International Symposium on Southeast Asian Tropical Rain Forest Research related with Climate Change and Biodiversity

# Managing Tropical Forests for Timber, Carbon, and Biodiversity Conservation

**Nophea Sasaki**
University of Hyogo
**(兵庫県立大学大学院)**
nopsasaki@gmail.com

# REDD+ and Timber


Illegal rosewood


rosewood tree

- **REDD**: Reducing Emissions from D & D
- "**REDD+"** additionally includes
  - Conservation of Carbon Stocks
  - **Sustainable Management of Forests**
  - Enhancement of Forest Carbon Stocks
- Safeguard Biodiversity and Local Benefits
- **REDD+**: Compensation scheme for reducing carbon emissions
- **Timber demand will continue. Maintaining this demand is therefore important for the success of REDD+ scheme**

# Questions

- How can we achieve timber supply while still preserving carbon stocks?
- Are there any convincing stories about good logging practices that could be adopted?
  - Conventional Logging (**CVL**): unplanned, unsupervised
  - Reduced Impact Logging (**RIL**): Planning, training, supervising
  - How can we safeguard biodiversity and local benefits?

# Reducing logging damages and wastes

| Variables | Locations | CVL | RIL | Sources |
|---|---|---|---|---|
| **1. Logging damages** to residual stands as percentage of commercial stem density | Sarawak, Malaysia | 54.0% | 28.0% | FAO (2001) (DBH ≥10 cm) |
| | Sabah, Malaysia | 60.0% | 30.0% | Tay et al. (2002) (DBH ≥1 cm) |
| | East Kalimantan, Indonesia | 48.4% | 30.5% | Bertault & Sist (1997) (DBH ≥10 cm) |
| | East Kalimantan | 24.7% | 14.5% | Sist et al. (2003) (DBH>20 cm) |
| **2. Logging wastes** as percentage of harvested wood | Sarawak, Malaysia | 20.0% | 0.0% | FAO (2001) |
| | East Kalimantan, Indonesia | 46.2% | 26.2% | Sist & Saridan (1999) |
| | Easter Amazon | 24.0% | 8.0% | Holmes et al. (2002) |
| **2. Increase Wood Processing** | | 33-55% | 60%? | |

Adopted from Sasaki & Putz (2009)

Switch to

# From: Production Forests, to Logging; to Wood Products; to Housing


## Illustration

**Area**: **403 M ha** (ITTO)
**Aboveground** C/ha:
**172.5 (±16.8)**
(based on Putz et al. 2012, Kim-Phat et al. 2002, Okuda et al. 2004, more)
**Operable Area**:
**50-100%**

