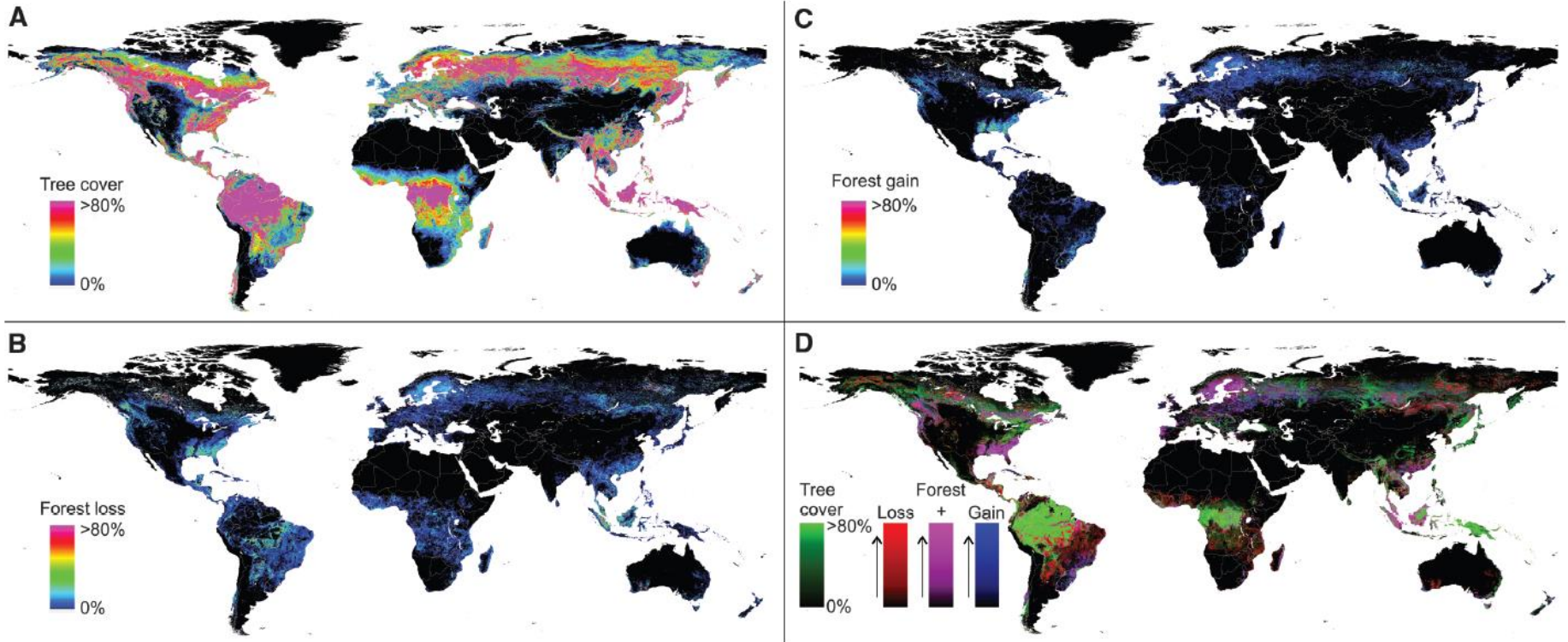


# Use of global data sets for national-level monitoring, reporting and implementation



Martin Herold  
Wageningen University

# Percent tree cover change 2000-14



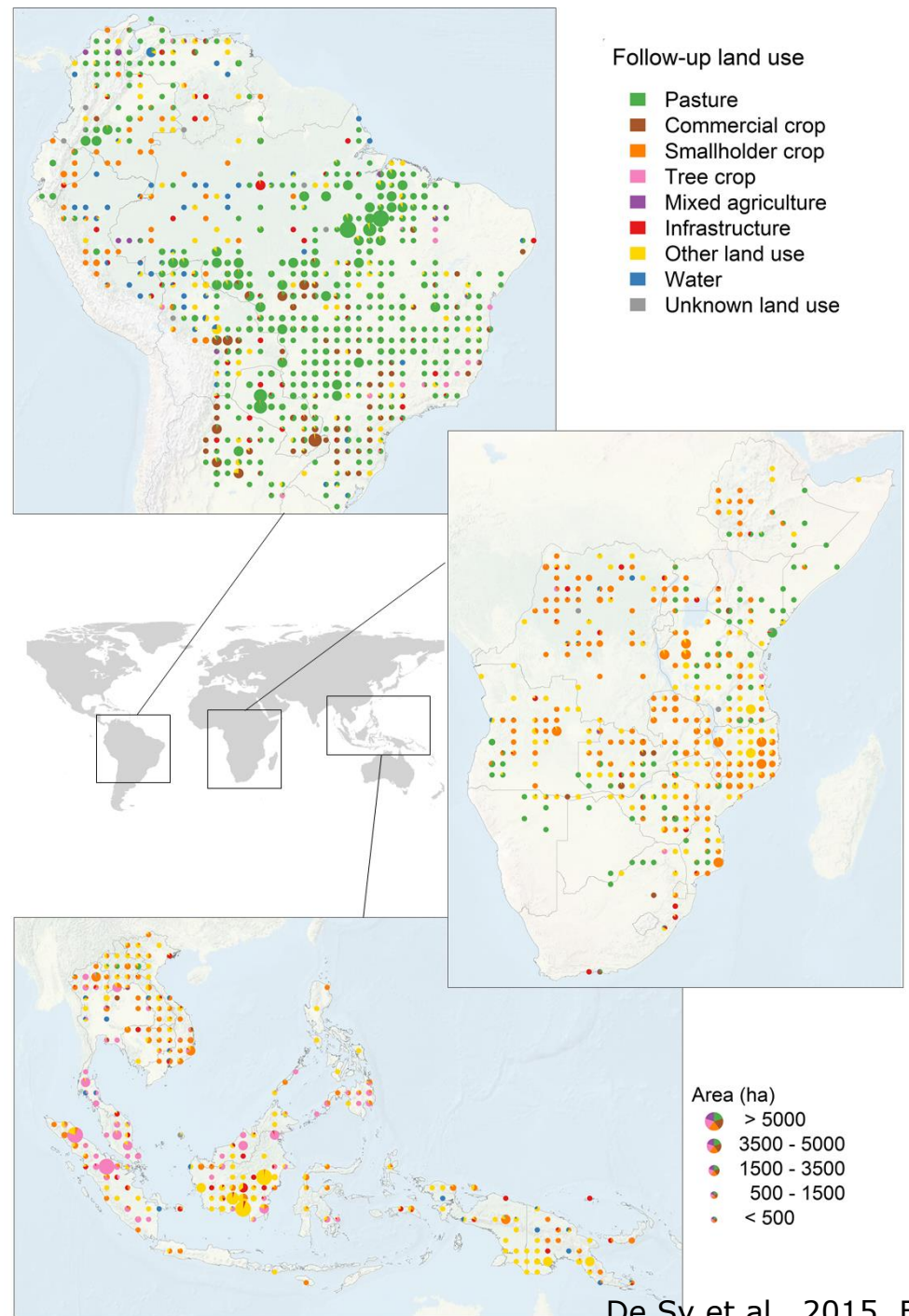
<http://earthenginepartners.appspot.com/science-2013-global-forest>

