

REDD+ & AGRICULTURAL DRIVERS OF DEFORESTATION

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ASB Partnership at ICRAF

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World Agroforestry Centre
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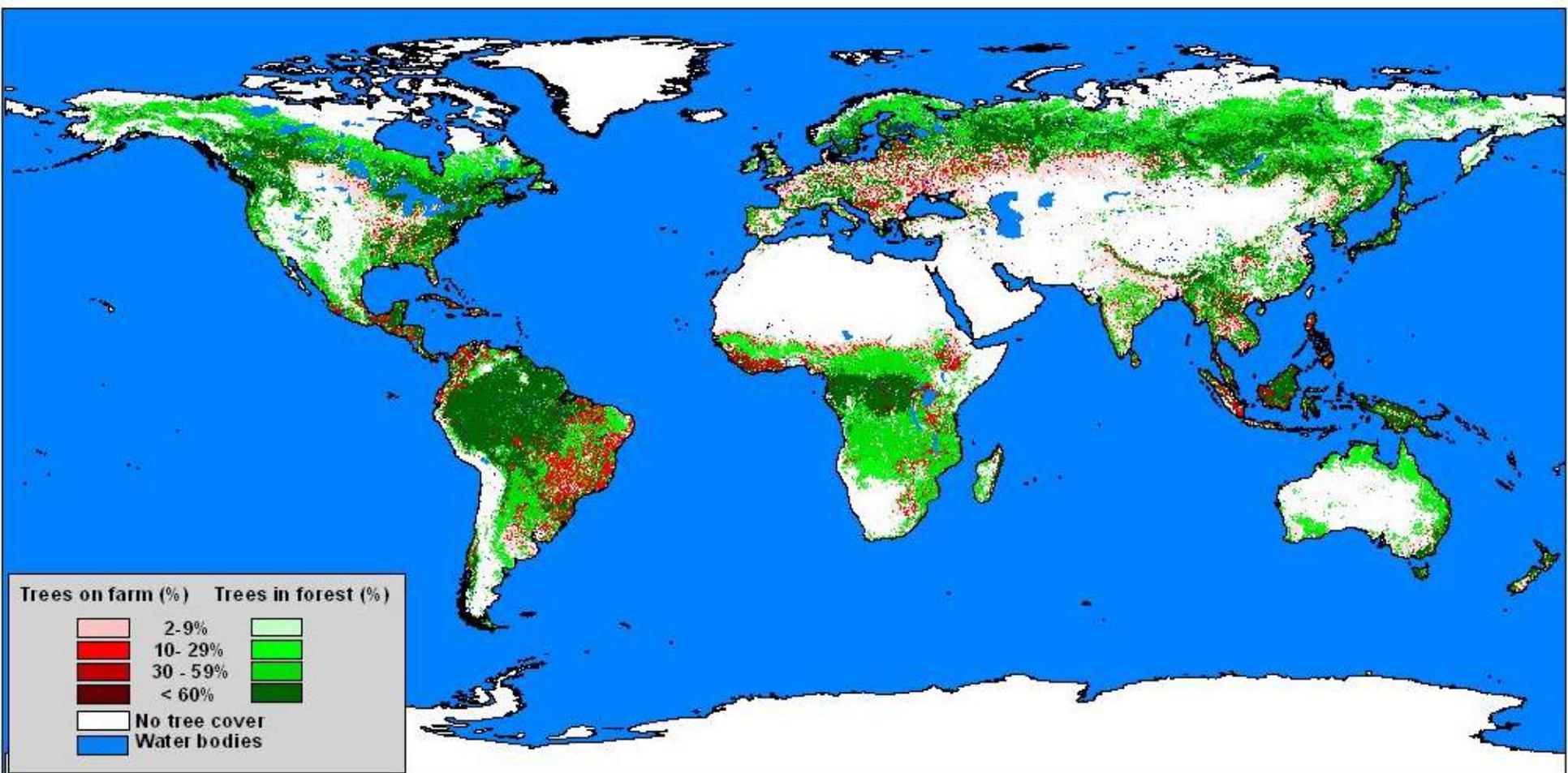


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The structure

- What does deforestation mean?
- Agricultural drivers of deforestation
- The Intensification (Borlaug) hypothesis
- The multi-functionality hypothesis
- From “Sparing” to “Sharing”
- Some reflections