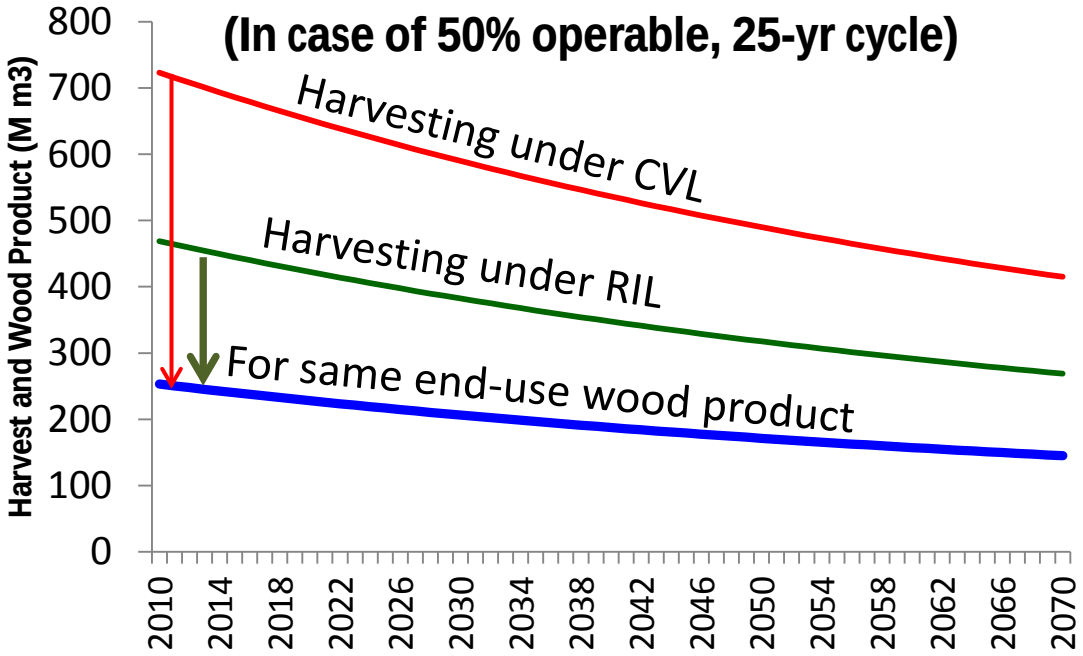



**We secure this**

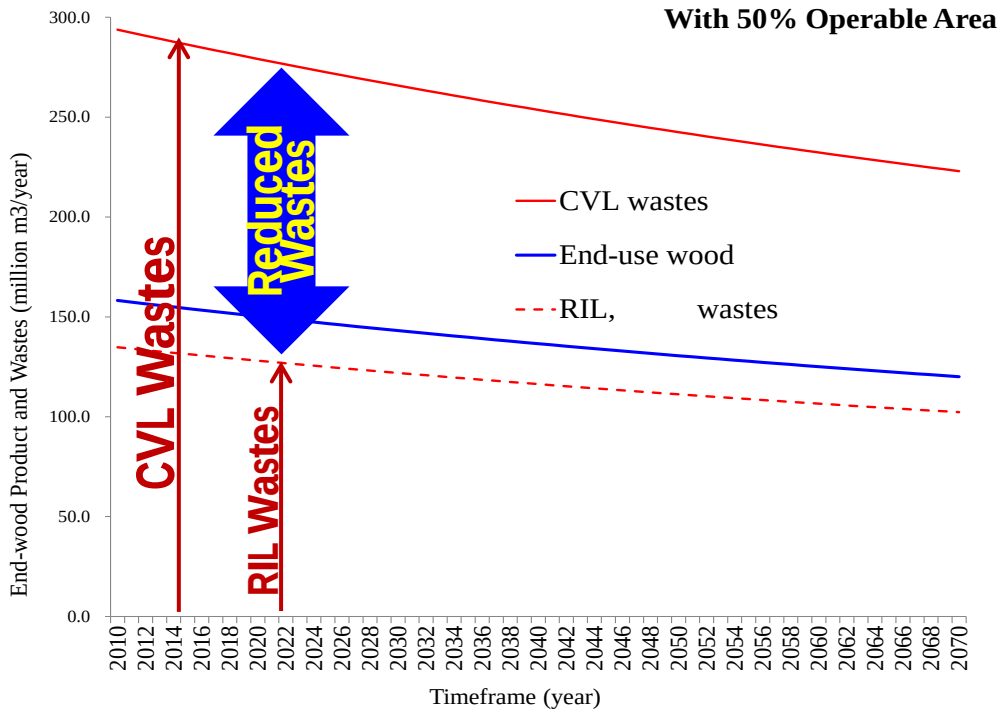
**We reduce this**




See Methods in Sasaki et al. (2012) *Environmental Science & Policy*

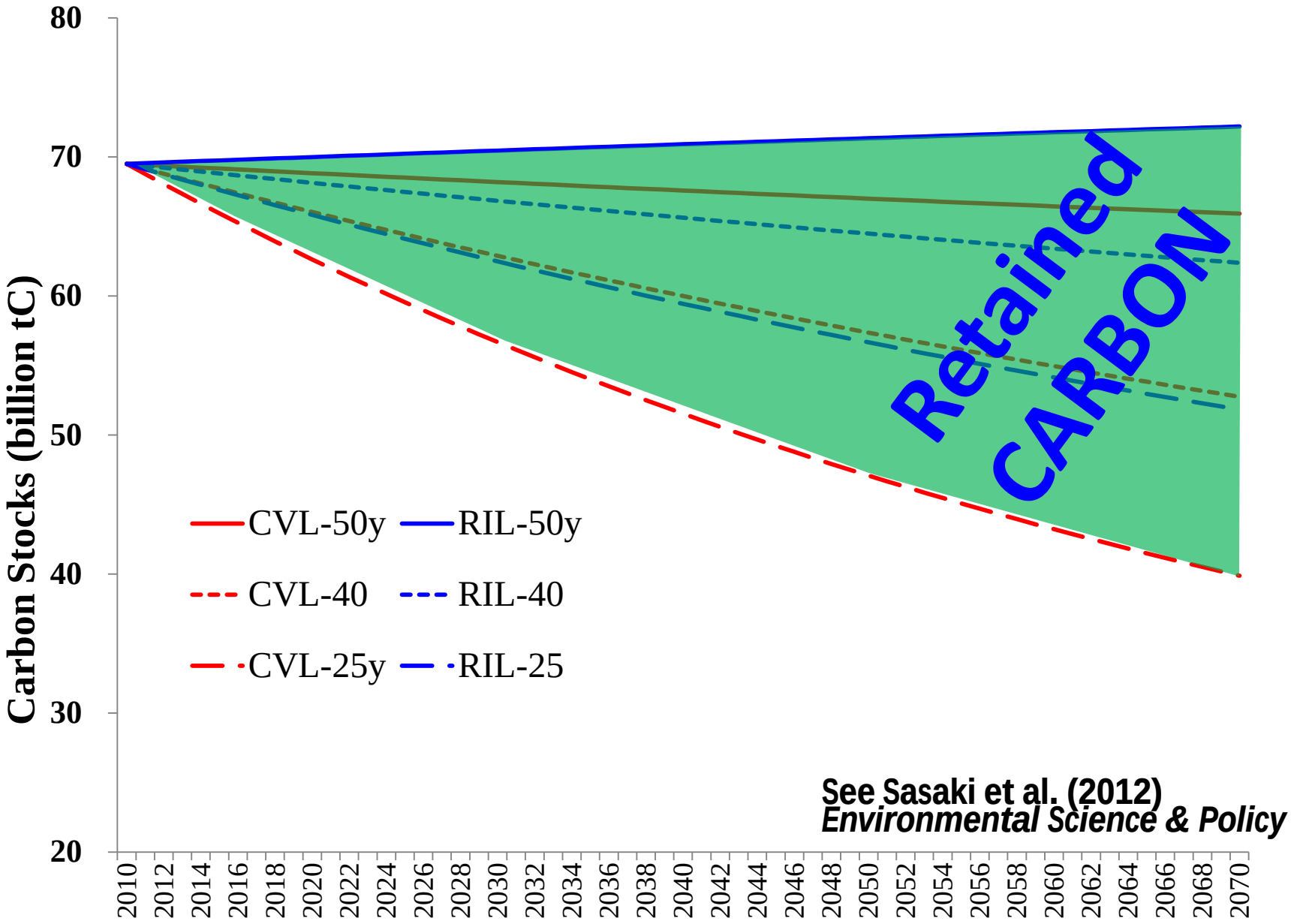



**RIL harvests LESS for same product, reduces damages, retain more carbon**




**RIL also reduces wastes (short-life carbon) for same product**

# RIL could retain more carbon



# RIL vs CVL Revenues (403 million ha)

| Revenues and Policy Options (50-year cycle with 50% operable area) | Cutting Cycle | | |
|---|---|---|---|
| | 25-year | 40-year | 50-year |
| EWP (million m3/year) | 199.7 | 140.4 | 82.4 |
| Unit price* ($/m3) | 800.0 | 1040.0 | 1040.0 |
| **Timber Revenues ($ billion/year)** | **159.7** | **146.0** | **85.7** |
| Future Loss ($billion/year) | **-1.2** | **-0.7** | **-0.1** |
| Carbon credits (billion tCO2) | 1.0 | -0.7 | -1.0 |
| Carbon Price ($/tCO2) | 8.0 | 8.0 | 8.0 |
| Carbon Revenues ($ billion/year) | | 5.9 | 8.4 |
| ***Total Revenues ($ billion/year)*** | ***158.5*** | ***151.2*** | ***94.0*** |
| **Policy options** | | | |
| 1. Penalty for carbon emissions ($ billion/year) | -7.7 | 5.9 | 8.4 |
| ***Total Revenues ($ billion/year)*** | **150.8** | **151.2** | **94.0** |
| 2. Payment for ecosystem services, PES ($/ha/year), 10% of Costanza et al. (1997) | 0.00 | 146.9 | 146.9 |
| PES for 403 million ha ($ billion/year) | 0.0 | 59.2 | 59.2 |
| ***Total Revenues ($ billion/year)*** | **150.8** | **210.4** | **153.2** |
| **COSTS: RIL is profitable (Holmes et al. 2002), other studies vary (Medjibe & Putz 2012)** | | | |

