

Sustainable land use for the 21st century

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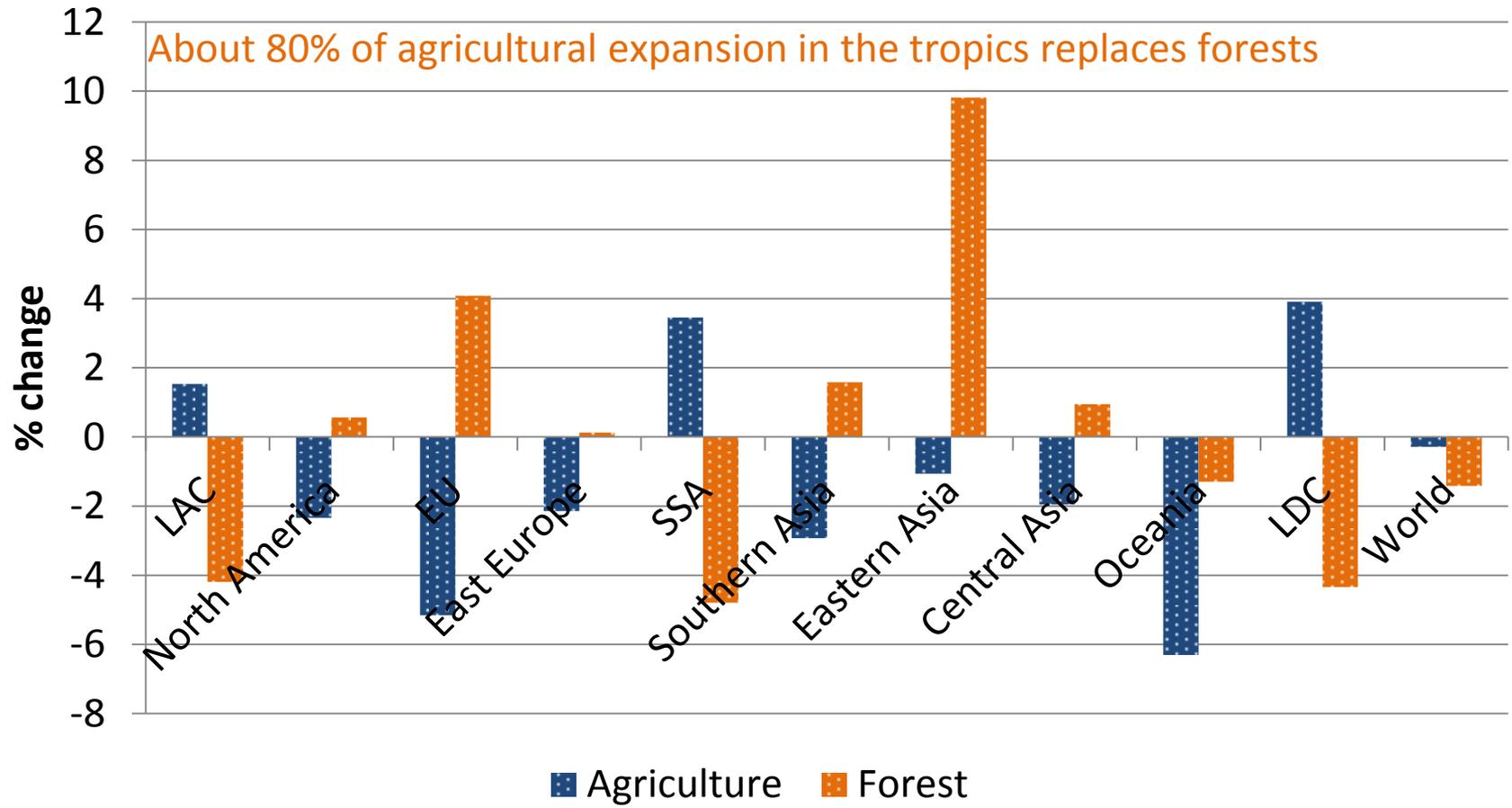
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Outline

