SPARING vs SHARING: ADDRESSING AGRICULTURAL DRIVERS OF DEFORESTATION

REFLECTIONS ON SPARING

Peter A Minang

ASB Partnership at ICRAF

World Agroforestry Centre (ICRAF)

Side Event
UNFCCC SBSTA Side Event, Bonn
June 8, 2011

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ASB

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

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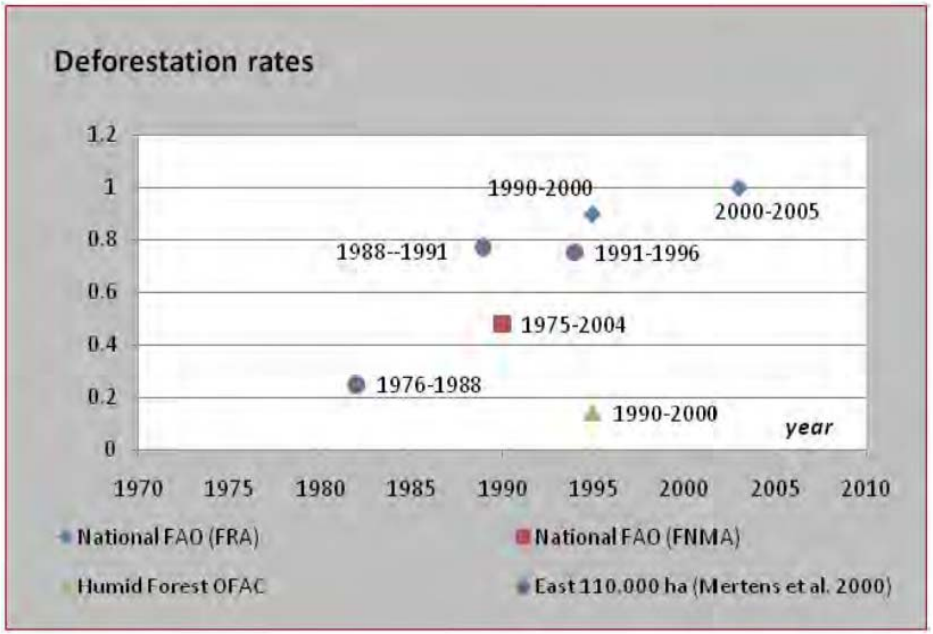
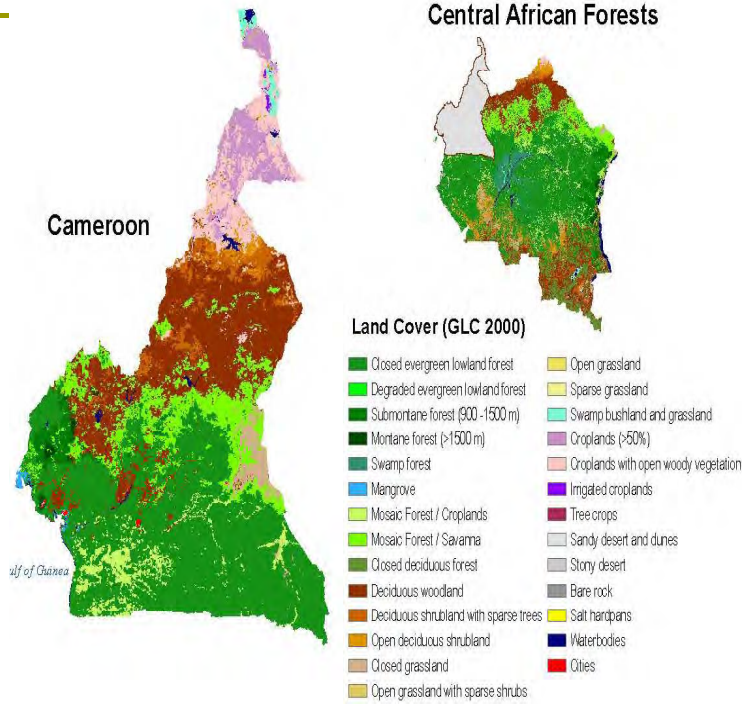
What is Deforestation? e.g. Cameroon





- Varied deforestation reported by various sources- sometimes significant
- Depending on what definition of forest is adopted?