# Biodiversity => Unplanned Tree Felling:

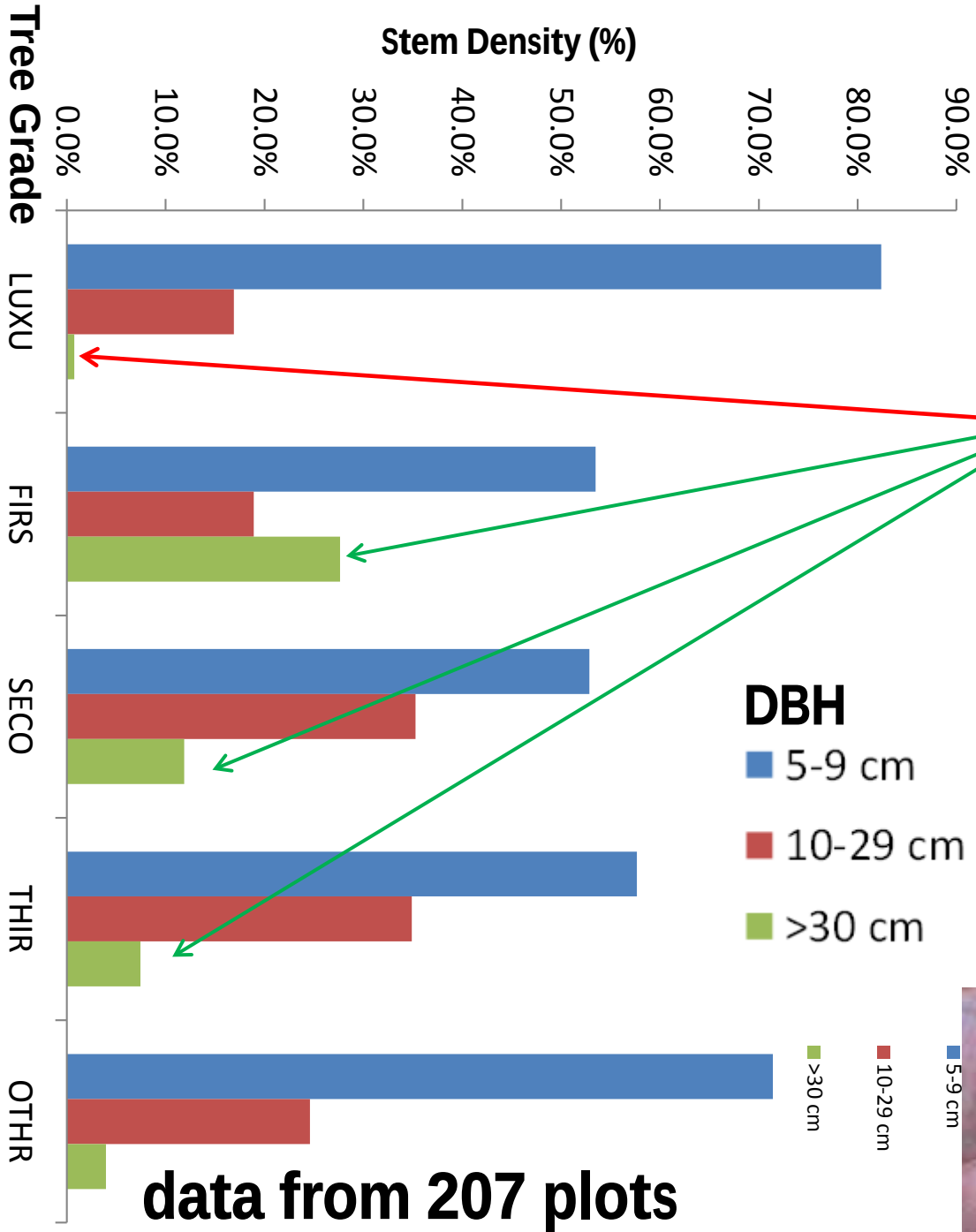
## Expensive Trees are likely to be cut (all DBH>30 cm)

