An assessment of data quality, data sources and changes in national forest monitoring for the global forest resources assessment 2020

GFOI plenary

7. Sept. 2021

WAGENINGEN UNIVERSITY & RESEARCH

Food and Agriculture Organization of the United Nations

CIFOR

Background and objectives

Previous assessment using FAO FRA 2010 and 2015 data published (Romijn et al., 2012; 2015)

Objectives for this analysis:

1. Assess data quality of FRA 2020 in 236 countries and territories
2. Analyze the status and trend of national forest monitoring capacity and use of data sources in 236 countries and territories in the period 2005-2020
3. Investigate changes in forest monitoring capacity specifically in tropical countries

IOP Publishing Environ. Res. Lett. 16 (2021) 054029 https://doi.org/10.1088/1748-9326/abd81b

ENVIRONMENTAL RESEARCH
LETTERS

LETTER

An assessment of data sources, data quality and changes in national forest monitoring capacities in the Global Forest Resources Assessment 2005–2020

Mst Karimon Nesha[1,*], Martin Herold[1], Veronique De Sy[1], Amy E Duchelle[2], Christopher Martius[3], Anne Branthomme[4], Monica Garzuglia[4], Orjan Jonsson[4] and Anssi Pekkarinen[4]

[1] Laboratory of Geo-Information Science and Remote Sensing, Wageningen University and Research, Droevendaalsesteeg 3, 6708 PB Wageningen, The Netherlands
[2] Center for International Forestry Research, Jl. CIFOR, Situgede, Bogor 16115, Indonesia
[3] Center for International Forestry Research (CIFOR) Germany, gGmbH, Charles-de-Gaulle Strasse 5, 53113 Bonn, Germany
[4] Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, 00153 Rome, Italy
* Author to whom any correspondence should be addressed.