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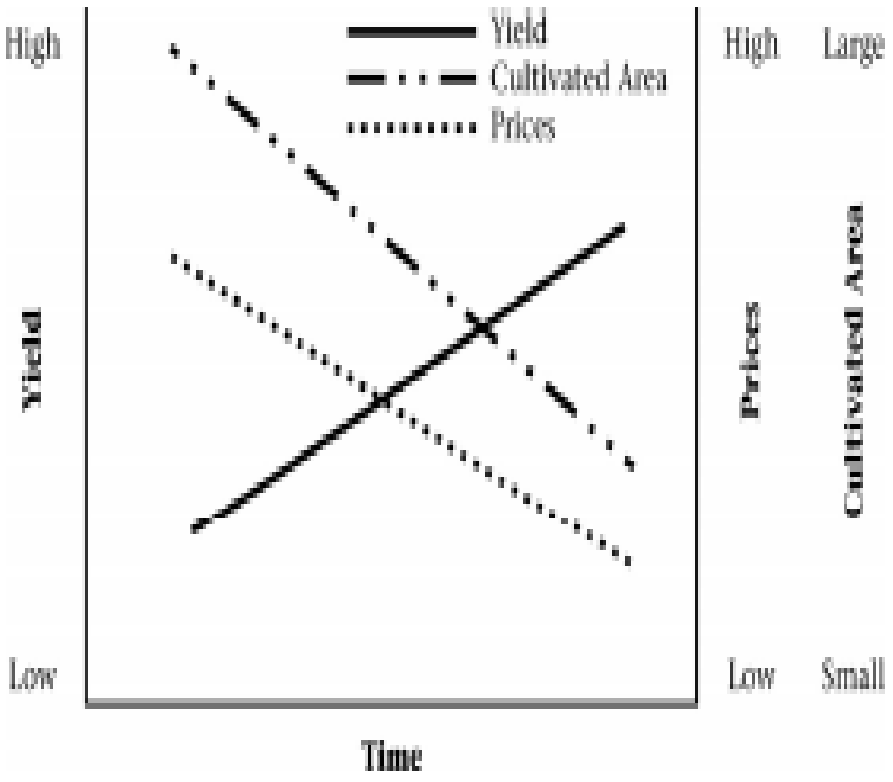
Can Intensification spare forests for REDD? Borlaug Hypothesis!!!!



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?????

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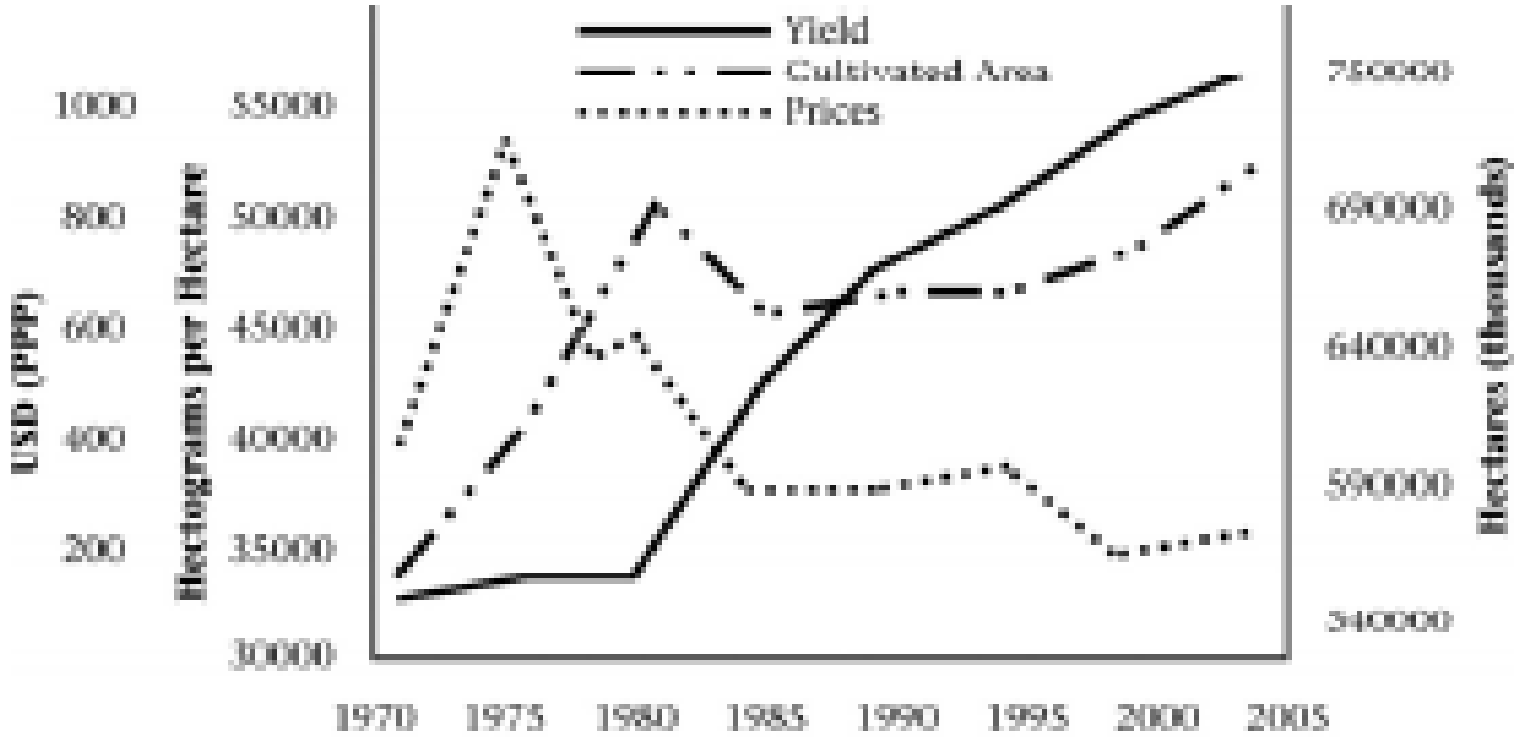
How true is Borlaug? -Global