Global Forest Watch: [www.globalforestwatch.org](http://www.globalforestwatch.org)

# Drivers of deforestation

FAO remote sensing survey data 1990-2005

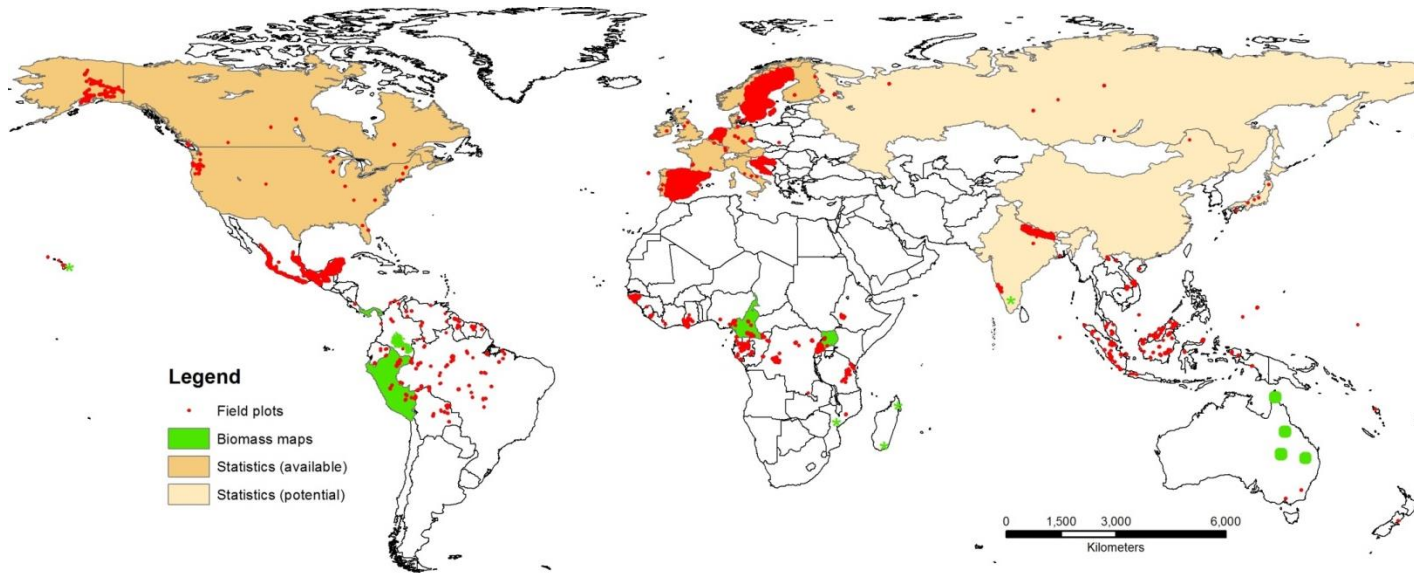
Land use following deforestation 1990-2005	Area (1000 ha)	%
Smallholder crop	12123	18.8
Commercial crop	4326	6.7
Tree crop	5584	8.7
Pasture	27305	42.3
Mixed agriculture	404	0.6
<b>Total Agricult.</b>	<b>49781</b>	<b>77.1</b>
Infrastructure	2210	3.4
Other land use	11230	17.4
Water	1073	1.7
Unknown	200	0.3
<b>Total other</b>	<b>14748</b>	<b>22.9</b>
<b>Total</b>	<b>64529</b>	<b>100.0</b>



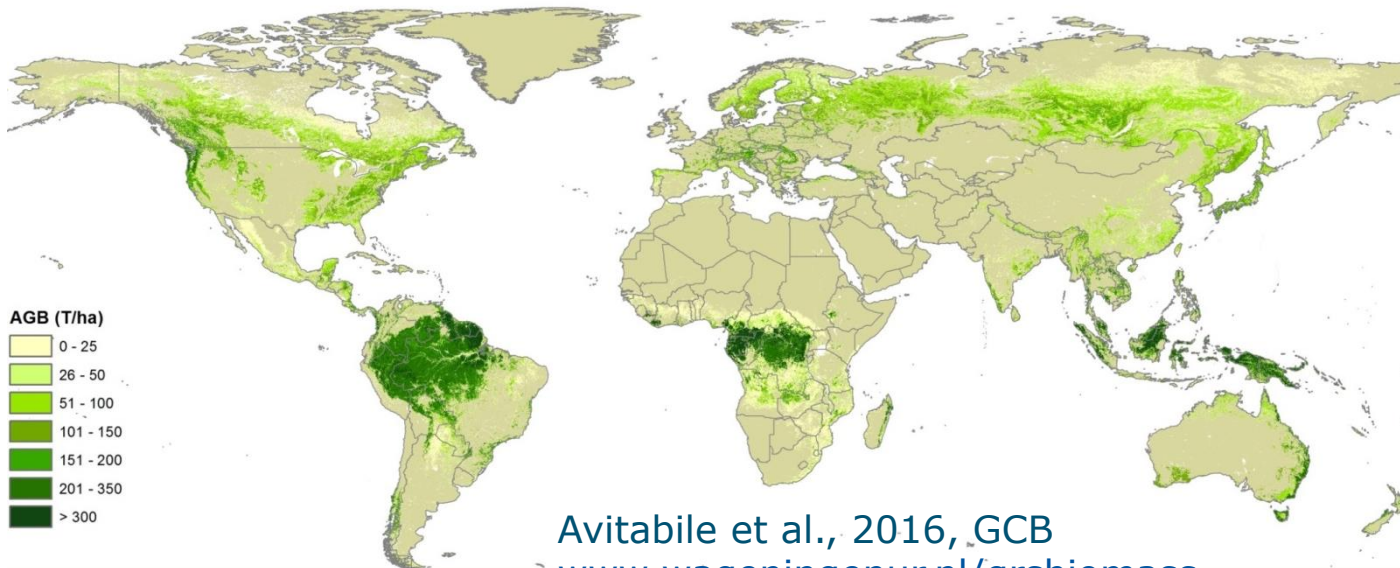
# Mapping forest biomass



[www.globbiomass.org](http://www.globbiomass.org)