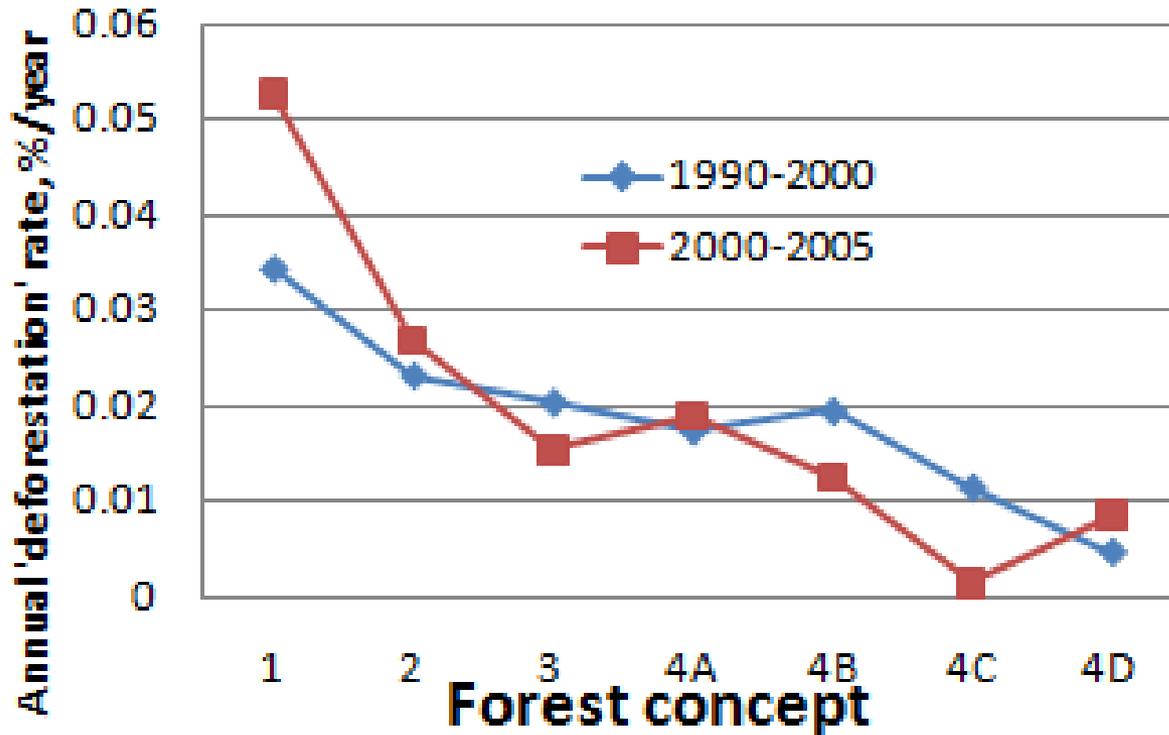




The holistic forest+tree view of the world

Source: Global tree cover inside and outside forest, according to the Global Land Cover 2000 dataset, the FAO spatial data on farms versus forest, and the analysis by Zomer et al. (2009)

Indonesia's deforestation rate ~ forest definition



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Stakeholder:

Rainforest foundation ←

1. Undisturbed natural forest

Conservation agency ←

2. Undisturbed + sust. logged natural forest

Forest ecologist ←

4A. as 3 + agroforest

Ministry of Forestry ←

4B. as 3 + timber plantations

UNFCCC definition ←

4C. as 3 + agroforest + timber plant's + estate crops

Modis data ←

4D. as 4C + shrub

Agriculture as driver of REDD



- Increased demand for food, fiber and fuel for rising population
- = clearing of forested lands
- 80% of farm establishments in 1980s & 90s in developing countries came from intact forests
- With 3-4x more GHG emissions than temperate areas



Drivers of Deforestation in UCAYALI- Peru: Macro-economic/ agric policies, roads and timber

1945 - 1970

- Government development policy for Amazon,
- Road expansion Lima to Pucallpa (Belaunde + Verlazco Gov't in 60 and 70s)

1970s

- Timber industry,
- Immigration,
- Population Growth

1980s

- Coca boom,
- Agricultural growth due to price subsidies (Garcia Gov't)

1990s

- Terrorism,
- Coca boom
- Removal of all subsidies

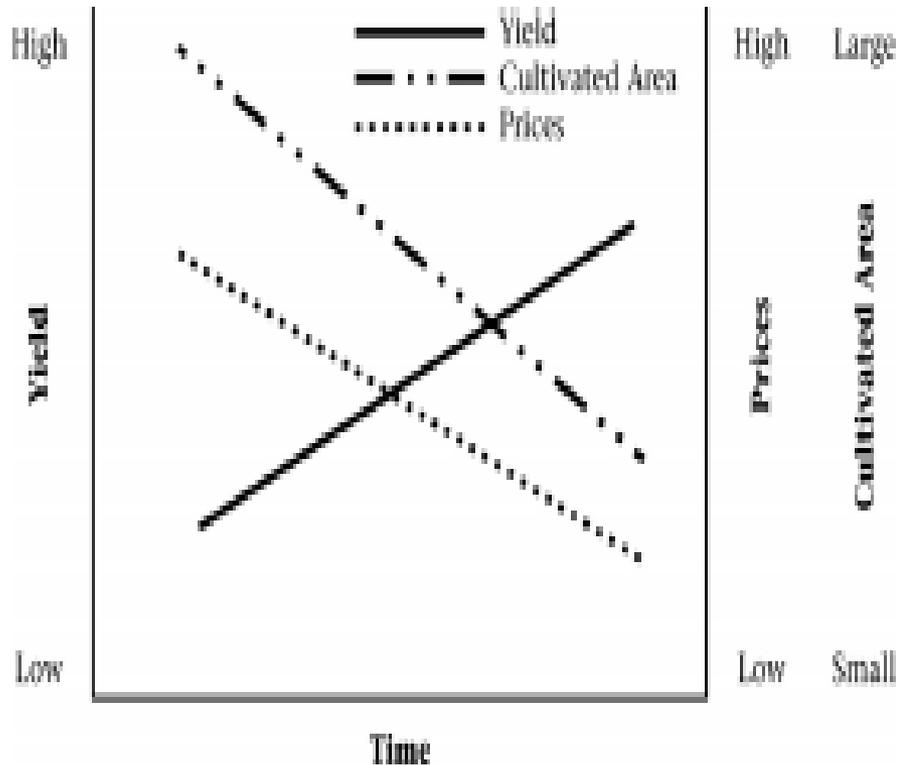
2000s

- Immigration,
- Population Growth



How is government investing in alternate energy – how does it affect forests?

Can Intensification spare forests for REDD? Borlaug Hypothesis!!!!