Rudel et al., 2010

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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)

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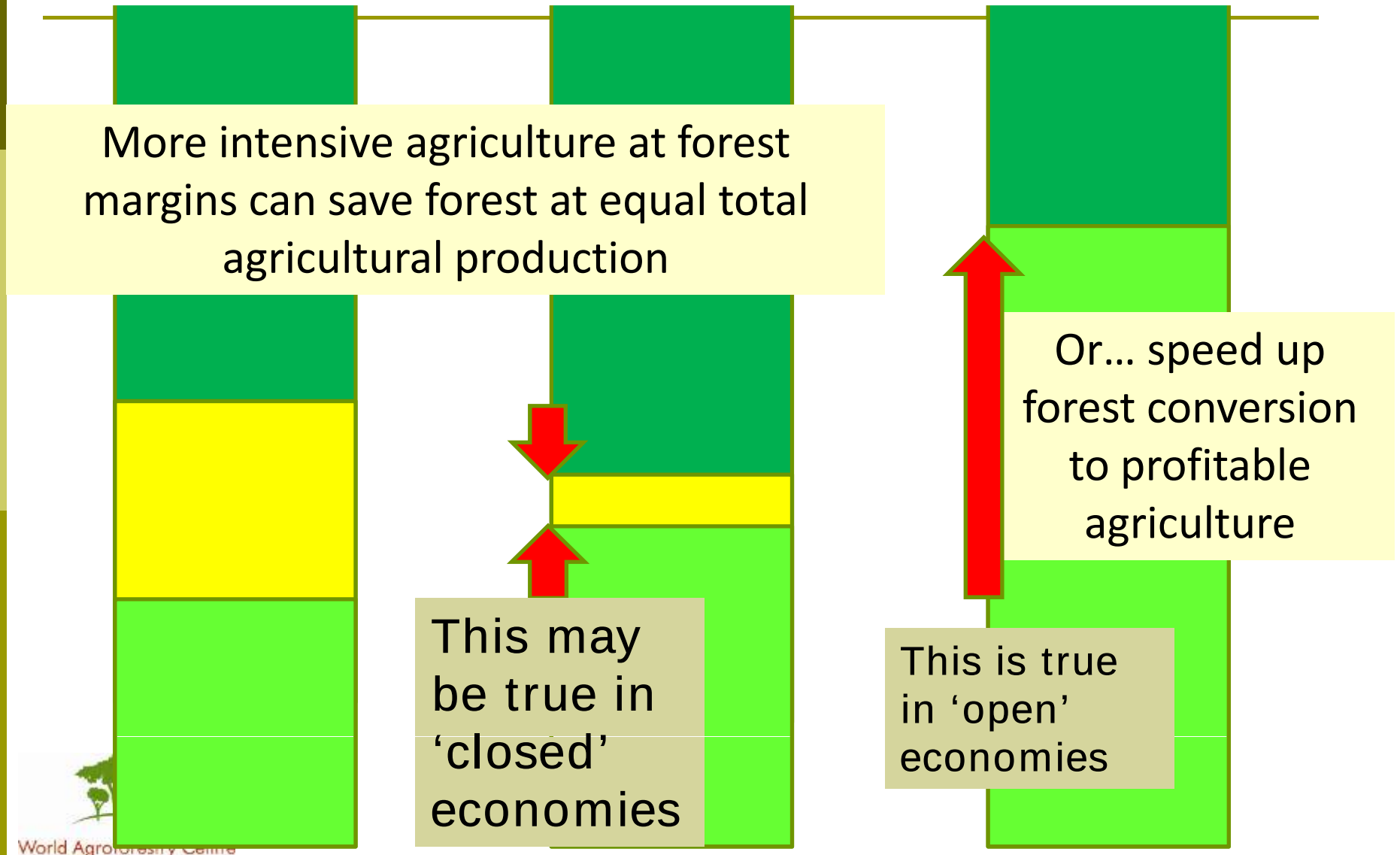
Agricultural intensification hypothesis