Reference data:  
100.000+ plots



Global forest  
biomass

Avitabile et al., 2016, GCB  
[www.wageningenur.nl/grsbiomass](http://www.wageningenur.nl/grsbiomass)

# Post-Paris, the land use sector & monitoring

1. Forests strong in Paris agreement (Art. 5) versus efforts should not harm food production (Art.2)
2. Land use sector is unique in its large negative emissions potential (1,5 -2 degree target):
  - Forests & soils - only proven Carbon Capture & Storage
3. Bottom-up process
4. Monitoring issues:
  - Regular stock-taking by countries
  - Transparency
  - Stimulating and implementing activities
5. Global (assets/data) and national monitoring

## Paris Climate Agreement requirements

## Challenges in monitoring and reporting

Regular stocktaking and reporting

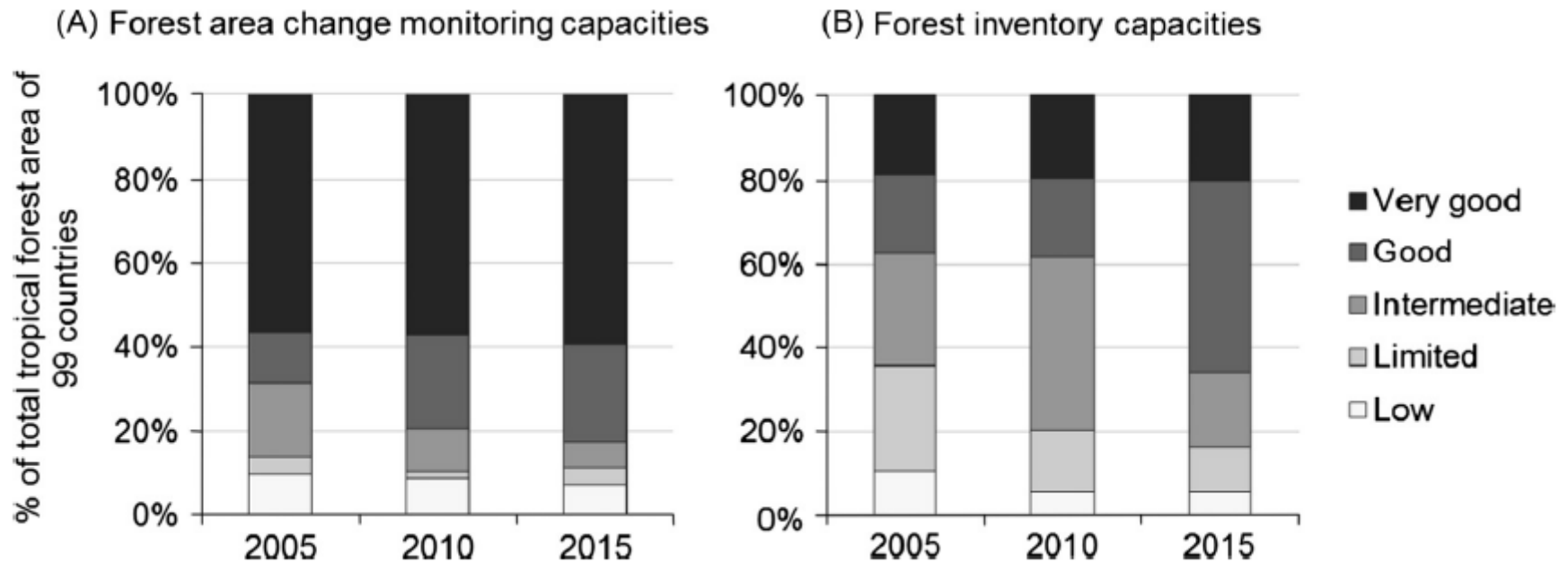
Transparency

Implementation of climate smart land use activities

Challenge 1: improving national GHG reporting



# Increase in tropical country monitoring capacities



## Increase in forest monitoring capacities for FAO FRA 2015

(Source: Romijn et al. 2015, *Forest Ecology & Management*)

- *Increase in capacities leads to change in historical forest net area change estimates; changes historical estimates in sense that poorer capacities have results in estimates that were higher net forest loss in the past*

# Joint capacity building for REDD+ monitoring

## Objectives:

- 14 Modules: lectures, country examples, exercises
- Training the trainers: multiplying information to develop country capacities
- Demonstrate the use various REDD+ training materials
- E-learning tools and webinars
- [http://www.gofcgold.wur.nl/redd/Training\\_materials.php](http://www.gofcgold.wur.nl/redd/Training_materials.php)



1st workshop: Asia (ENG)

Time: 11-15 April 2016

Location: Bangkok, Thailand

2nd workshop: Latin America (SPAN)

Time: 4-8 July 2016

Location: Lima, Peru

3rd workshop: Africa (ENG)

Time: 18-23 September 2016

Location: Addis Ababa, Ethiopia

**4rd workshop: Africa (FR)**

**Time: 6-10 Febr. 2017**

**Location: Ivory Coast**



# Motivations for national use of global data

1. Lack of reliable or official national map
2. As a cross - check of national with global data for consistency/inconsistency or potential errors
3. For stratification for obtaining training data of land use change or biomass measurements
4. For integration in national monitoring and (IPCC compliant) estimation to increase precision and/or reduce costs and create ownership