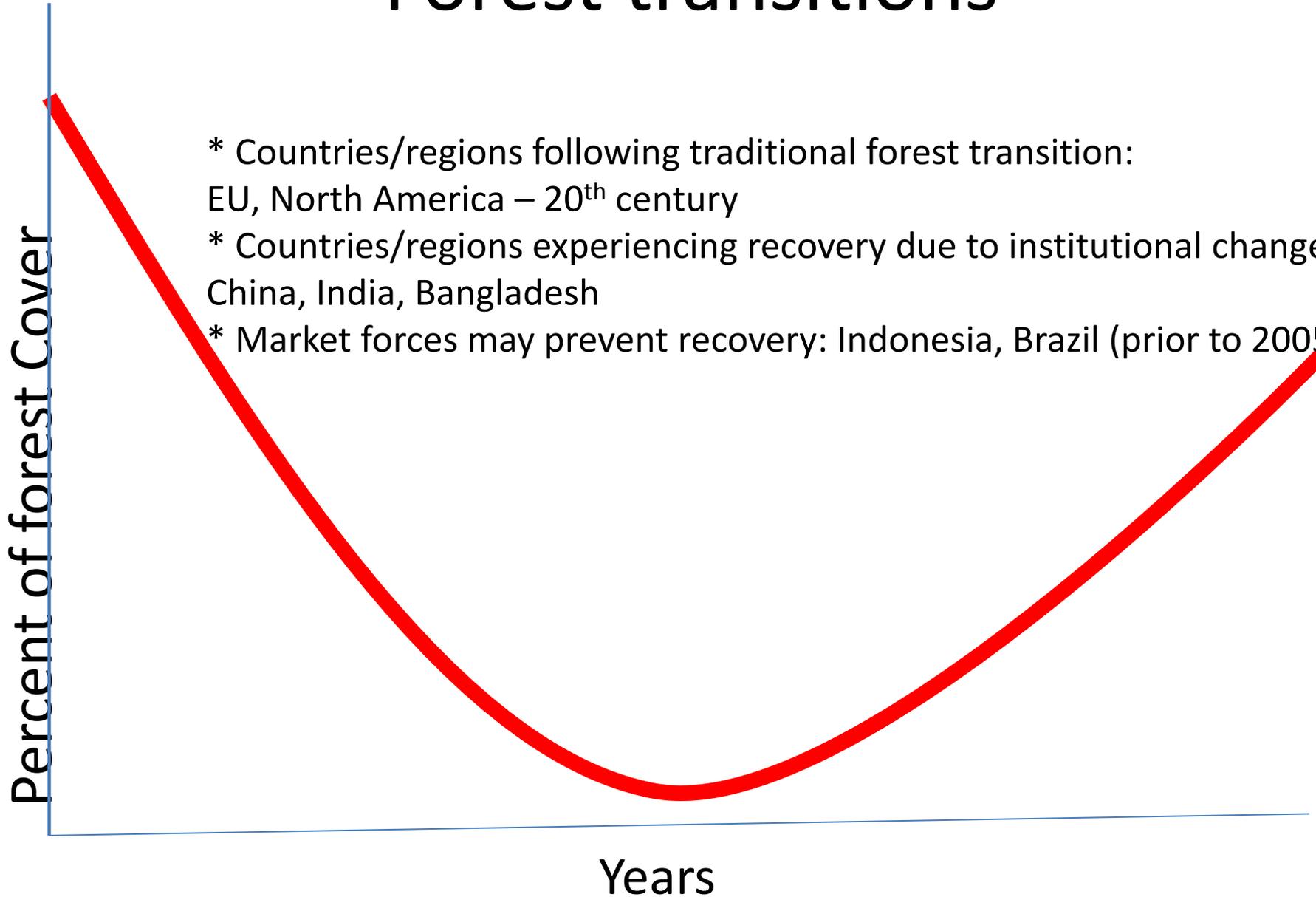
- Global trends of LUCC – forests & agriculture
- Case studies of LUCC: Brazil, Indonesia & DRC
- Prospects for the future

