

Monitoring forest degradation for REDD+: a primer

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Some useful material

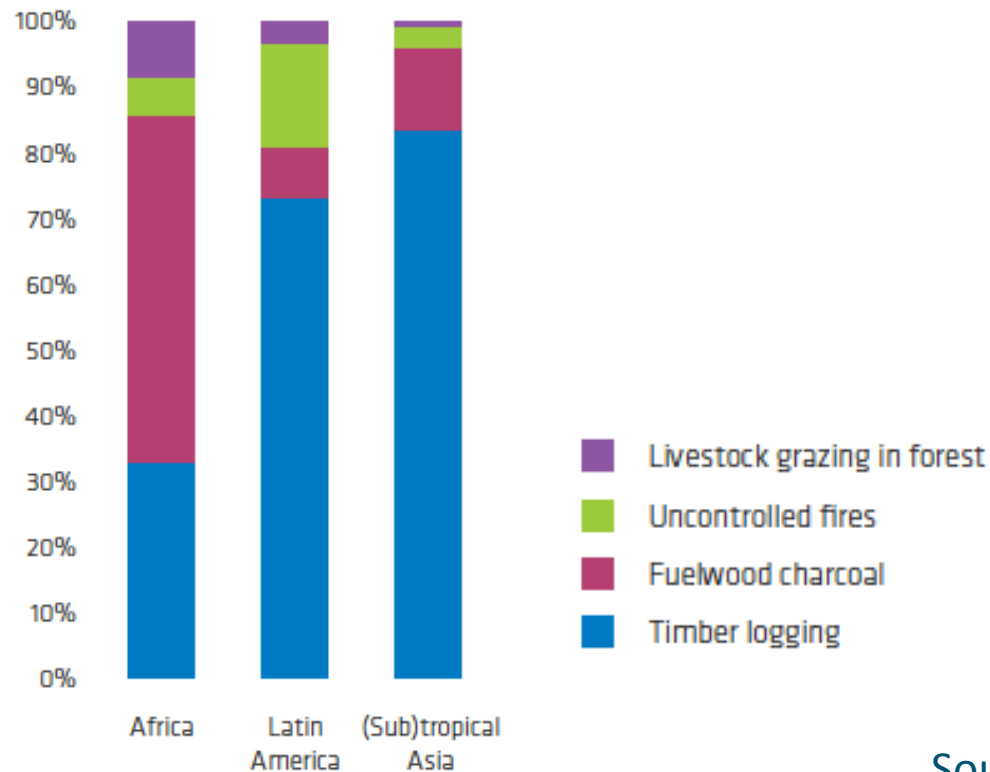
- FAO FRA/CPF special study on forest degradation 2010:
<http://www.cpfweb.org/74129/en/>
- Simula, M. 2009. Towards defining forest degradation: comparative analysis of existing definitions. Forest Resources Assessment. Pp 57. Working Paper 154. FAO, Rome.
<ftp://ftp.fao.org/docrep/fao/012/k6217e/k6217e00.pdf>
- UNASYLVA special issue on monitoring forest degradation 2011:
<http://www.fao.org/docrep/015/i2560e/i2560e00.htm>
- Herold et al., 2011. Options for monitoring and estimating historical carbon emissions from forest degradation in the context of REDD+, Carbon Balance and Management 2011, 6:13 doi:10.1186/1750-0680-6-13. <http://www.cbmjournal.com/content/6/1/13>
- GOFC-GOLD Sourcebook section 2.2
<http://www.gofcgold.wur.nl/redd/index.php>

Degradation: introduction

- Generic definition of forest degradation: *the reduction of the capacity of a forest to provide goods and services (FAO)*
- General guidance from SBSTA expert meeting (UNFCCC 2008):
 - “Degradation leads to a loss of carbon stock within forests that remain forests”
- Emission levels less than for deforestation; cumulative and secondary effects can result in significant carbon emission
- Monitoring forest degradation important to avoid displacement of emissions from reduced deforestation
- More severe degradation (area/intensity) usually result in more distinct indicators for efficient national monitoring