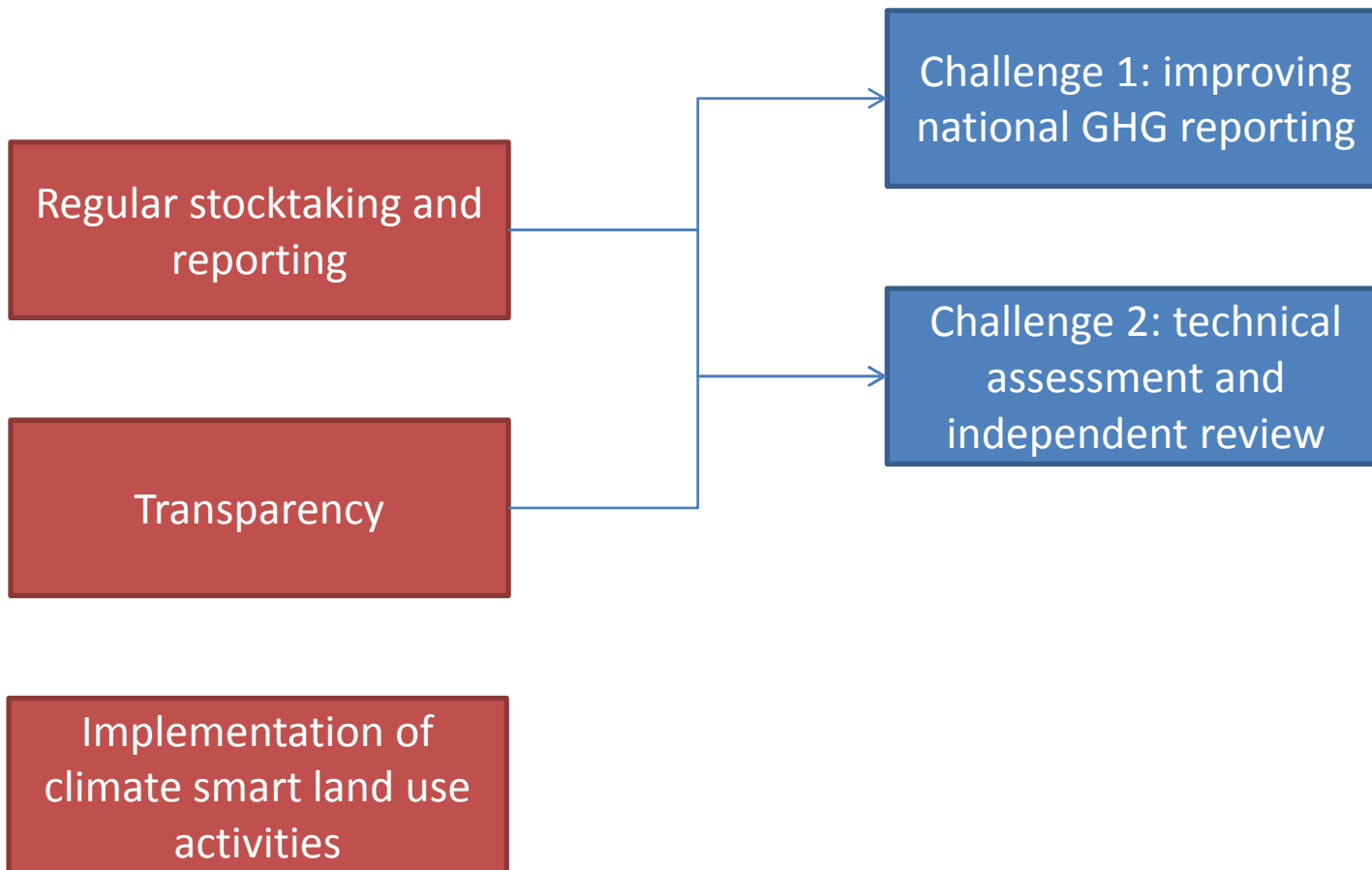
Sources:

GFOI / GOFC-GOLD workshop report: [http://www.gfoi.org/rd/  
http://www.gfoi.org/wp-content/uploads/2016/03/GFOI-GOFC\\_globaldata\\_WSreport\\_03\\_03\\_2016.pdf](http://www.gfoi.org/rd/http://www.gfoi.org/wp-content/uploads/2016/03/GFOI-GOFC_globaldata_WSreport_03_03_2016.pdf)

GOFC-GOLD REDD+ Sourcebook updates on technology: [www.gofcgold.wur.nl/redd](http://www.gofcgold.wur.nl/redd)