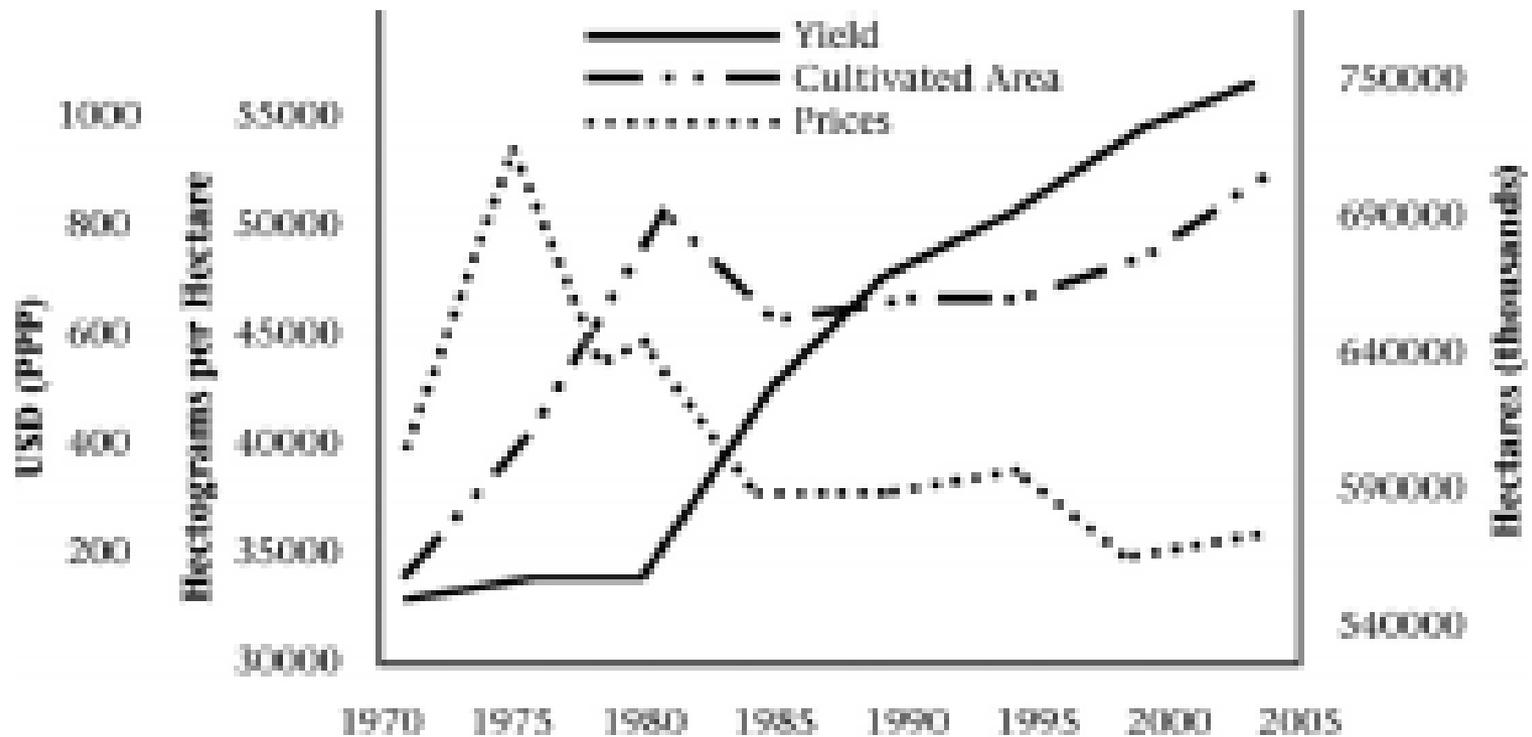


Rudel et al., 2009

- Higher Yield = more food on same land area
- Therefore sparing more land for forest conservation
- Therefore potentially resolve Agriculture – REDD conflict?????



How true is Borlaug? - Global



Rudel et al., 2010



How true is Borlaug? -Global II

- Only between 1980 – 85 (sustained decline in prices & increased yield in 70s) we see evidence of intensification leading to reduced yields
- Two pathways:
 - i. Increased Yields + Inelastic demand = lower prices = POSSIBLE DROP IN AREAS
 - ii. Increased yields + elastic demand = INCREASE IN AREAS CULTIVATED
- (Rudel et al., 2009)



How true is Borlaug- III?

- Agric production in Developing countries increased by 3.3 - 3.4 / yr in last 20 yrs; Bu t deforestation increased agric area by only 0.3% / yr (Angelsen, 2010)
- BUT Regional specificities worth noting
- In Africa, 70% of increased output in food production is derived from expansion of harvested area, while globally, only 22% is due to expansion of harvested areas (Chomitz, 2006).



Change in cereal production due to change in area and yield

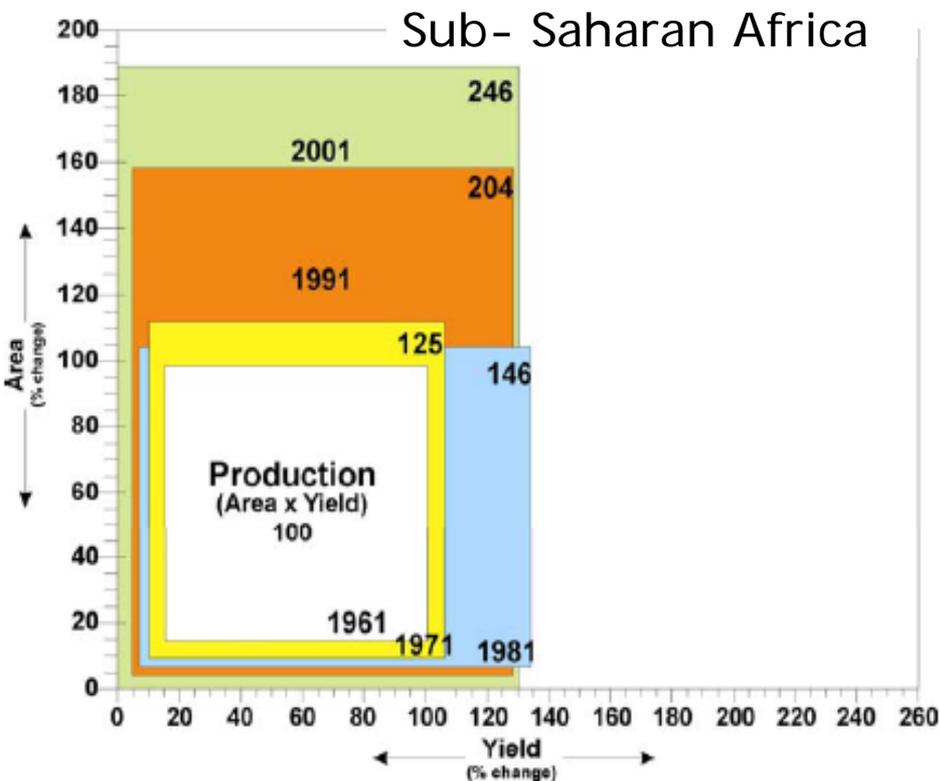


Figure 1. Changes in Cereal Production in Sub-Saharan Africa Due to Changes in Area and Yield (1961 = 100)