Remote forest edge communities & Planet earth are closed systems, in between we have 'open' systems…



How true is Borlaug- Global III?

- Agric production in Developing countries increased by 3.3 - 3.4 / yr in last 20 yrs; But 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).

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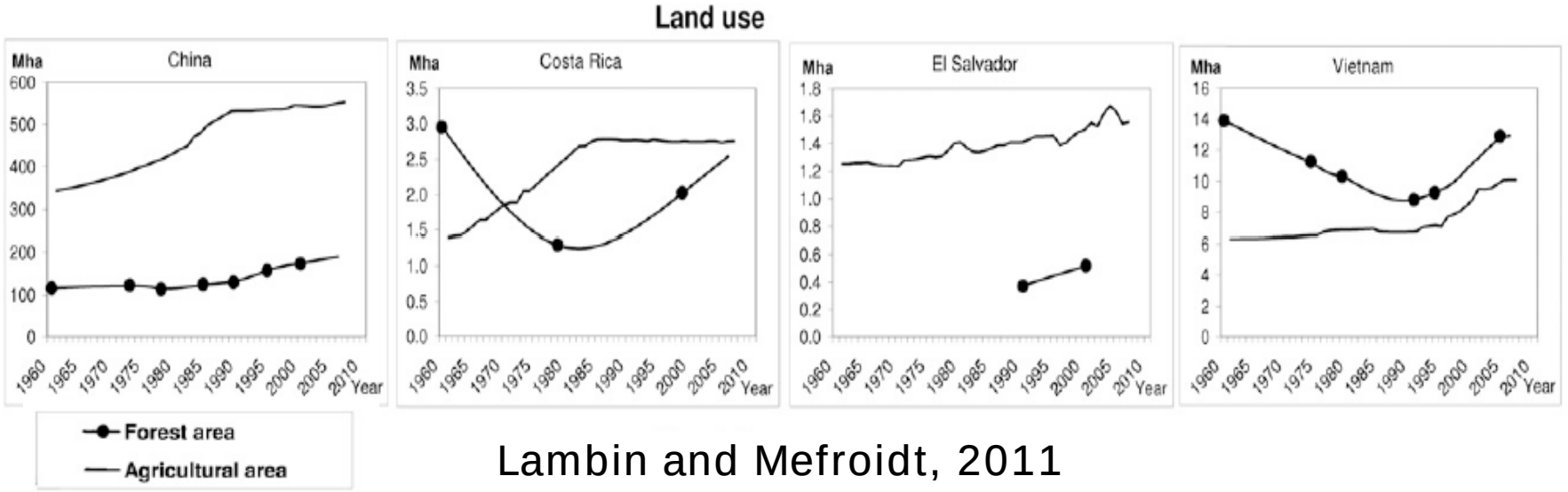
How true is Borlaug -Global IV?