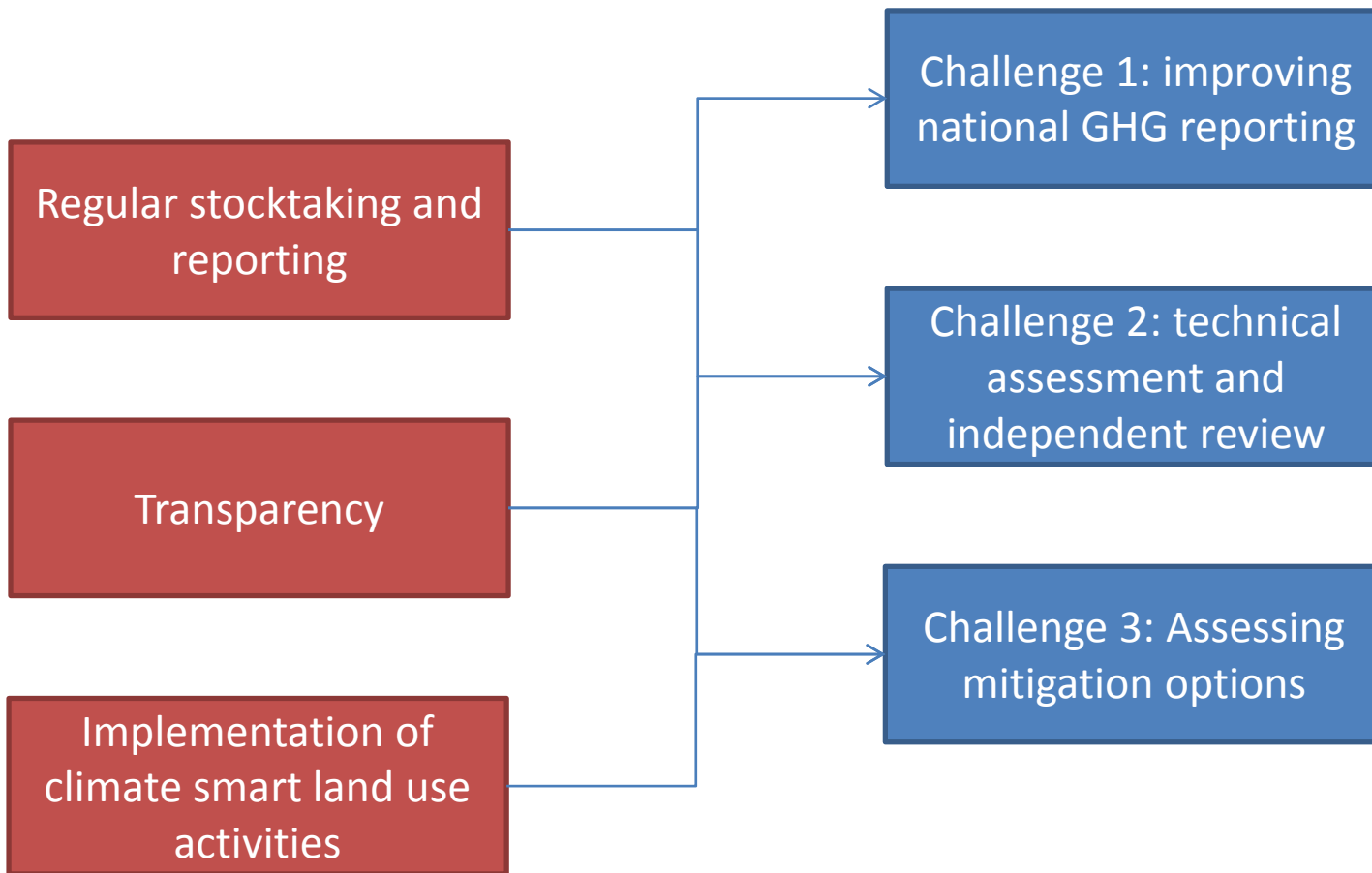
## Paris Climate Agreement requirements

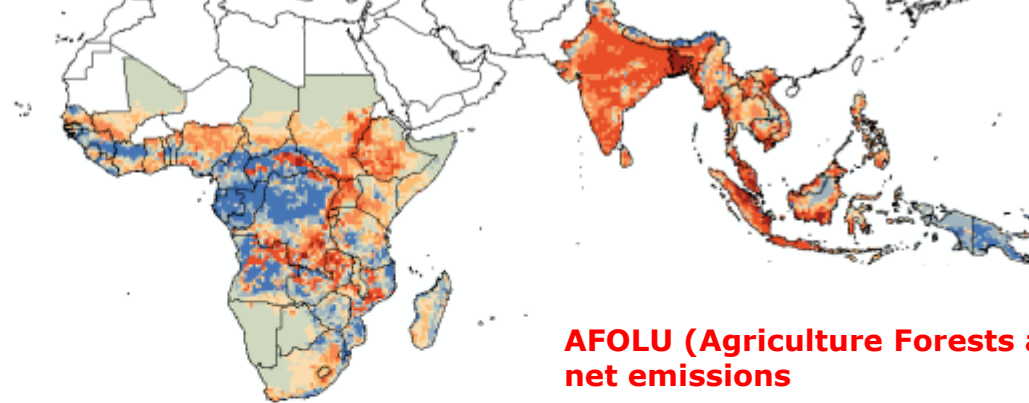
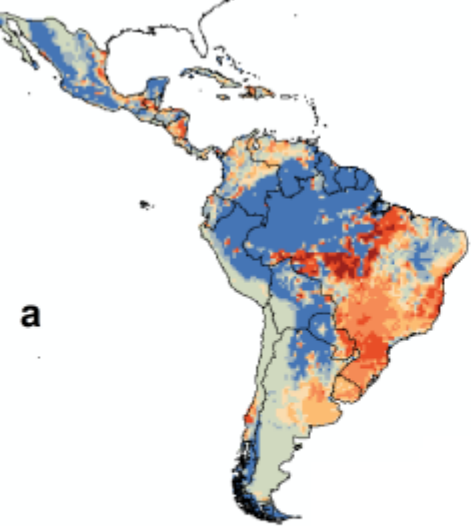
## Challenges in monitoring and reporting



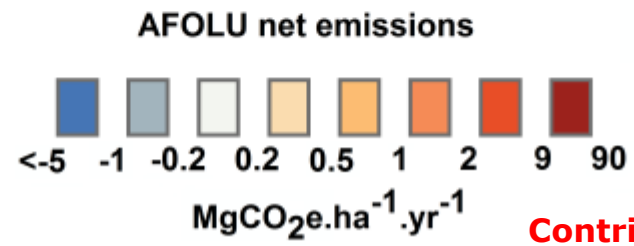
## Paris Climate Agreement requirements

## Challenges in monitoring and reporting

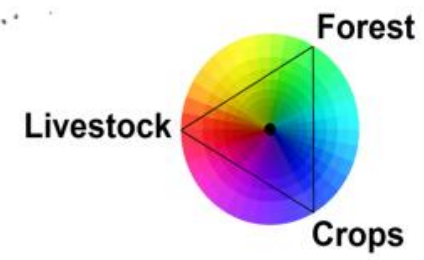
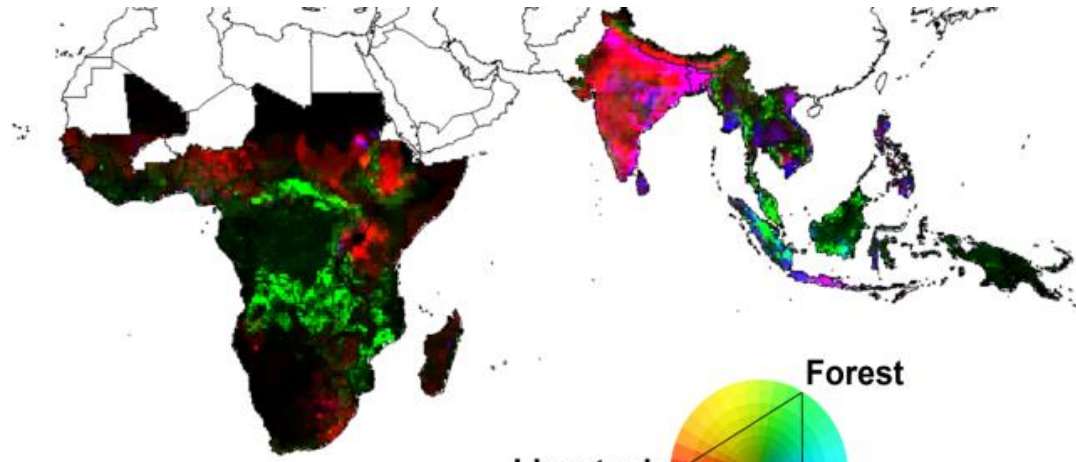