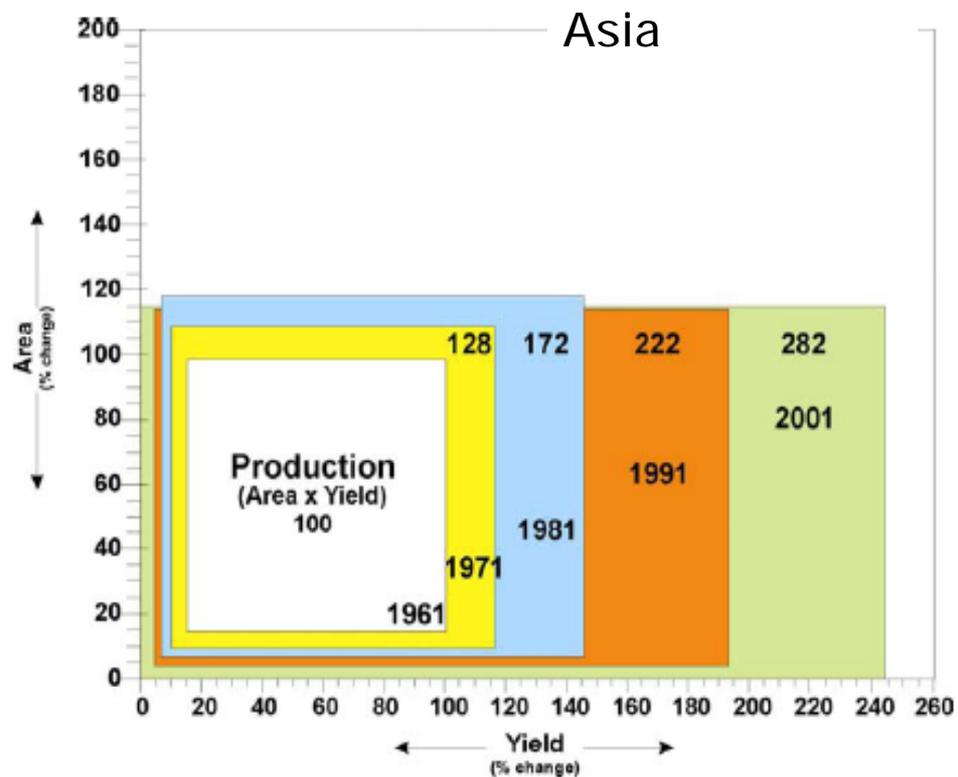


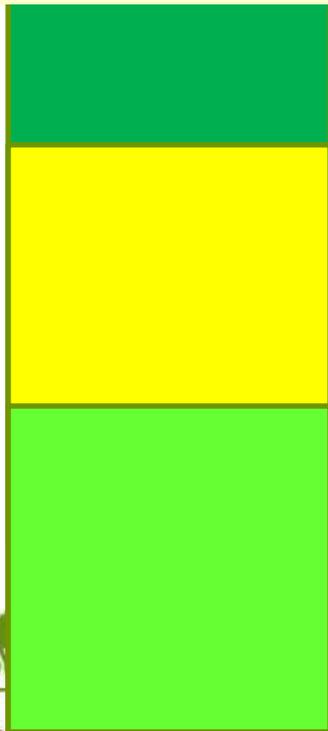
Figure 2. Change in Cereal Production in Asia Due to Changes in Area and Yield (1961 = 100)

Agricultural intensification hypothesis

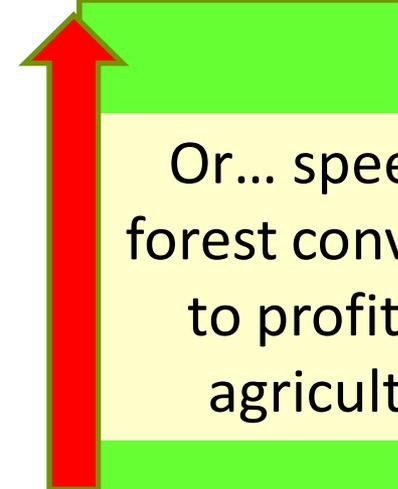
Remote forest edge communities & Planet earth are closed

systems, in between we have 'open' systems...

More intensive agriculture at forest margins can save forest at equal total agricultural production



This may be true in 'closed' economies



Or... speed up forest conversion to profitable agriculture

This is true in 'open' economies

Therefore

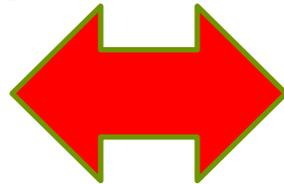
- Intensification of agriculture is a necessary but not sufficient condition for forest protection

(ASB-Indonesia, 1995; ASB- Brazil, 2001)