Change of agriculture and forest area, 1992-2009



Forest transitions

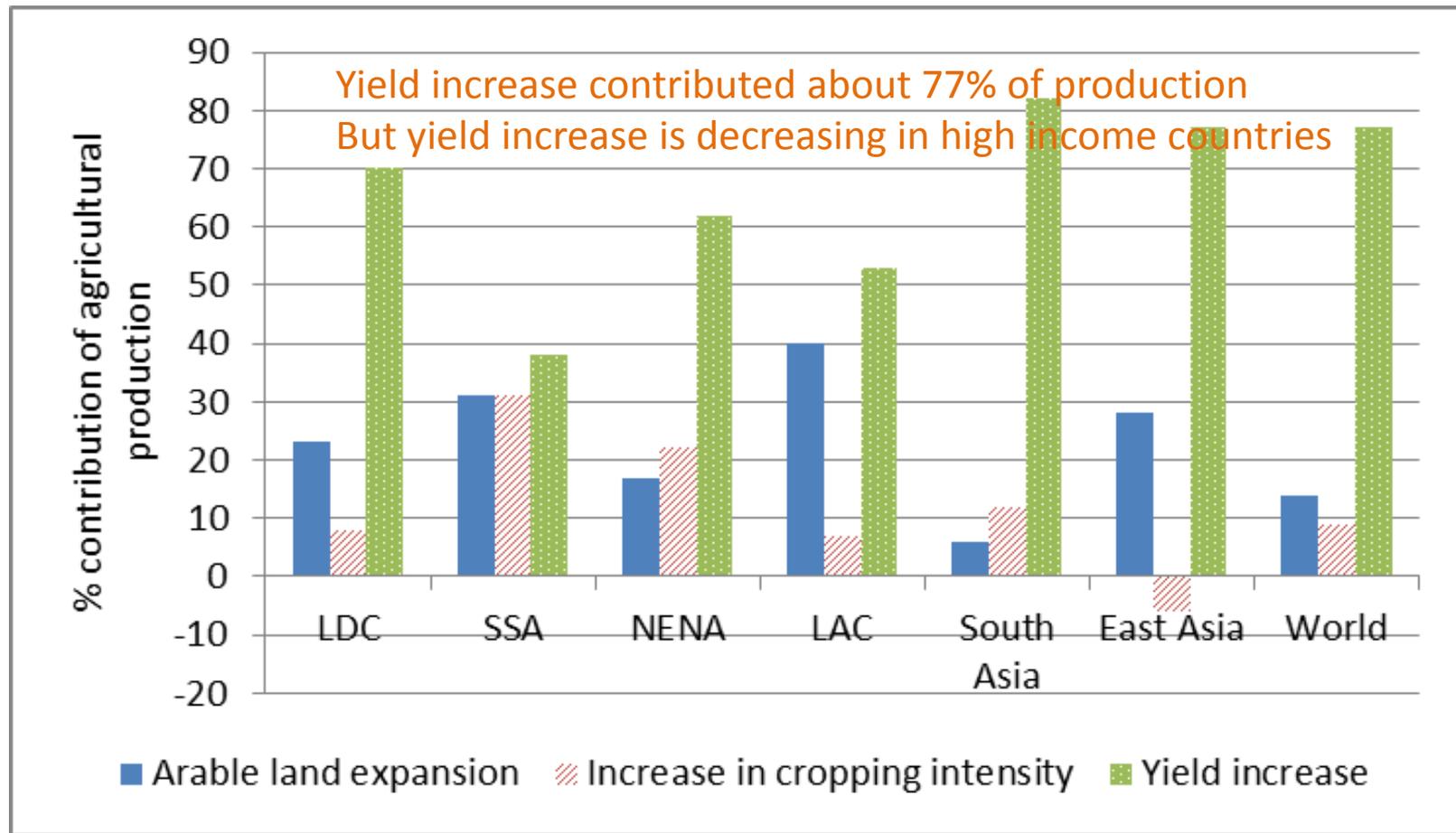
- * Countries/regions following traditional forest transition:
EU, North America – 20th century
- * Countries/regions experiencing recovery due to institutional change
China, India, Bangladesh
- * Market forces may prevent recovery: Indonesia, Brazil (prior to 2005)