Important direct drivers of degradation

Proportion of forest degradation drivers



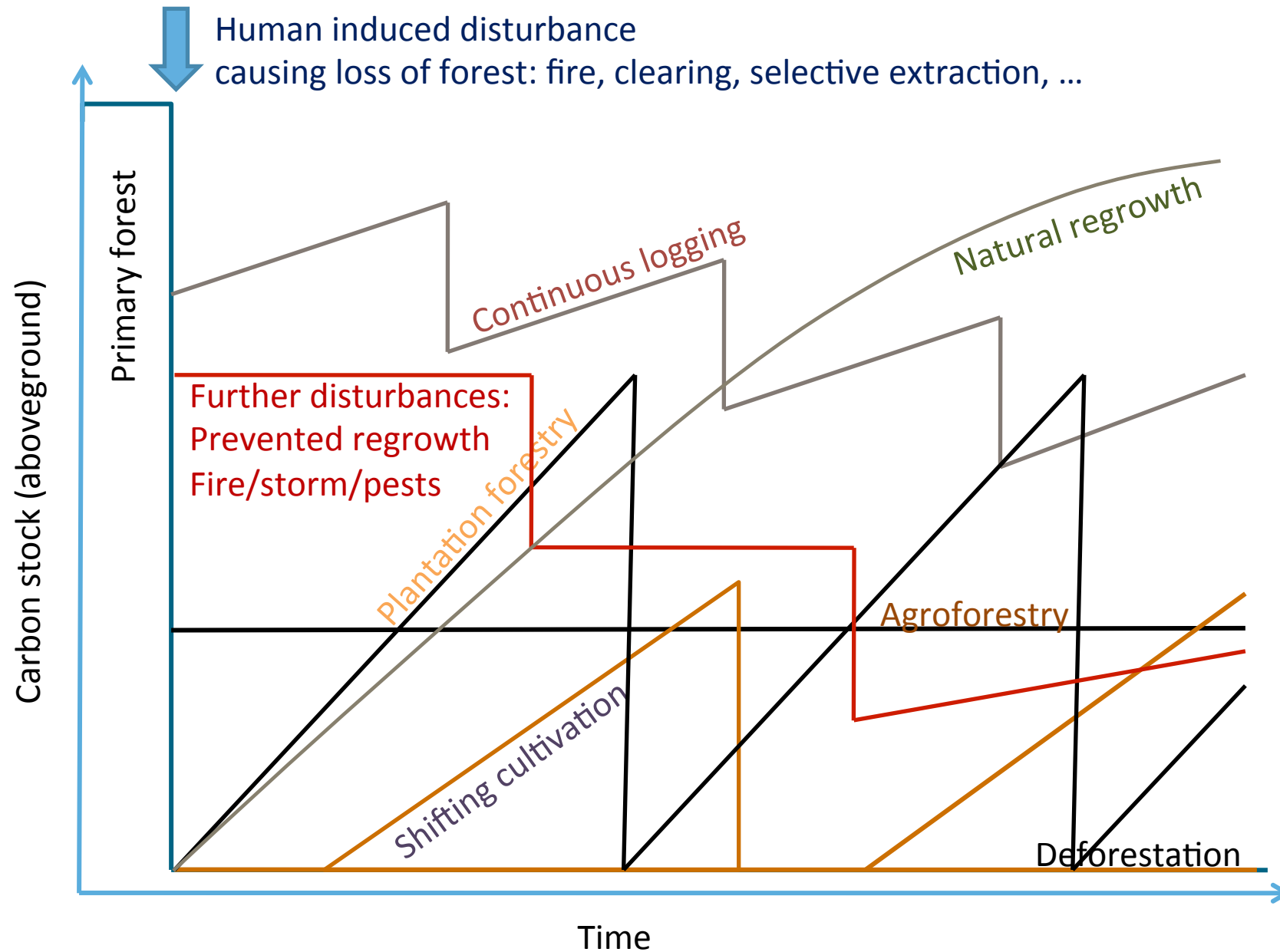
- **Latin America and (sub)tropical Asia:** Commercial timber extraction and logging > 70% of total degradation
- **Africa:** Fuel wood collection, charcoal production; followed by timber logging

