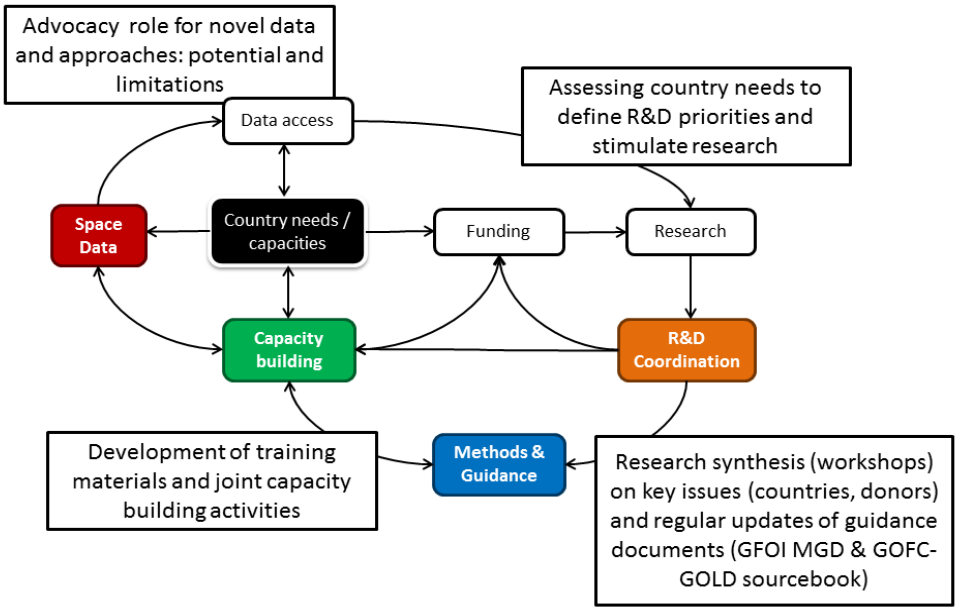

Figure 1: Embedding of R&D coordination within GFOI Components to stimulate research driven by country needs and feed research synthesis in the guidance materials and capacity development.

Figure 1 illustrates how the R&D Component is rooted to the evolving country needs and acts as a catalyst for R&D activities aimed at delivering practical solutions toward operational NFMS. The list of priority research topics is regularly revised to further facilitate research activities through interacting with stakeholders, facilitating remote sensing data access and fostering joint research activities. Dedicated expert workshops are aimed to provide a synthesis of state-of-the-art forest monitoring methods that can be incorporated into the MGD and capacity building materials. The R&D Coordination Component interacts closely with the other GFOI components and external partners engaged in capacity building activities. There is direct communication with space agencies and commercial data providers to facilitate data access to research groups (SDCG Element-3).

The R&D efforts of the GFOI initiated seven years ago, have to be considered in a long-term perspective; such a timeframe being required for R&D practitioners to develop, experiment, and validate techniques that can support country needs for operational NFMS. In 2016, the Land Cover Project Office of the Global Observation of Forest Cover & Land Dynamics (GOFC-GOLD) took the lead of the GFOI R&D Component; thanks to the support of the European Space Agency.
The 2017-2019 Work Plan of the R&D Coordination component aligns with the objectves of the GFOI as a whole, and previous achievements, bringing forward an updated list of priority R&D topics, and a Communication and Assessment Readiness Level (CARL) framework to monitor R&D progress.

1 http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf
2 http://www.gfoi.org/rd/
3 http://www.cifor.org/publications/pdf_files/Books/BWijaya1201.pdf

Assessing Current R&D Priorities and Country Priorities

The assessment of country needs for GFOI and ongoing research activity have led to the identification of priority research topics. Sponsors for REDD+ related research are encouraged to consider these priority topics in their respective programs and calls:

- Monitoring of forest degradation,
- Mapping of different forest types,
- Forest restoration,
- Peatland monitoring,
- Monitoring method cost-efficiency,
- Remote sensing data interoperability and time series consistency,
- Above ground biomass and change estimates,
- Uncertainty estimation, incl., allometric models,
- Data-model integration for estimating emissions,
- Use of novel technologies such as handheld devices, drones and terrestrial laser scanners.