Global forest transition

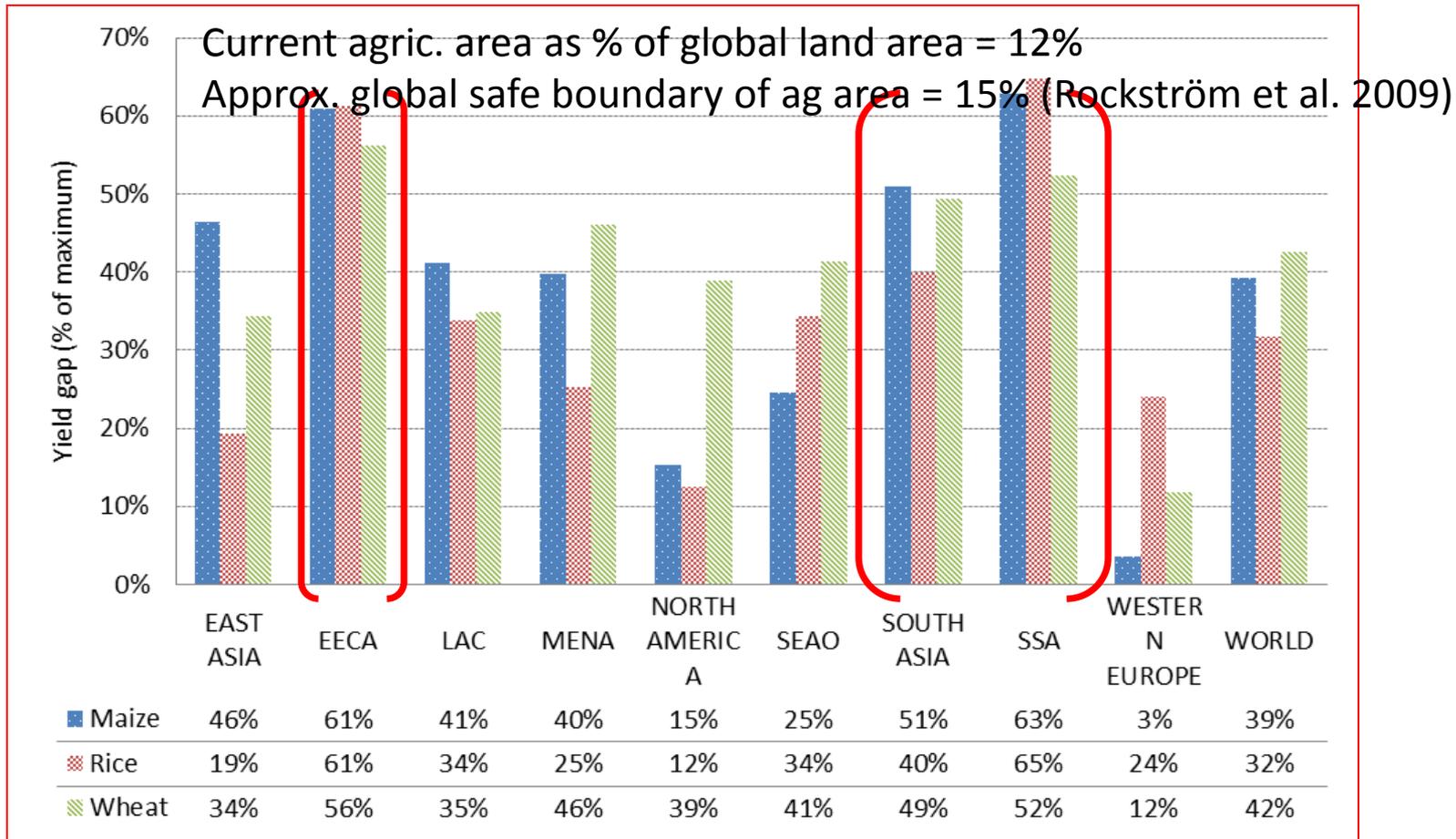
Regions/countries	Threshold - End of net deforestation	Main reason(s)
Europe	End of 19 th century	Industrial revolution, Growing urban population, increasing environmental value
North America	End of 19 th century	
China	1980's	PES, tree planting programs to head off flooding, dust storms, etc & effectiveness forest governance
India	1990's	National tree planting programs; community forest management; growing rural non-farm activities
Bangladesh	1990-2000	Social forestry, forest planting programs – poverty still entrenched
Niger	1990s?	Tree tenure, increased rainfall, tree planting programs