Source: Hosonuma et al., 2012, ERL

Forest degradation in the context of REDD+

- Definition of forests directly affects definition of forest degradation (... within remaining forest areas)
- Several processes lead to forest degradation: logging, fuelwood collection, fire, forest grazing etc.
- From a monitoring perspective it is important to consider what type/process of degradation to be assessed:
 - Different types of degradation may require different data sources to be monitored
- Important to consider as a source but GHG impact can hardly be separated from forest regrowth (and the “plus” part)
 - Assessing the impact of REDD+ interventions

Forest degradation & carbon stocks impacts



Common sources for activity data for forest degradation

1. Field observations and surveys:

- Inventory based approaches (national, sub-national)
- Data from targeted field surveys (incl. interviews), research and permanent sample plots
- Commercial forestry data (i.e. logging concessions and harvest estimates)
- Proxy data for domestic markets and demands (charcoal, fuelwood, subsistence)
- Community/local expert monitoring (of activities)

2. Remote sensing :

- Direct detection of degradation processes (forest canopy damage)
- Indirect approaches (observe human infrastructure)
- Fire monitoring (active fire and burned area)

Options for monitoring historical forest degradation

Activity/driver of degradation	Activity data (on national level)
Extraction of forest products for subsistence and local markets, such as fuelwood and charcoal	<ul style="list-style-type: none">• Limited historical data• Information from local scale studies or using proxies (i.e. population density etc.)• Only long-term cumulative changes may be observed from historical satellite data
Industrial/commercial extraction of forest products such as selective logging	<ul style="list-style-type: none">• Harvest data and statistics• Historical satellite data (Landsat time series) analysed with concession areas• Direct approach should be explored for recent years
Other disturbances such as (uncontrolled) wildfires	<ul style="list-style-type: none">• Historical satellite-based fire data records (since 2000) to be analysed with Landsat-type data

Source: Herold et al., 2011

Estimation emission reductions from fuel efficient cook stoves

- A total of 11,156 stoves were distributed as part of a project (Ethiopia)
- Impact of MIRT stoves on fuelwood-driven carbon emissions were estimated through household interviews and by measuring the daily fuelwood consumption in households with and without MIRT stoves

	Average Daily Fuelwood consumption per household(kg/day)	Annual CO ₂ emissions (tCO ₂ /hh/y)	Annual CO ₂ (tCO ₂ /y)
Traditional cookstoves	31.4	15.06	168,692
MIRT cookstoves	23.2	11.13	124,705
Difference	8.2	3.93	43,987