Lambin and Mefroidt, 2011

- Some six countries have succeeded in increasing both Agric production area and Forest area (China, Costa Rica, El Salvador, Vietnam);
- But not from intensification only but through a combination of policies- (Lambin and Mefroidt, 2011- REDD ALERT Project);
- Most have done through displacement of Land use to other countries (Mefroidt et al. 2010 and ASB PB 17)

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Change in cereal production due to change in area and yield

Sub- Saharan Africa

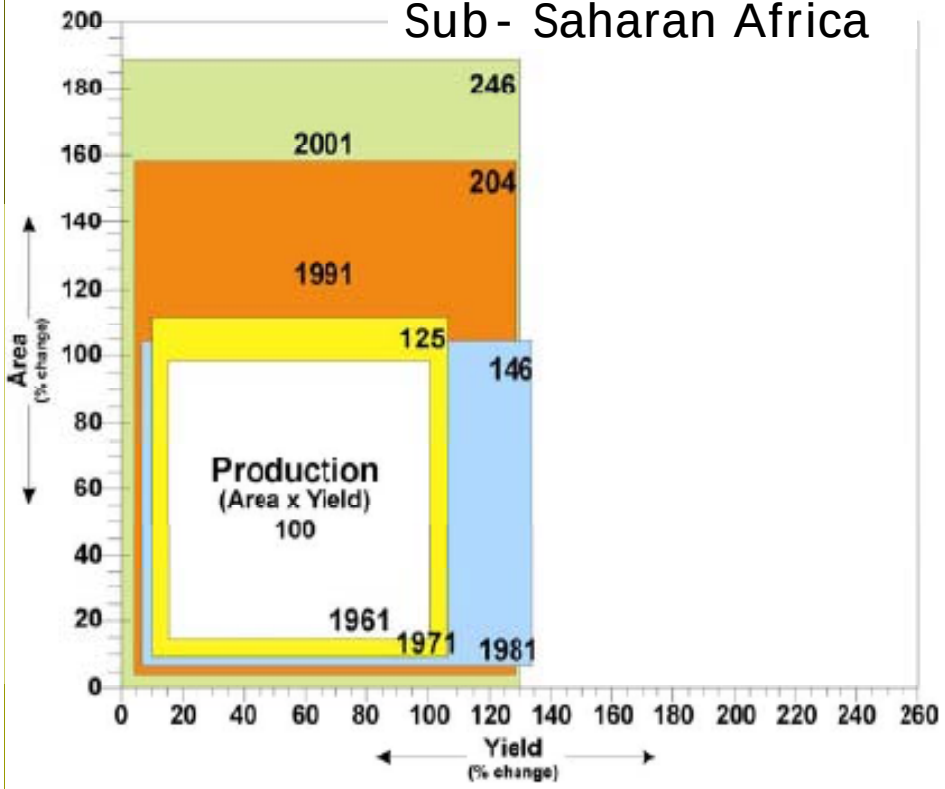

Figure 1. Changes in Cereal Production in Sub-Saharan Africa Due to Changes in Area and Yield (1961 = 100)