E-mail: karimon.nesha@wur.nl

OPEN ACCESS

RECEIVED
29 October 2020

REVISED
8 December 2020

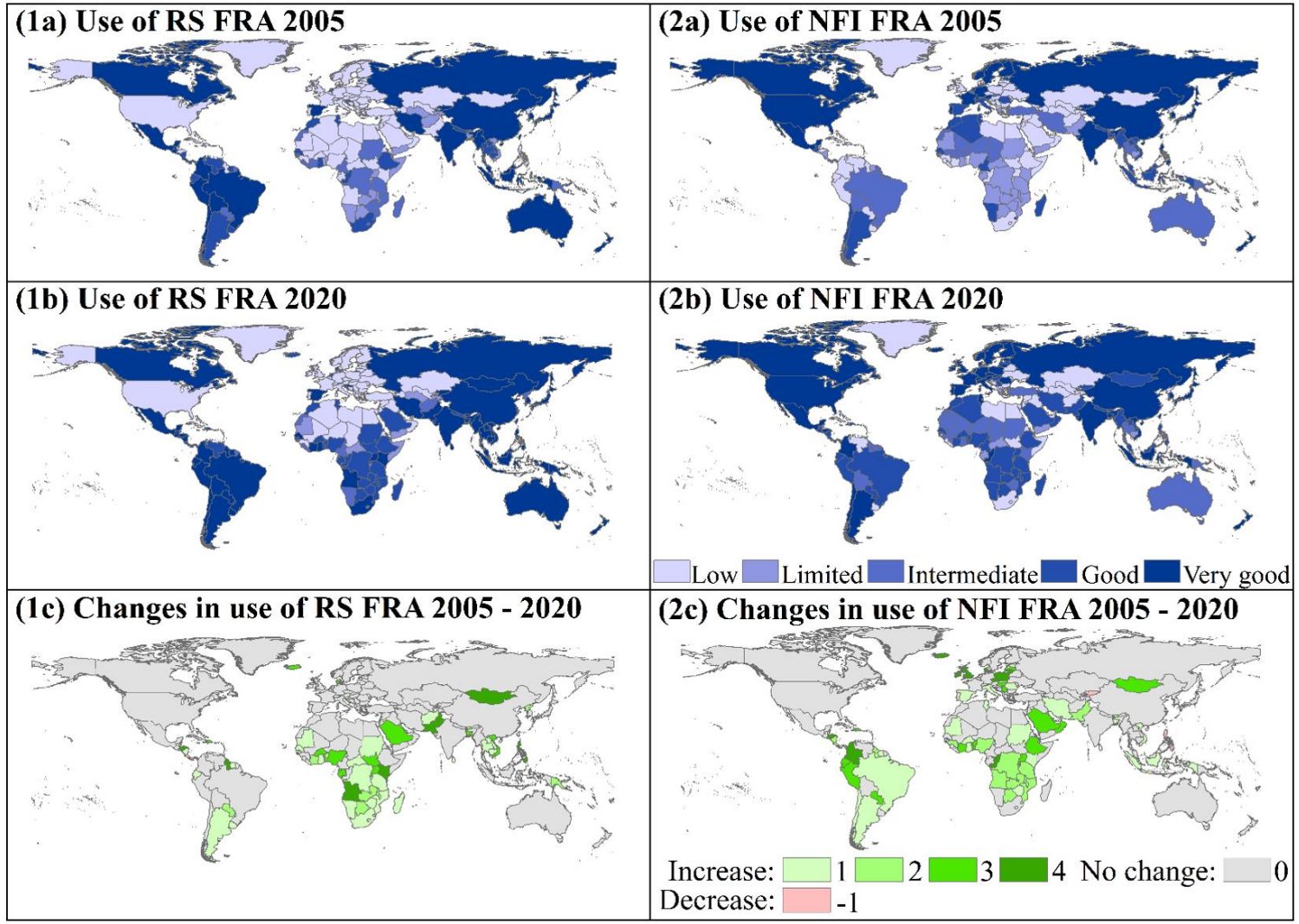
ACCEPTED FOR PUBLICATION
4 January 2021

PUBLISHED
4 May 2021

English (United

https://iopscience.iop.org/article/10.1088/1748-9326/abd81b

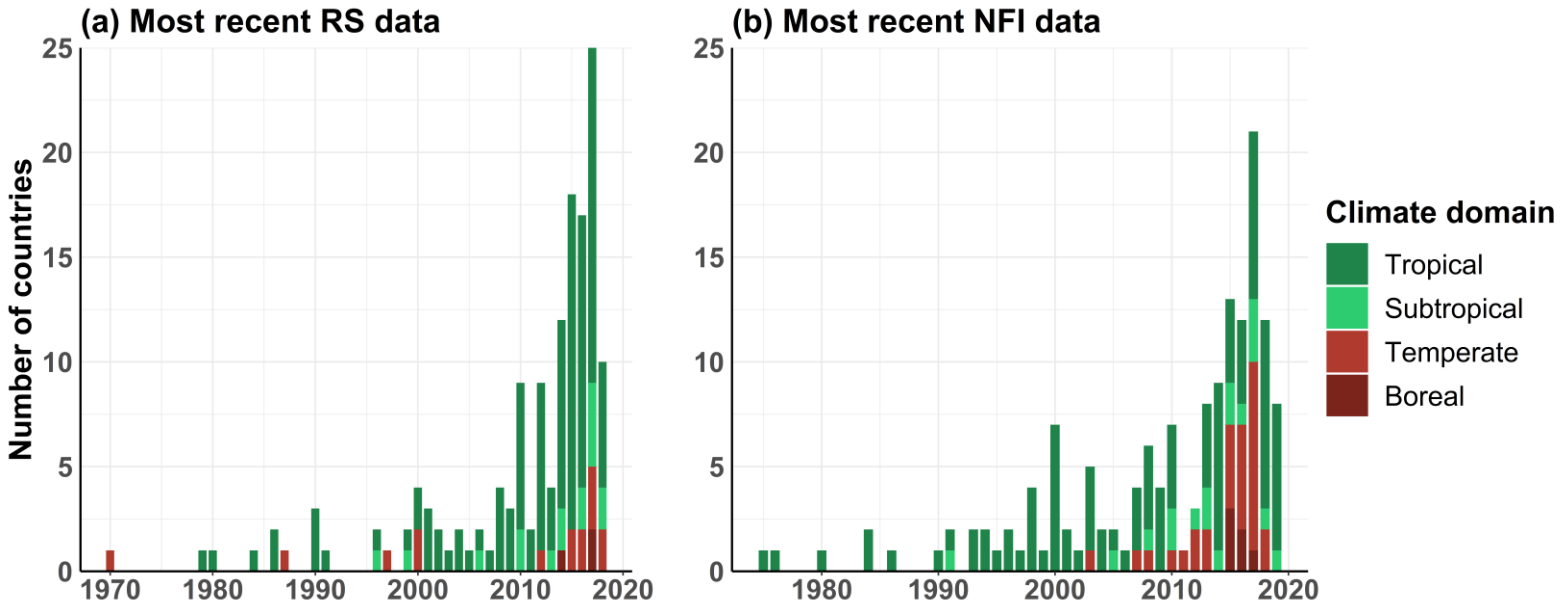
Results: Forest Monitoring Capacity Assessment



- Continuous improvement in the use of Remote Sensing data for area change estimation (in particular for Africa with room for improvements)
- NFI data improvements widespread in tropics but also Europe
- Multi-date NFI's remain rare in (sub-)tropics and parts of Asia
- Almost no decline in capacity
- North/south capacity differences turn into methodological differences

WAGENINGEN UNIVERSITY & RESEARCH

Results: Temporal distribution of the most recent RS and NFI data points



Most recent RS and NDI data in countries and territories, aggregated by climate zone; the countries and territories summed at 145 for RS and 150 for NFI data.