**AFOLU (Agriculture Forests and Other Land Uses) net emissions**

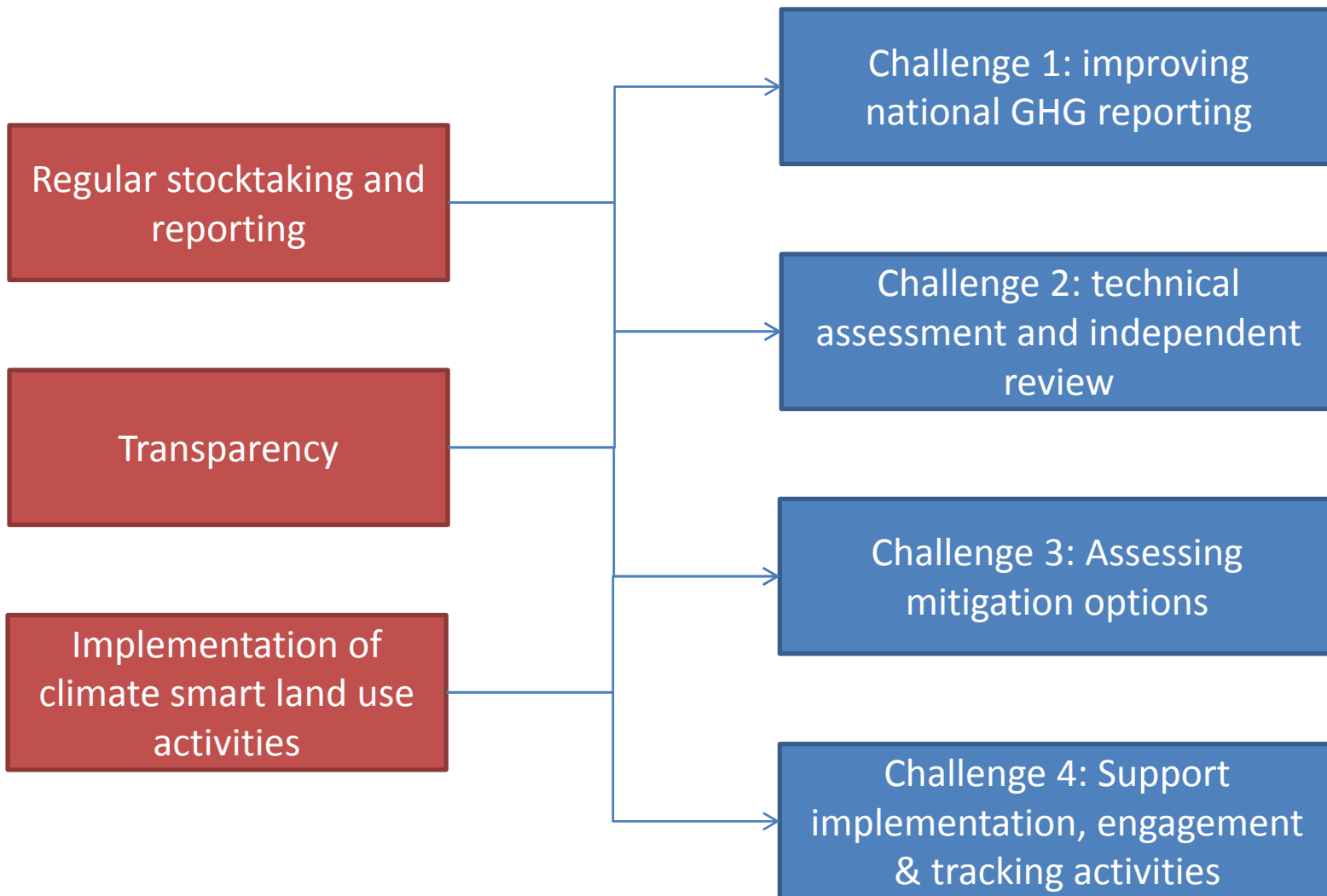


**Contribution of emission sources per pixel (0.5°)**



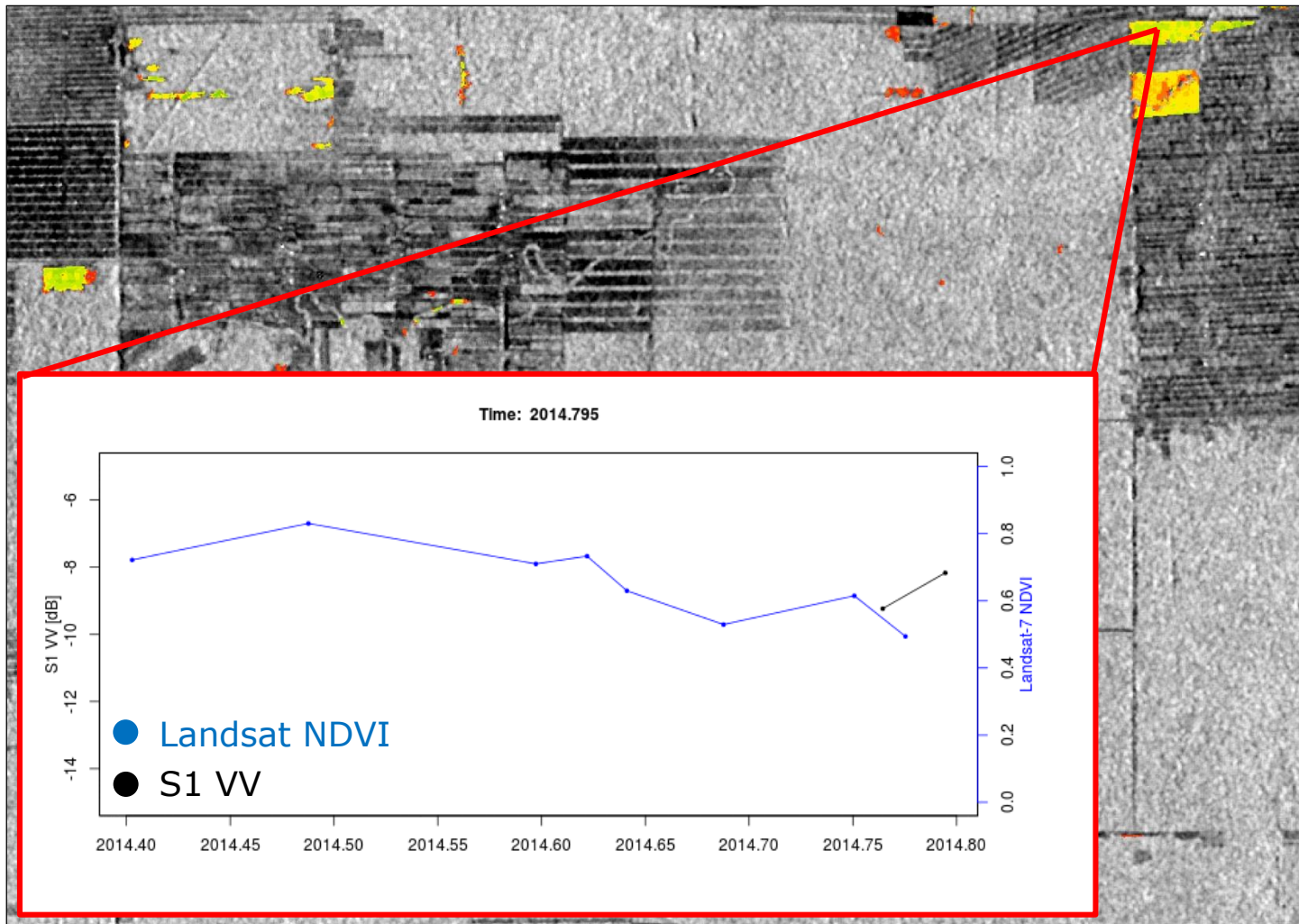
## Paris Climate Agreement requirements

## Challenges in monitoring and reporting



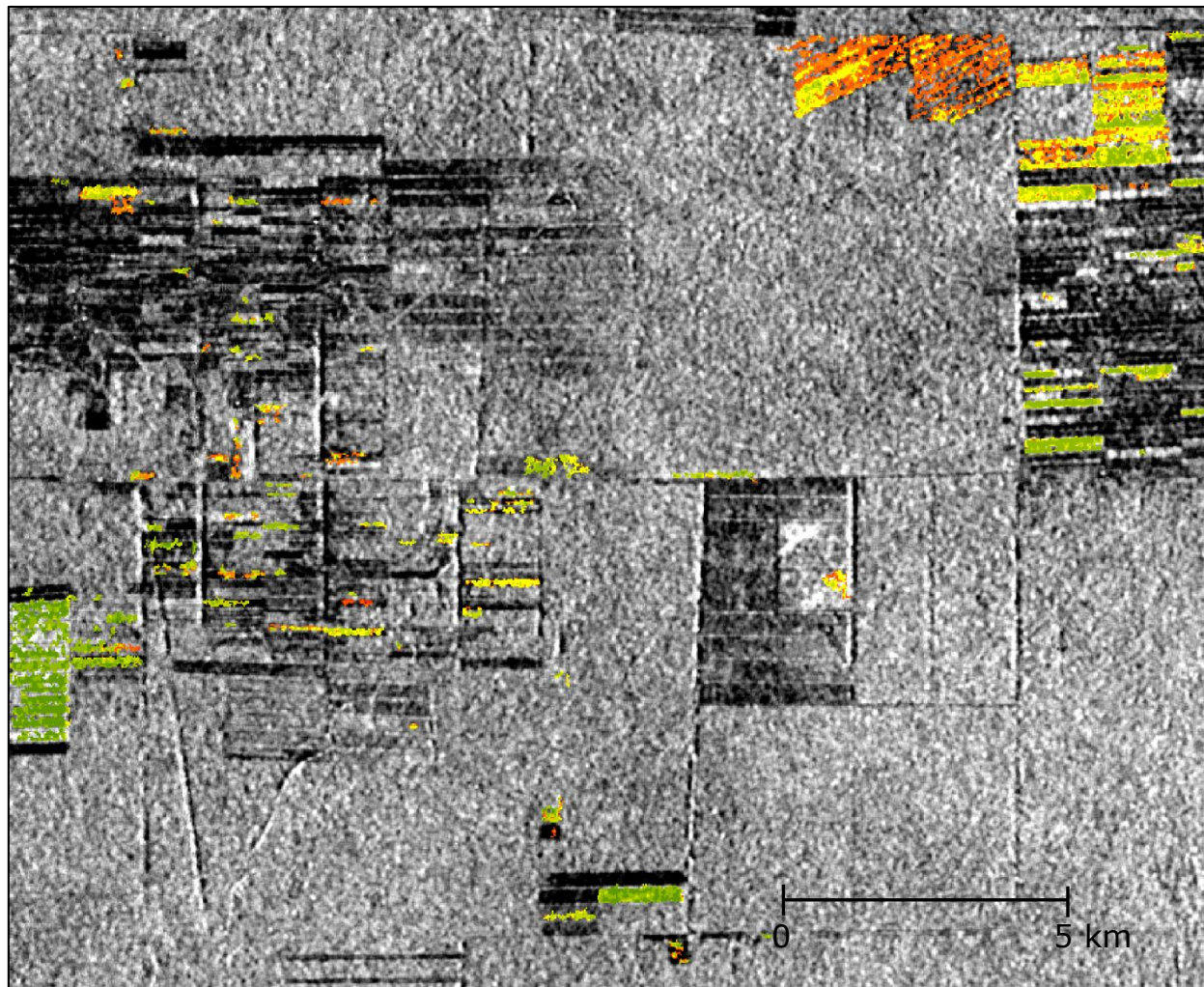
# Combining Sentinel-1 & Landsat (Bolivia)

Fortnightly (two-weekly) monitoring 10/2015 – 04/2016

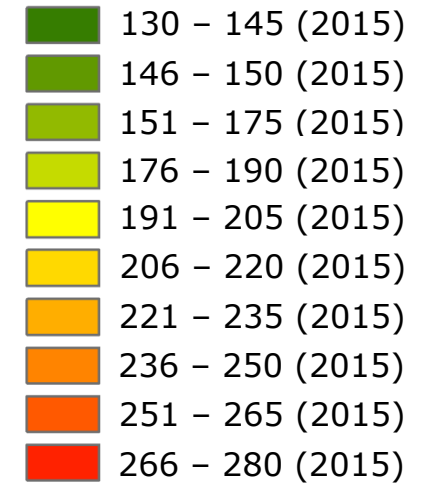


- 2015.288 (10-15)
- 2015.305 (11-01)
- 2015.319 (11-15)
- 2015.335 (12-01)
- 2015.349 (12-15)
- 2016.000 (01-01)
- 2016.015 (01-15)
- 2016.032 (02-01)
- 2016.047 (02-15)
- 2016.062 (03-01)
- 2016.076 (03-15)
- 2016.091 (04-01)
- 2016.105 (04-15)

# Near-real time forest change detection



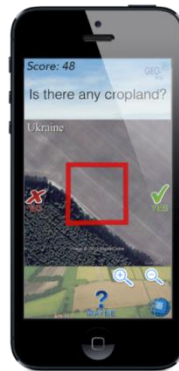
**Time of deforestation**  
Day of year (Year)



■ Example from Bolivia

# Interactive monitoring system design

- Linking near-real time satellite observations with on the ground monitoring by local experts, communities, land managers etc.
- Create an environment of open exchange of information and transparency
- Operational monitoring in Kafa Biosphere Reserve, Ethiopia in near-real time mode since Oct. 2014
- Inception for system at national and local level in Peru – joint research incl. multi-level governance