Asia

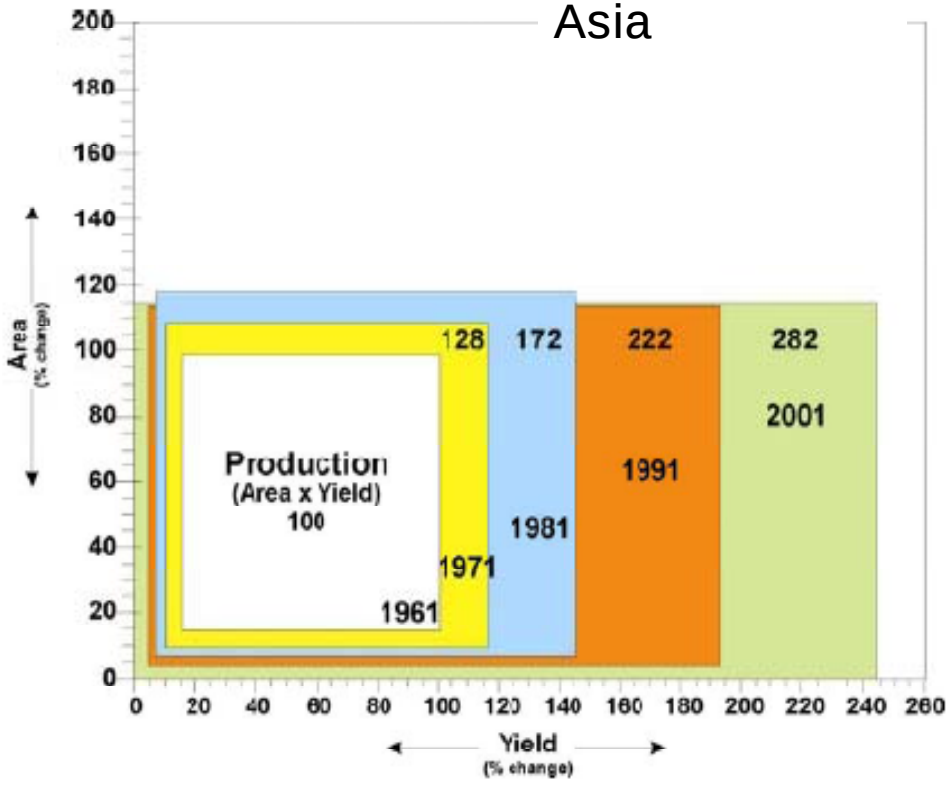

Figure 2. Change in Cereal Production in Asia Due to Changes in Area and Yield (1961 = 100)

How true is Borlaug- LOCAL?
Some ASB evidence
(ASB-Indonesia, 1995; ASB- Brazil, 2002)

- In Jambi and Lampung urban investments in tree crops & Migration: = Intensification = Higher returns to land = attract migrants

- Relative profitability (Opp. Cost) of alternative land uses and labour shortages hampering adoption of more intensive land uses in Acre and Rondonia in Brazil

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Indonesia-Jambi: Jostling for profits

(ASB-Indonesia Tommich et al., 1995)

- Local smallholder farmers, migrants, loggers, large-scale tree crop estates- oil palm, rubber, cocoa, coffee (including industrial timber plantations) and
- Government sponsored resettlement schemes in Central Summatra accelarated deforestation
- Years of economic growth also created huge pool of absentee landlords (Urban investors) competing for tree crop estates
- The 1997 currency collapse made land conversions to tree crops profitable

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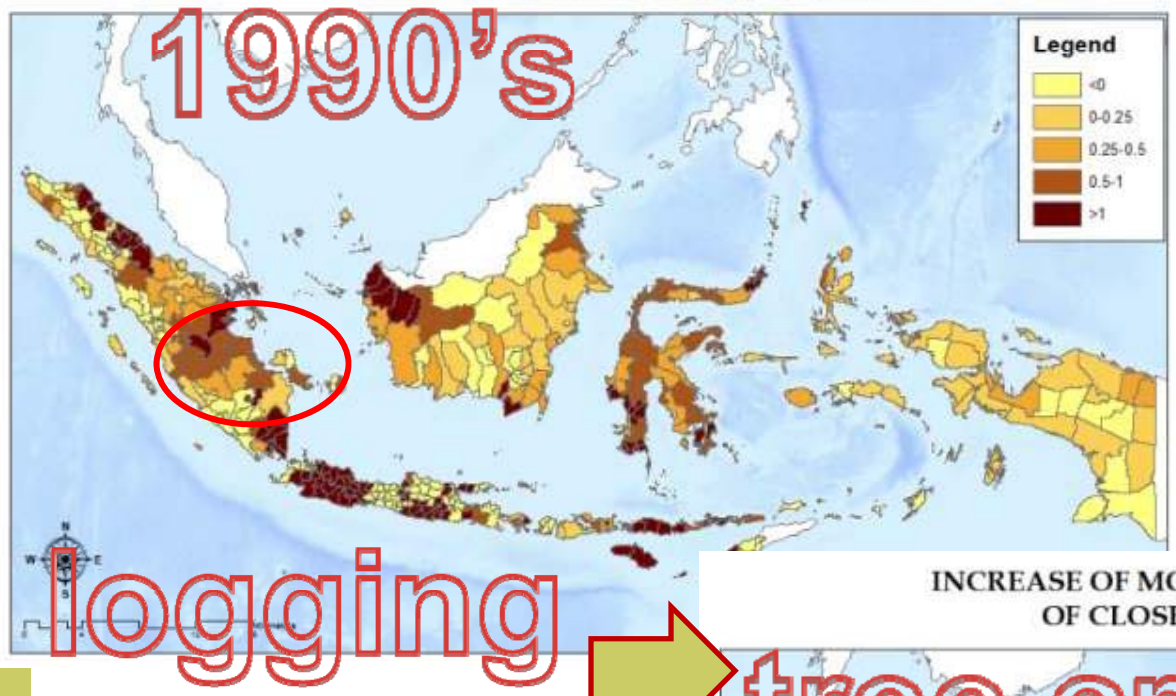
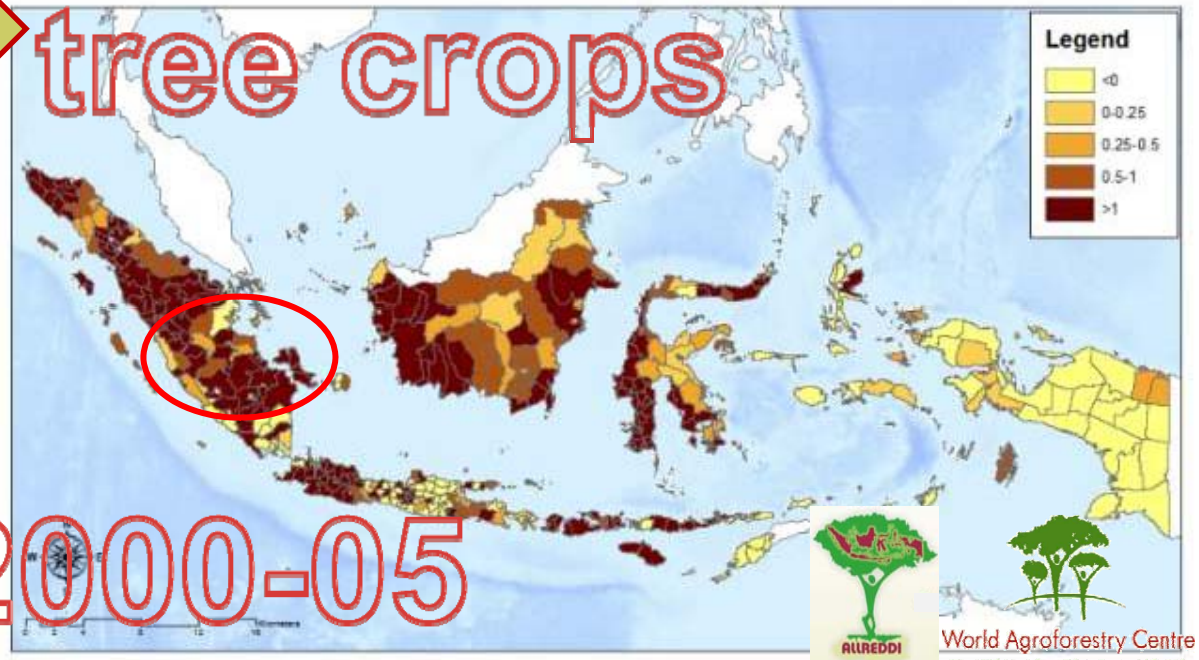
INCREASE OF MONOCULTURE TREE COVER VS LOSS OF CLOSED CANOPY-FOREST 1990-2000