- Majority of countries use recent and up to date data for reporting but there is variability
- Remote sensing a bit more recent than NFIs
- Reported data have limitations for annual or biannual (large area) reporting

WAGENINGEN
UNIVERSITY & RESEARCH

Data sources for assessing country characteristics with capacity changes (tropics)

- In-depth capacity improvement analysis was conducted in the 99 (sub-)tropical countries to assess if international support contributed to national capacity improvements
- Global Forest Observations Initiative (GFOI) inventory database (http://www.fao.org/gfoi/activities) was used to investigate if international support initiatives contribute to forest monitoring capacity improvements. Among 99, 49 countries listed as supported for forest monitoring capacity building
- GFOI support activities grouped into those for forest area change/RS and for NFI

WAGENINGEN
UNIVERSITY & RESEARCH

Results: Capacity Improvements versus GFOI inventory of activities

Capacity group	Forest area change monitoring and RS capacity		NFI capacity	
	Countries with support (n=49)	Countries without support (n=50)	Countries with support (n=43)	Countries without support (n=56)
"Very good" capacity over whole period	14%	4%	5%	2%
Capacity improvements	55%	40%	51%	34%
No capacity improvements	31%	56%	44%	64%

Forest monitoring capacity improvements with and without targeted international support for RS and NFI in 99 non-annex 1 tropical countries from FRA 2010 to FRA 2020.

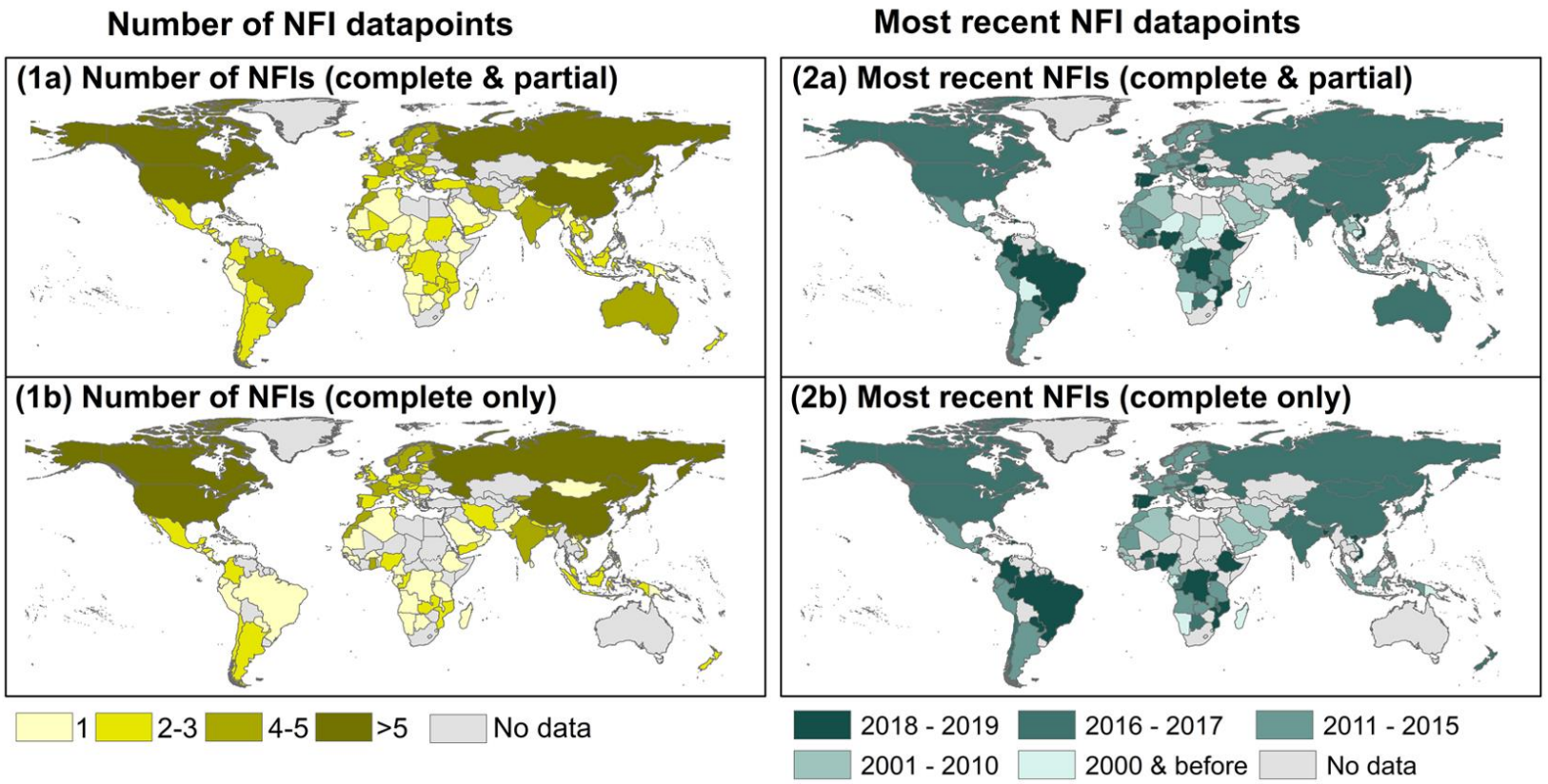
- More than 50% of countries with targeted support reported in GFOI inventory of activities improved their capacities for both using RS and NFIs
- Lower fraction, but significant share of countries improved capacities on their own or with support not reported by GFOI
- Improvement effects more pronounced for RS than for NFI (NFIs take more time)
- Still: countries with (and without) support but no visible improvement for FRA reporting