Sparing vs Sharing Segregate vs Integrate

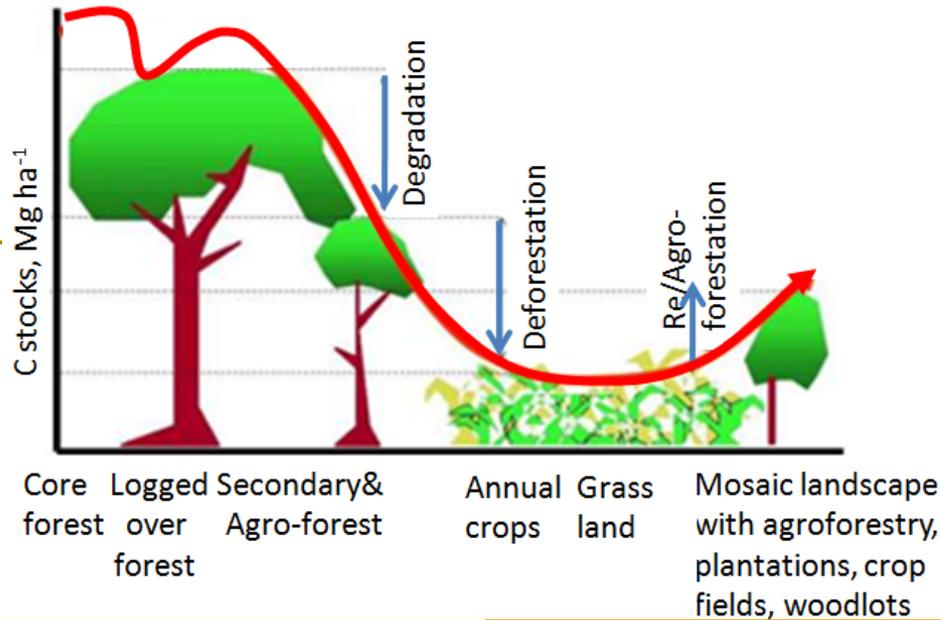
- Sparing/segregate
intensification hypothesis



- Sharing/integrate
multifunctionality hypothesis

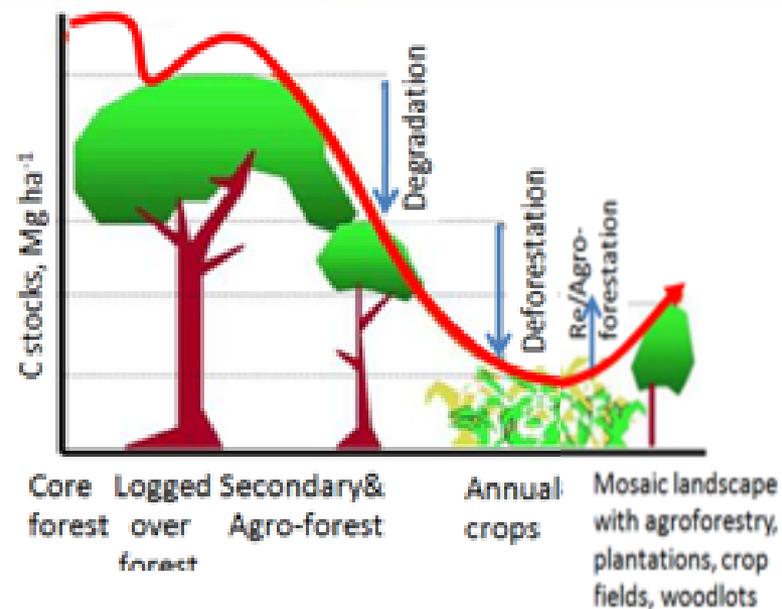
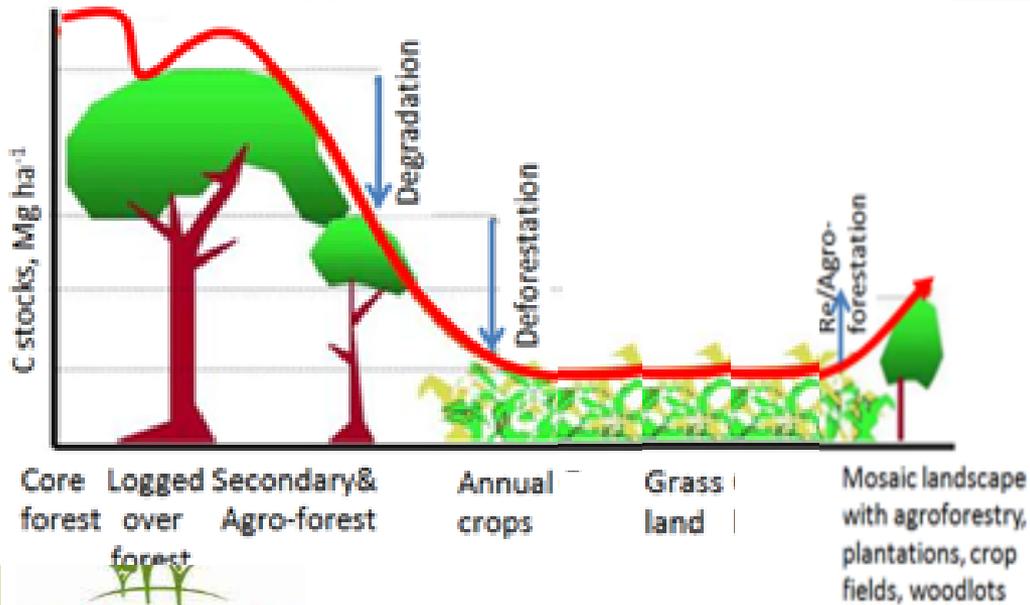