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

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



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

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Brazil:

(ASB Brazil- Vosti et al., 2002)

- Pedro Peixoto-Acre and Theobroma-Rondonia
- Built mainly between late 60s and 80s through government sponsored Migration policies
- ASB Research since 1994

Figure 2.1 Map locating Theobroma and Pedro Peixoto in the states of Rondônia and Acre

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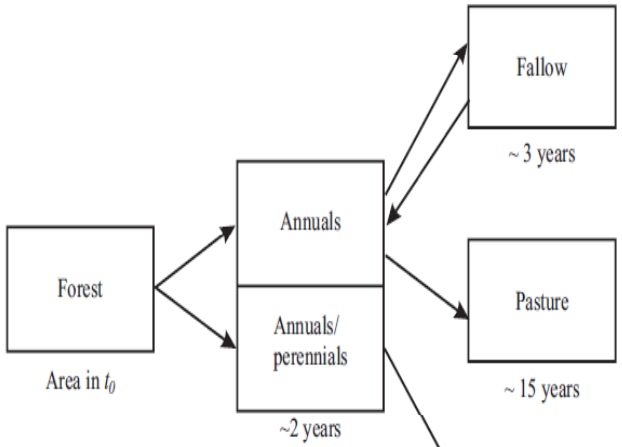
Cattle profitability and labour shortages preventing adoption of alternatives

- Deforestation by settlers primarily for pastures despite strengthening of rules and regional market links, incomes etc
- Extensive Livestock prod- favored by relative profitability and labour constraints

Figure 2.2 Land use trajectories and deforestation



	Mean	SD	N
Area felled	4.67 hectares	2.85	124
Frequency	2.14 years	1.05	129

Notes: The number of years noted below each land use box indicates time continuously in a given land use and not the time elapsed from t_o

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Looking ahead through scenarios