Putting the 2017-2019 R&D Work Plan into action, a series of workshops will be organised. The agreements with the Space Data Coordination Group (SDCG) allowing research groups to access a range of remote sensing datasets will be renewed. These research groups are active in several core sites across the tropics to address the research priorities (Table 1).

Group	Affiliation	Study Site(s) [country]	Sensor data requested									Publicly open & others						R&D topics under investigation							
			SPOT5(Take5)	SPOT 1-5 (archive)	VHR Optical	ALOS-2 PALSAR-2	ALOS-1 PALSAR-1	RADARSAT-2	TerraSAR-X	TanDEM-X	Cosmo-SkyMed	Landsat	Sentinel-1	Sentinel-2	RapidEye	ENVISAT ASAR	Others	Forest type	Forest cover	Deforestation	NRT detection	LC & LLC	Degradation	Biomass/carbon	Interoperability
1	INPE, Brazil	Brazil																					X		X
2	SIRS, France	Malawi																X	X	X			X		X
		Gabon																X	X	X	X		X		X
3	WHRC/BU, USA	Colombia																		X		X	X		X
4	U Wageningen, The Netherlands	Ethiopia																		X	X		X		X
		Fiji																		X	X		X		X
		Peru																		X	X		X		X
5	Guyana Forest Com.	Guyana																					X		X
6	U Wageningen, NL	Indonesia																X		X	X	X	X	X	X
7	U Tromsø, Norway	Tanzania																	X	X				X	X
8	HGC, Malaysia	PNG																		X			X	X	X
9	VTT, Finland	Mexico																	X			X	X	X	X
		Finland																						X	X
10	CSIRO, Australia	Australia																X					X		X
11	UNSW, Australia	Australia																		X		X	X	X	X
12	CFS, Canada	Canada																X	X				X	X	X
13	U Humboldt, Germany	Brazil																		X		X	X	X	X
14	RSS, Germany	Indonesia																		X			X	X	
15	Airbus, Germany	Suriname																X	X	X	X		X	X	
		Indonesia																X	X	X	X		X	X	
		Ghana																X	X	X	X		X	X	
16	CSIR, South Africa	S. Africa																X	X				X	X	X
17	NORUT, Norway	DRC																	X	X					X
18	U Jena, Germany	Mexico																					X		X
		S. Africa																					X		X

*User requirement: Minimum required dataset; Complementary dataset; Available through other sources (not requested through SDCG)

Table 1: Overview of the R&D group activities of the GFOI.

Coordinated Activities and Partnerships

R&D Expert Workshops

Expert workshops are organised to discuss and progress key R&D topics. Agendas and summaries of past workshops are available online.

The **Science meeting** held in The Hague (Autumn 2016) allowed the identification of core topics and issues the R&D Coordination should focus on during the next few years. The summary and conclusions are available online.

The 2017-2019 R&D Work Plan proposes a follow up action plan with a series of workshops to be organised during the next coming years.

Capacity Building Workshops

The R&D Coordination Component engages with internal and external partners for joint capacity development activities. Partners include the GOFC-GOLD Implementation Team, FAO UN-REDD Programme, World Bank, USGS-SilvaCarbon, USAID. The partnerships result in a series of regional "**training the trainers**" workshops. This contributes to an increased visibility and impact of GFOI in the tropical forest monitoring community, and accelerate the progress toward operational NFMS in developing countries.

Objectives:
- Training the trainers: multiplying information to help build capacities,
- Demonstrate the use of various REDD+ training materials,
- Develop country capacity building plans,
- Introduce available tools & further opportunities,
- Eventually: e-learning tools and webinars.

Past workshops:
1st workshop: Asia (EN), 18-22 April, 2016 Bangkok, Thailand,
2nd workshop: Latin America (SP), 4-7 July, 2016, Lima, Peru,
3rd workshop: Africa (EN), 12-23 September, 2016, Addis Ababa, Ethiopia,
4rd workshop: Africa (FR), 6-10 February, 2017, Abidjan, Côte d'Ivoire.

Key partners of the GFOI R&D coordination component:

BOSTON UNIVERSITY

SilvaCarbon

Australian Government

UN-REDD PROGRAMME

FOREST CARBON PARTNERSHIP FACILITY