WAGENINGEN UNIVERSITY & RESEARCH

Food and Agriculture Organization of the United Nations

CIFOR

Progress and results from FAO FRA 2020 data quality analysis

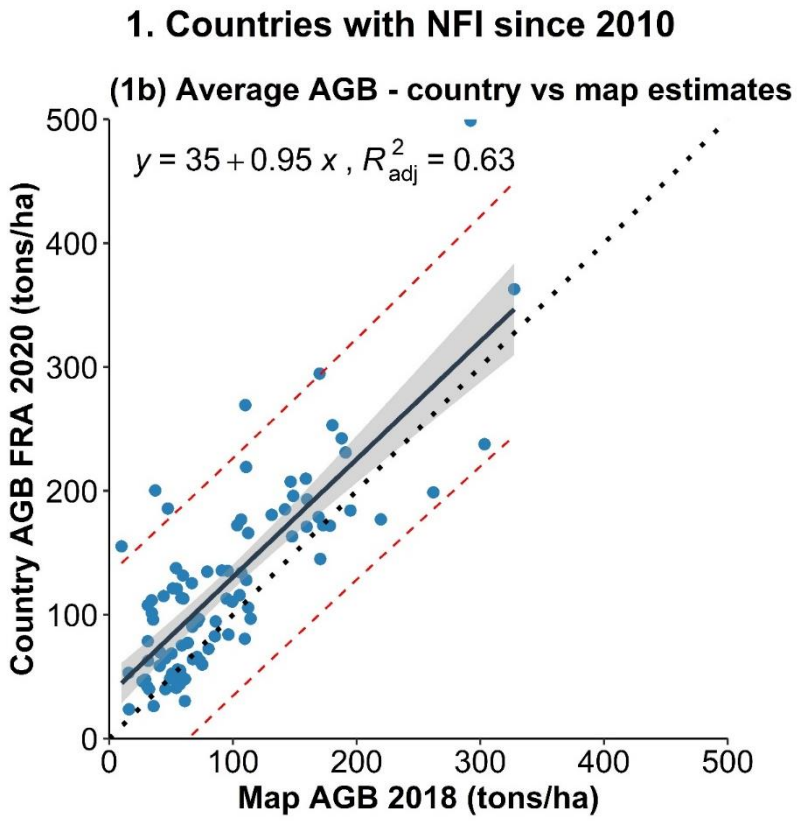


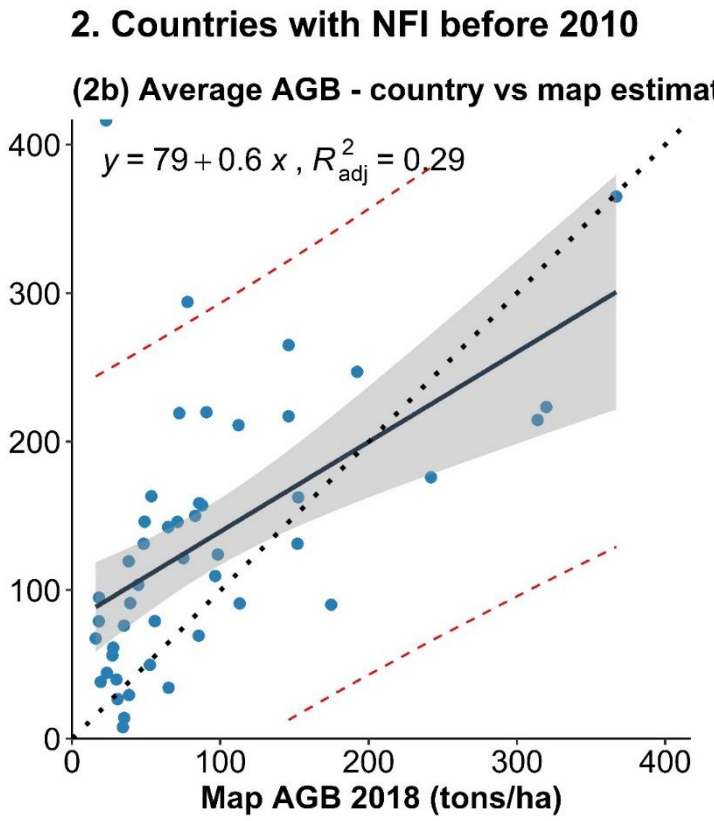
- Many tropical countries have recent/new NFI used in the reporting for FRA 2020
- Most of the them with complete coverage
- Mostly as one time effort

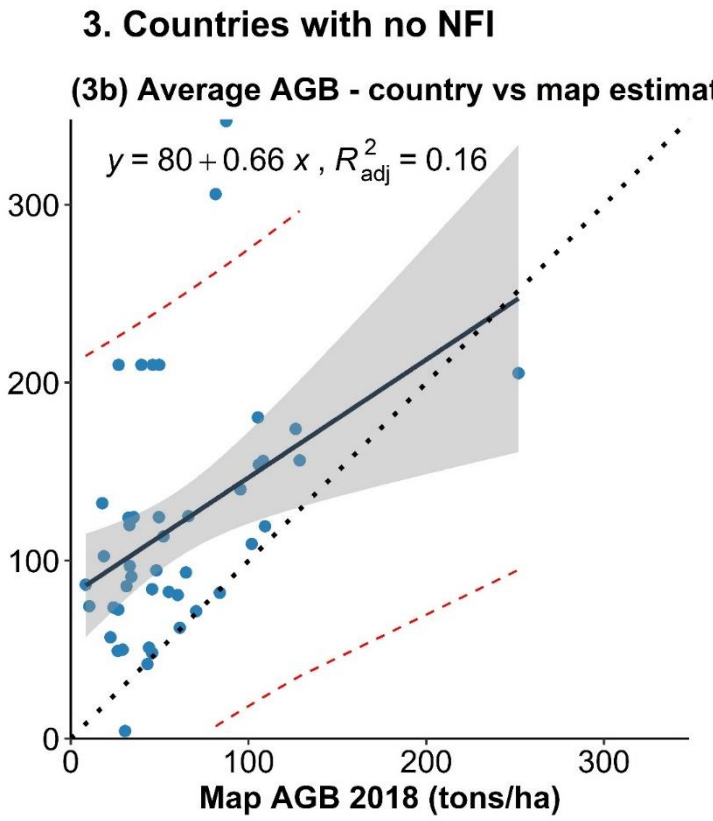
WAGENINGEN
UNIVERSITY & RESEARCH

The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Comparing average country forest biomass estimates from FRA country reports 2020 with recent global remote sensing biomass product (ESA CCI Biomass 2018)







WAGENINGEN
UNIVERSITY & RESEARCH

Concluding remarks

- Update from previous studies using 2020 data and including all countries
- Continuous improvement of data quality and country capacities 2005-2020:
  - "Catch up" of (sub-)tropical countries: capacity difference (2005) now a more of a methodological difference (2020)
  - Forest area + change: good quality, use or remote sensing is widespread in (sub-)tropics and for most large forest countries
  - More than 80% of all countries with at least one NFI; many new tropical NFIs although multi-date NFI's remain rare for(sub-) tropical countries
- Comparison with GFOI inventory shows more improvements in countries with dedicated support
- Better country data allows for improved comparison with global data sources, i.e. for integration of NFI's and space-based biomass data