Tree cover transition



Widening: area planted < area cleared

Contracting: area planted > cleared

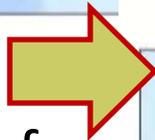


INCREASE OF MONOCULTURE TREE COVER VS LOSS OF CLOSED CANOPY-FOREST 1990-2000



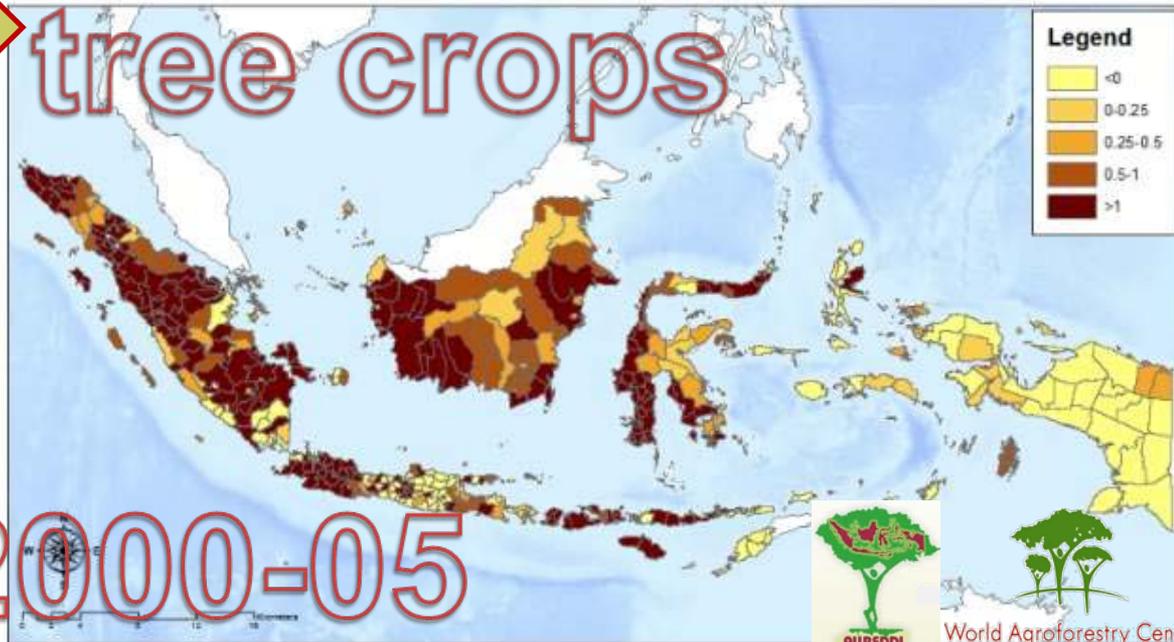
In the 1990's loss of natural cover increased the amount of 'low C-stock'/low economic value land; tree (crop) planting was 28% of the loss of natural forest area

logging



tree crops

INCREASE OF MONOCULTURE TREE COVER VS LOSS OF CLOSED CANOPY-FOREST 2000-2005



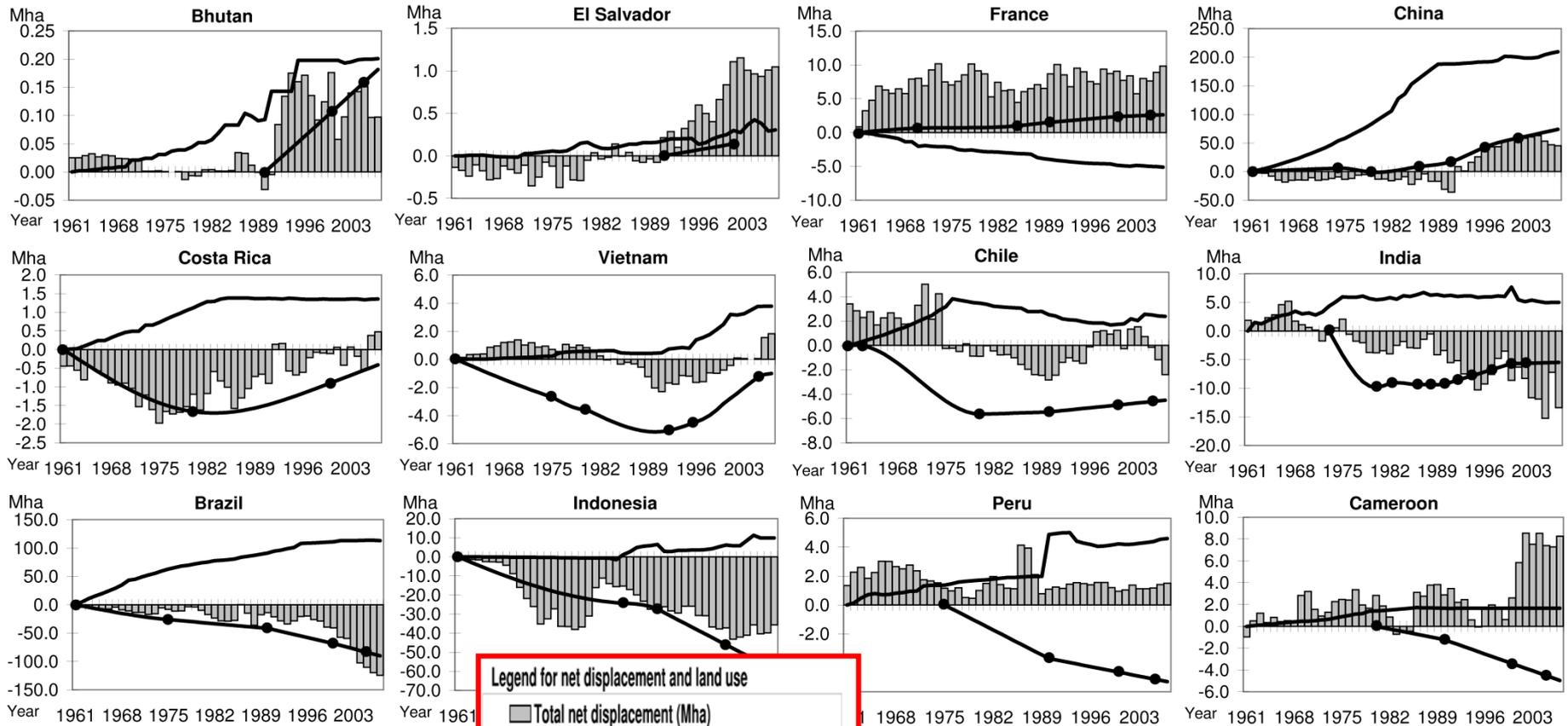
2000-05

After 2000 planting of tree (crop)s equals 90% of concurrent loss of natural forest; the amount of low C-stock/low economic value land decreases

How true is Borlaug -iV?