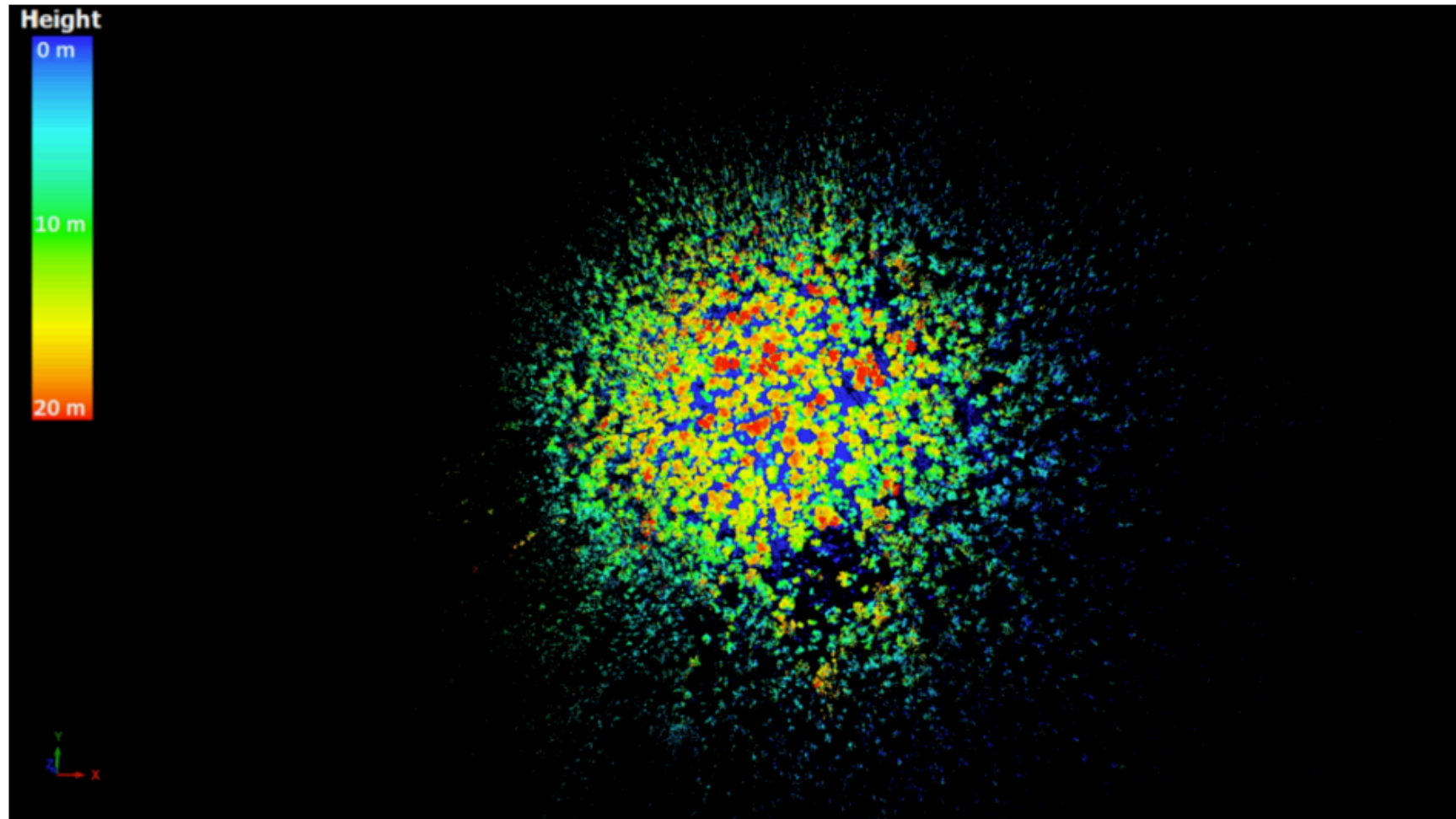
MIRT cooking stove emission reductions:
3.93 tonnes CO₂ per cookstove distributed per year

Source: Dresen et al., 2014, LAND
<http://www.mdpi.com/2073-445X/3/3/1137>

Some key issues for monitoring

- Use of remote sensing most useful for selective logging, fire and shifting cultivation
 - Approaches, examples, experiences?
 - Issue for remote sensing science