| Species Code & Grade | Botanical Name | Density (trees/ha) | Volume (m3/ha) | Grades | Price (US$/m3) | IUCN-List |
|---|---|---|---|---|---|---|
| **Luxury Grade** | | **0.5** | **2.7** | LUXURY | 3,400-11,000 | Critically Endangered |
| CHKM | *Dispyros spp.* | | | | | |
| **Grade I** | | **18.7** | **45.9** | | | |
| KRKO | *Sindora conchinchinnensis* | 2.7 | | I | 500-600 | Threatened Species |
| DCSP | *Tarrietia javanica* | 1.4 | | I | 500-600 | Endangered Species |
| SRLO | *Lagerstroemia sp.* | 0.6 | | I | 500-600 | |
| KRLA | *Dialium sp.* | 0.6 | | I | 500-600 | |
| Others | | 13.5 | | | | |
| **Grade II** | | **20.7** | **85.1** | II | | |
| CHBG | *Dipterocarpus costatus* | 7.5 | | II | 430-460 | Threatened Species |
| CRMS | *Vatica astrotricha* | 3.9 | | II | 430-460 | |
| PHDK | *Anisoptera glabra* | 6.6 | | II | 430-460 | Threatened Species |
| SRKM | *Payena elliptica* | 1.3 | | II | 430-460 | |
| Others | | 1.3 | | II | 430-460 | |
| **Grade III** | | **19.8** | **2.1** | III | 130-150 | |
| PHON | *Callophyllum sp.* | 1.2 | | III | 130-150 | |
| PRNG | *Eugenia spp.* | 5.9 | | III | 130-150 | |
| TLOK | *Parinarium annamensis* | 2.9 | | III | 130-150 | |
| TRTM | *Crypteronia sp.* | 1.6 | | III | 130-150 | |
| Others | | 8.3 | | | | |
| **UNKNOWN** | | **18.6** | **34.5** | unkn | 100.0 | |
| TOTAL | | 78.4 | 170.3 | | | |
| **HARVESTING (30% cut)** | | | **51.1** | | | |

**Any tree may be cut depending on who supervises logging**

Data from **207 plots** in Sandan, Cambodia

**Note**: This calculation is based on the assumption that trees with DBH> 30 cm can be harvested. In practice, such DBH limits from one species to another




# Expensive tree became less as unplanned logging goes on

Despite having high proportion of small trees, mature trees in **Luxury Grade** were almost gone:

**loss of expensive mature trees**

**data from 207 plots**

# RIL can additional ensure

- Socially and environmentally **sensitive areas** (*forests on steep slopes, bufferzones around waterways and villages, and socially, culturally, environmentally important sites*) are strictly prohibited from logging
- These sensitive areas are vital for safeguarding biodiversity and local benefits


# Most Recent Studies about RIL

- **Imai *et al*.** (2009): More wildlife and carbon stocks in RIL-used forests
- **Miller *et al*.** (2011): RIL resulted in small decreases in gross primary production, leaf production, and latent heat flux
- **Putz *et al*.** (2012): RIL can sustain timber production, retain species, and conserve carbon stocks
- **Pena-Claros** *et al*. (2008), **Villegas** *et al*. (2009): RIL could accelerate growth
- Costs: **Lower under RIL** but see **Medjibe & Putz** (2012) for comprehensive reviews of the Costs

# Way forwards …

- **Adopt RIL, develop its guidelines, and Training**
- **Safeguards**: Develop guidelines for managing sensitive areas for biodiversity and local benefits
- **Transparent enforcing mechanism**
- **Double measures:**
  - Validated and verified timber-carbon projects
  - Certified timber production and market access
- **More research on RIL Impacts on Biodiversity and Environment, and RIL Costs**

# THANK YOU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