Displacement of land Use

A Net displacement and land use



Legend for net displacement and land use

- ▒ Total net displacement (Mha)
- Agricultural area change (base = 1961) (Mha)
- Forest area change (variable base year) (Mha)

Reflections - Drivers

- No single or key drivers at work- rather causal synergies (feedback / processes) between factors and factor groups with regional distinctions
- Decision-making processes at multiple levels most important for addressing drivers
- Scale is important Micro and macro fairly understood, but meso not so much
- Markets and trade (including changing consumer behavior) increasingly defining land use and landscapes

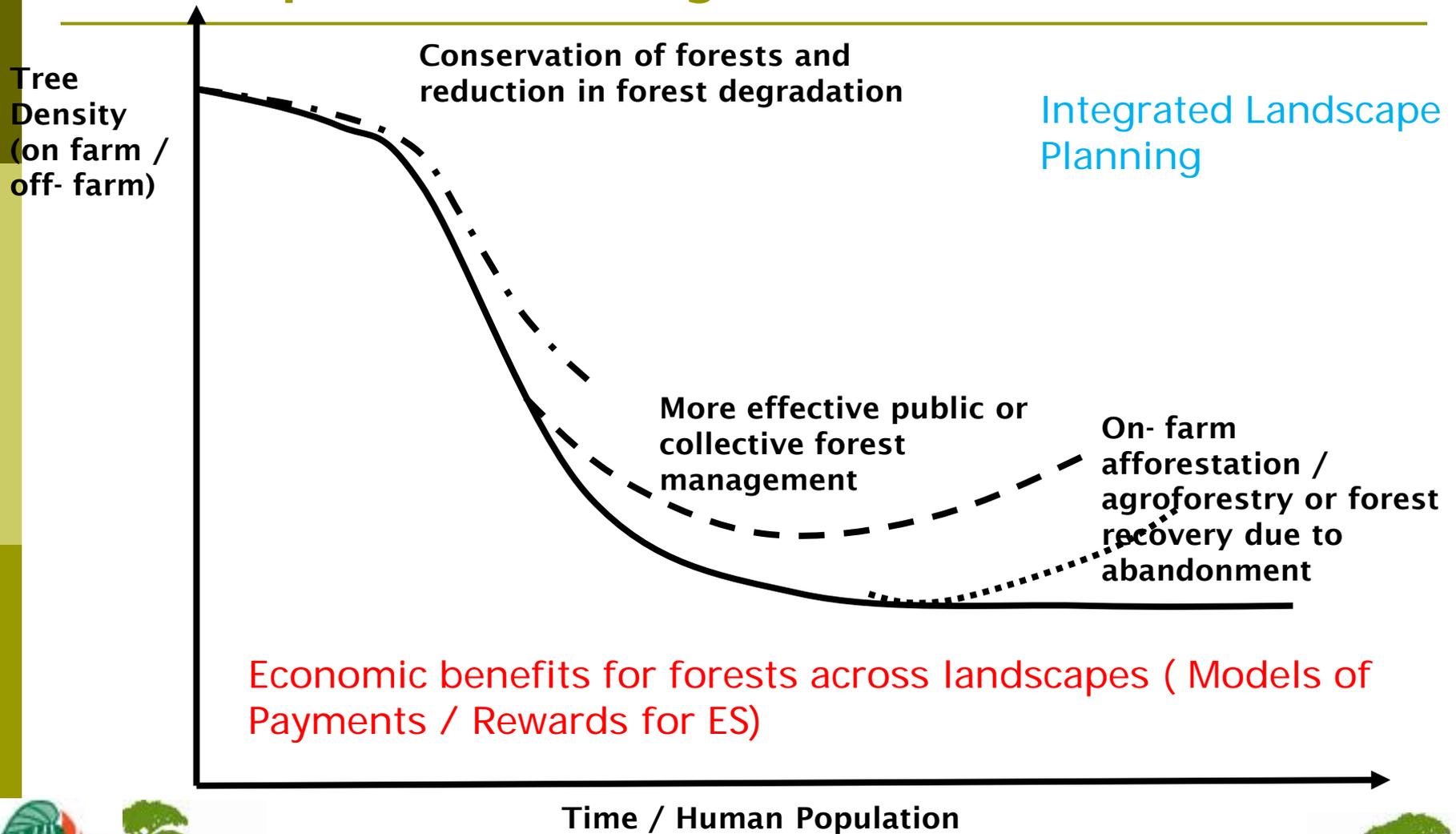


Reflections- II

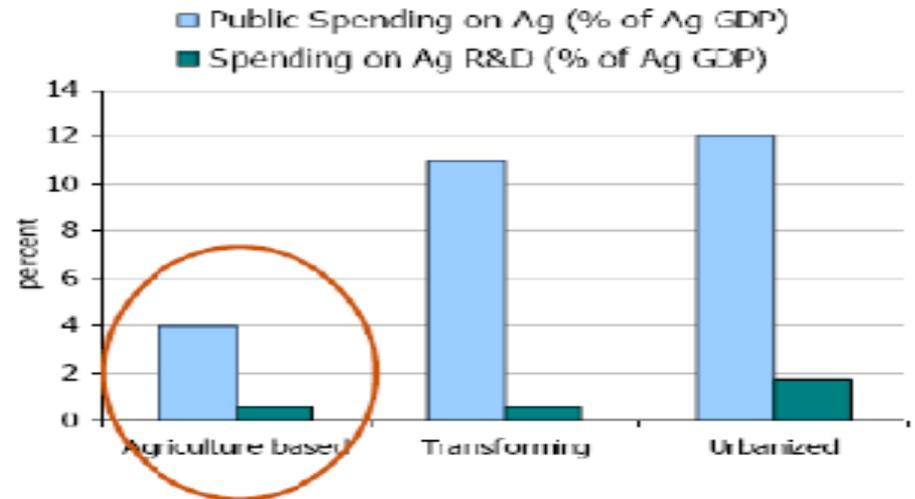
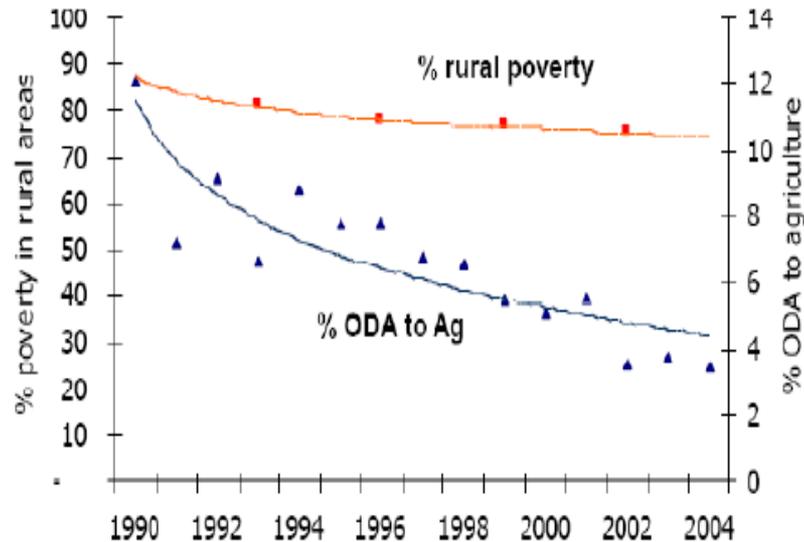
- Borlaug hypothesis largely not true in many cases
- Intensification not magic bullet- Potentially counter REDD
- Multiple policy instruments Needed
- Intensification in areas already cleared (non forested)