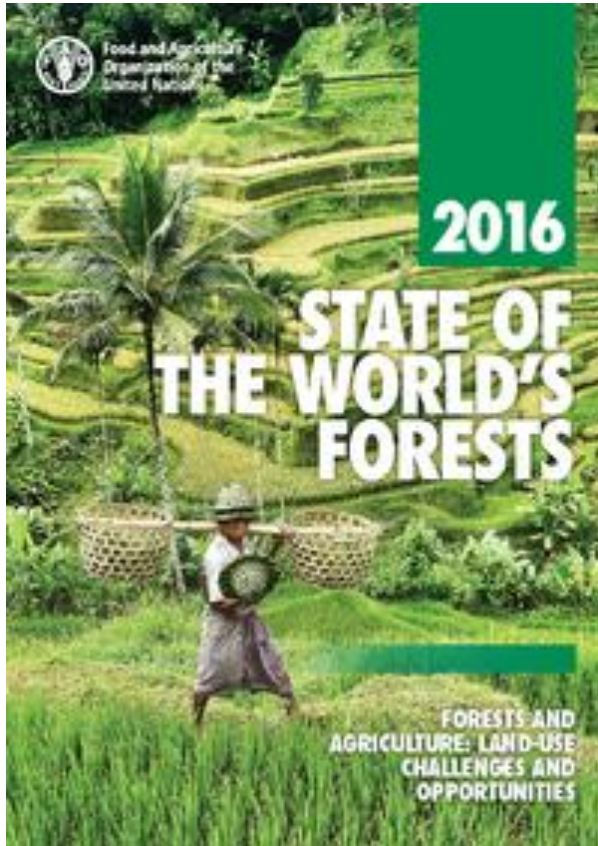
<http://www.wageningenur.nl/cbm>



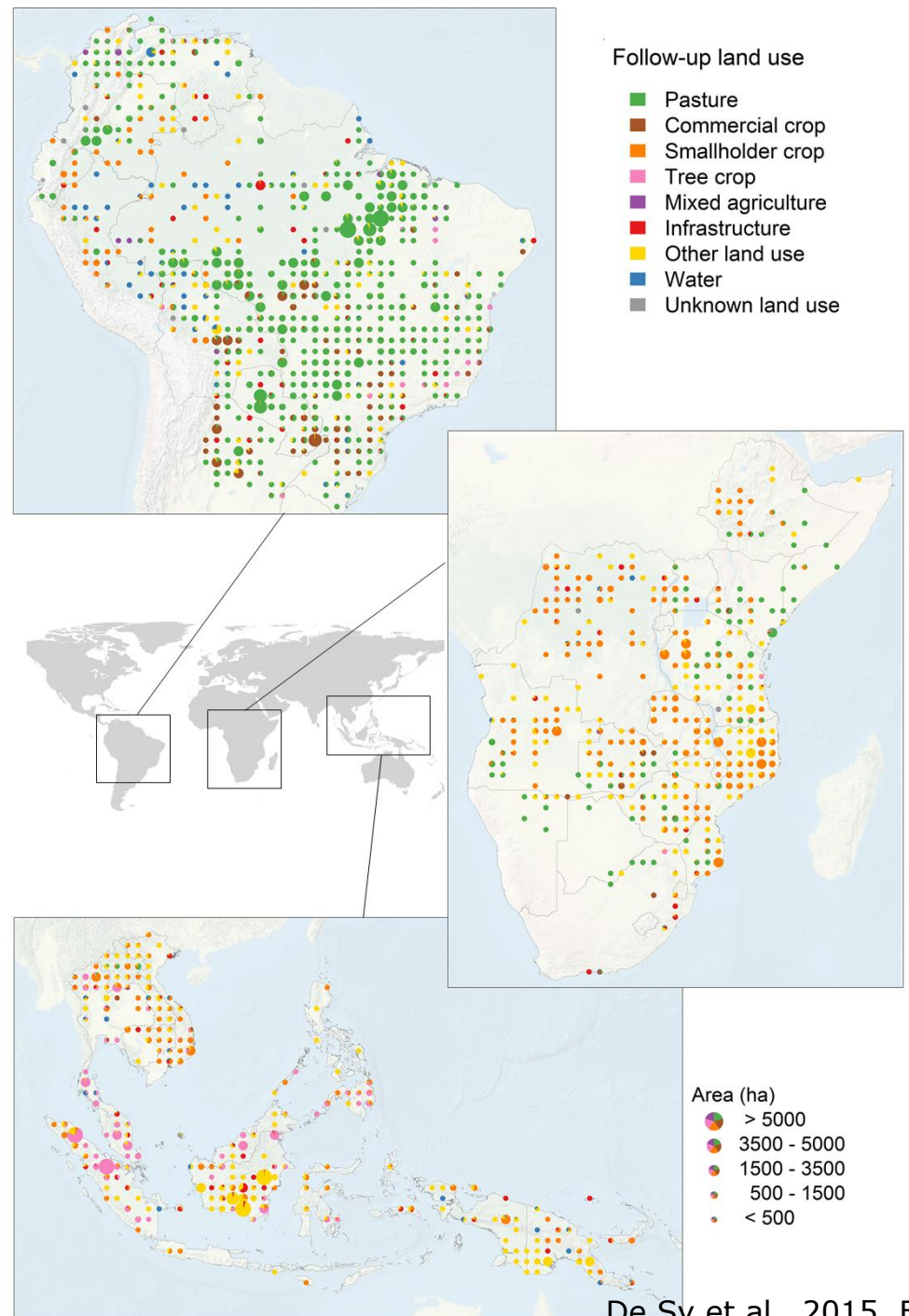
# Remarks

1. Paris agreement challenges:
  - Forest and land use sector contribution
  - Bottom up process, stocktaking and transparency
2. Global datasets can be useful for national purposes
  - Consistency checks (countries, technical assessments)
  - Use in national level estimation requirements investments in data and capacities
  - Better information and transparency for local/landscape – scale solutions and stakeholder engagement
3. Role of GFOI and GOFC-GOLD to provide guidance, research synthesis, training materials and capacity development

# Drivers of deforestation



[www.fao.org/publications/sofo/2016/](http://www.fao.org/publications/sofo/2016/)  
**Forests and agriculture: land-use challenges and opportunities**



## Enhancing transparency in the land-use sector

### Exploring the role of independent monitoring approaches

Veronique De Sy,<sup>1</sup> Martin Herold,<sup>1</sup> Christopher Martius,<sup>2</sup> Hannes Böttcher,<sup>3</sup> Steffen Fritz,<sup>4</sup> David Gaveau,<sup>2</sup> Stephen Leonard,<sup>2</sup> Erika Romijn,<sup>1</sup> Rosa Maria Roman-Cuesta<sup>1,2</sup>

#### Key messages

There is a need for independent monitoring approaches (i.e. unbiased data, tools and methods) that stakeholders involved in land-use sector mitigation activities can rely on for their own goals, but which would also be perceived as transparent and legitimate by others and support accountability of all stakeholders in the framework of the Paris Agreement.

<http://www.cifor.org/library/6256/enhancing-transparency-in-the-land-use-sector-exploring-the-role-of-independent-monitoring-approaches/>