Sources of growth of food production, 1961-2005



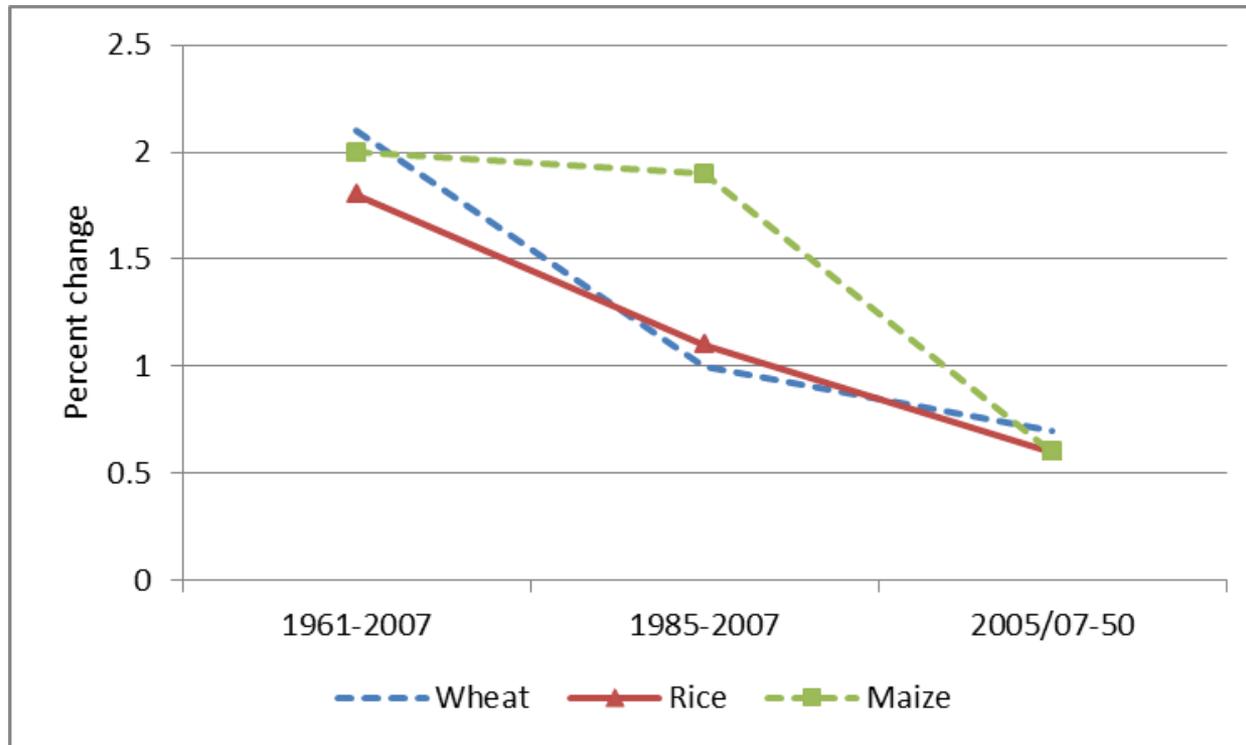
Source: Bruinsma, 2009

There is hardly room for agricultural expansion, so yield gap should be closed – especially in LDCs