- Trees on farms and areas outside forests = viable pathway for intensification, REDD & reducing poverty
- Increase economic benefits from forest conservation – Payments/ Rewards for ES



REFLECTION: Multiple policies instruments for improving increasing tree / Forest cover in landscapes and all stages in Forest Transition



Reflections: Where extensification persists- Africa???



World Development Report, 2008

- Can REDD help knowledge development, extension, investments etc?



THANK YOU

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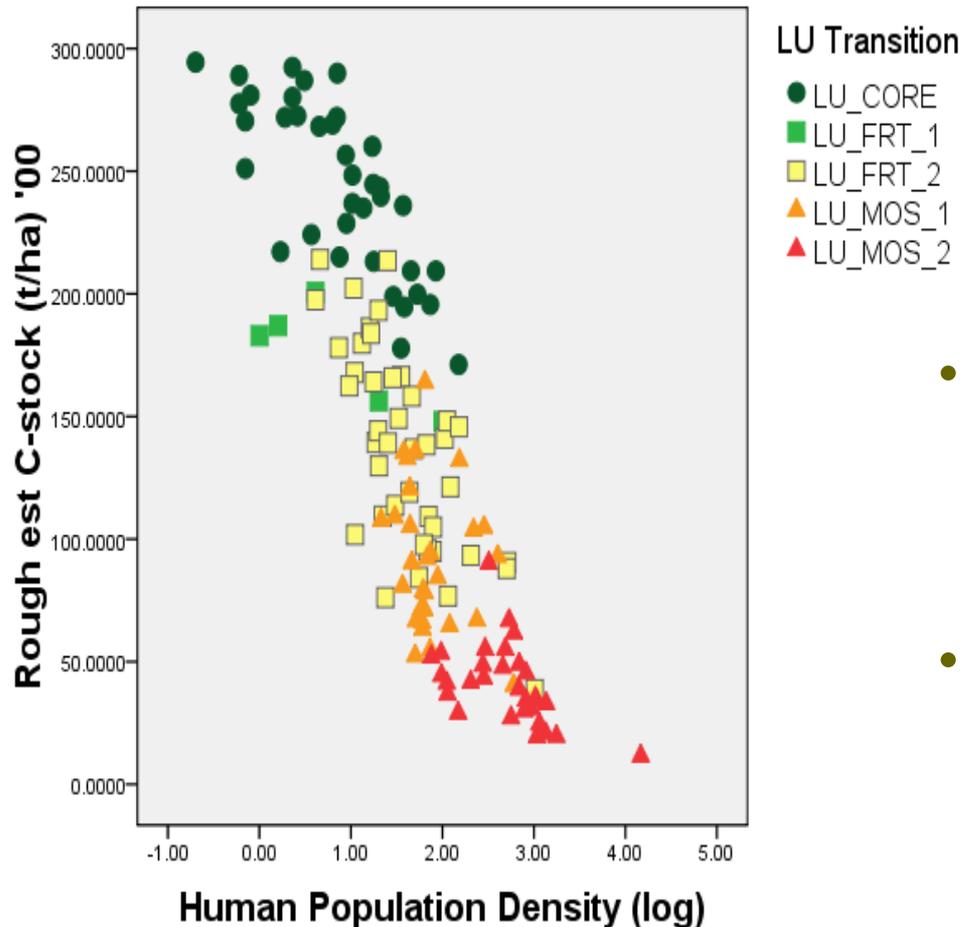


ASB Partnership for the Tropical Forest Margins



How true is Borlaug- LOCAL?

Some ASB evidence



- In Jambi and Lampung urban investments in tree crops & Migration: = Intensification = Higher returns to land = attract migrants
- Global cash crop markets changing migration and land use dynamic in Cameroon
- Relative profitability (Opp. Cost) of alternative land uses and labour shortages hampering adoption of more intensive land uses in Acre and Rondonia in Brazil