Figure 4.14 Land uses, baseline simulations using 1996 prices

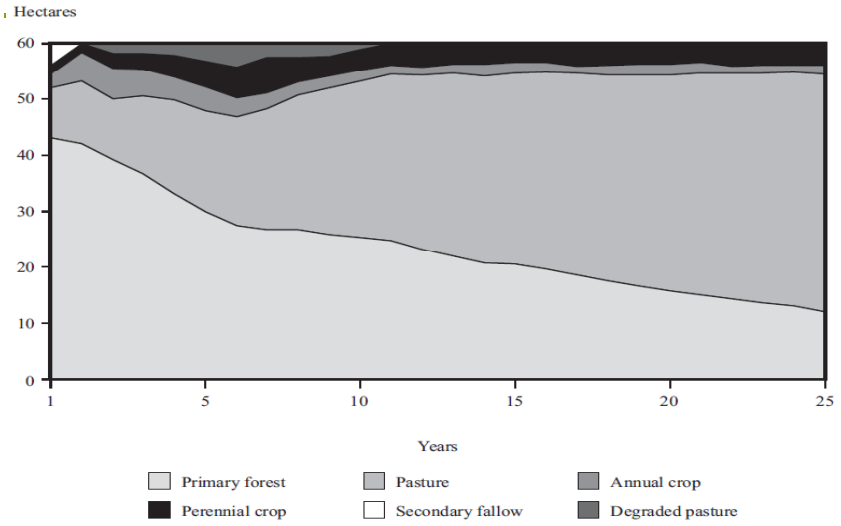

Figure 4.24 Land uses with managed forestry permitted and a 50 percent fertilizer subsidy, 1996 prices and relaxation of labor market constraints

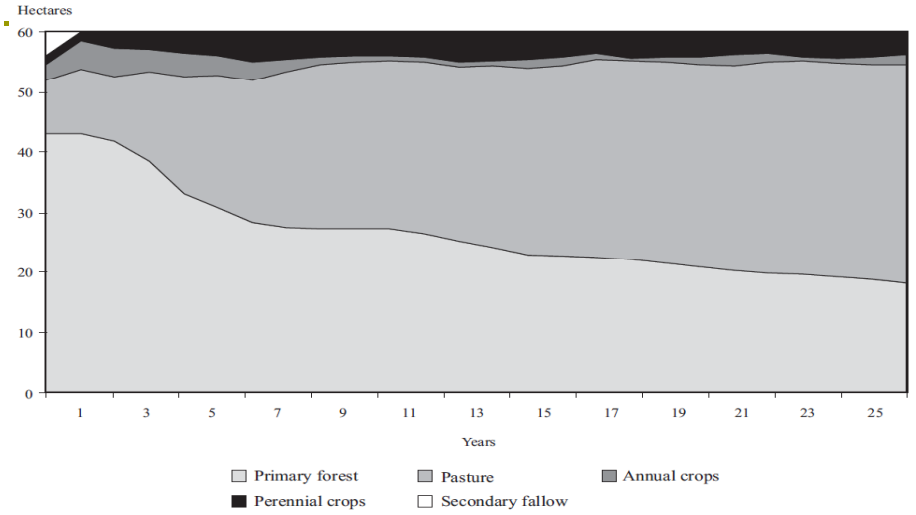

Table 4.5 Summary of sensitivity analysis for the linear programming model

	Does this variable affect		
Variable	**Deforestation**	**Use of cleared land**	**Income**
Soil quality	No	No	Yes
Labor availability	Yes	No	Yes
Prices	No	Yes	Yes
Discount rate	No	No	No
Distance to market	Yes	No	Yes
Market access	Yes	Yes	Yes

Reflections I: what does intensification mean?

- Increasing yield per hectare(possibly with increase costs in labour and capital inputs;
- Increasing cropping intensity (i.e. two or more crops) per unit of land or other inputs (e.g. water);
- Change land use from low-value crops or commodities to high value market priced commodities (Pretty et al. 2011)

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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

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Therefore

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

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

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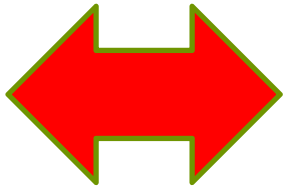
Sparing vs Sharing
Segregate vs Integrate

- Sparing/segregate ***intensification hypothesis***



- Sharing/integrate ***multifunctionality hypothesis***

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THANK YOU
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