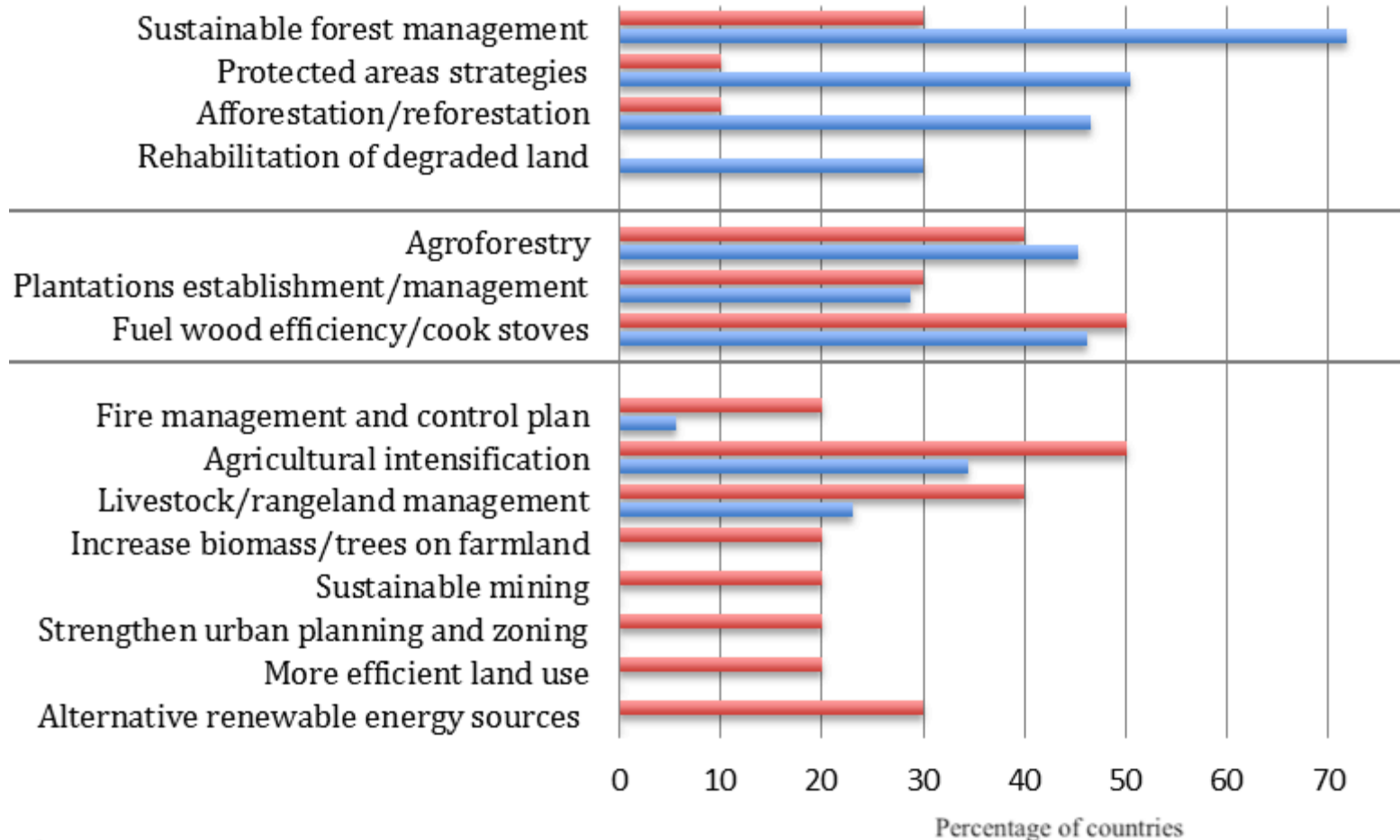
How terrestrial LIDAR works in forests



Some key issues for monitoring

- Use of remote sensing most useful for selective logging, fire and shifting cultivation
 - Approaches, examples, experiences?
 - Issue for remote sensing science
- Integration of remote sensing and other data sources for estimation:
 - Uncertainties in deriving emissions
 - Avoid double counting when using multiple approaches
- Focus on assessing impacts of key interventions

Some key issues for monitoring



■ Countries with driver specific interventions ■ All other countries

Based on assessment of 43 REDD+ countries in 98 readiness documents