Source: Licker et al 2010

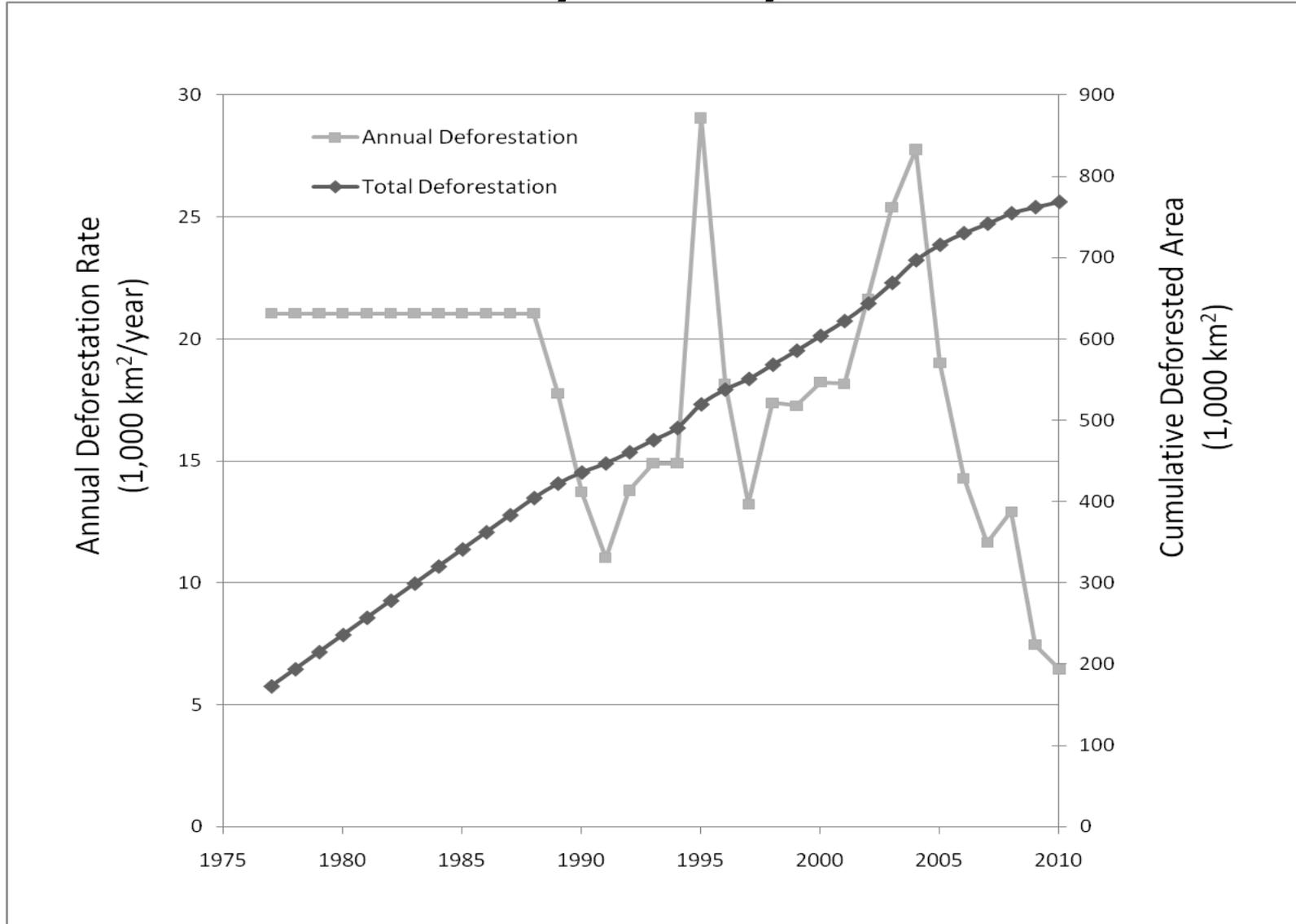
Decreasing global yield trend is due to narrow gap in high income countries



- Closing yield gap in LDC provides largest potential for achieving global sustainable Food security
- This requires addressing constraints to higher yields in LDCs

How land use change happen in practice?
Case of Brazil, Indonesia & DRC

Brazil reduced deforestation by 74% in only five years



Indonesia

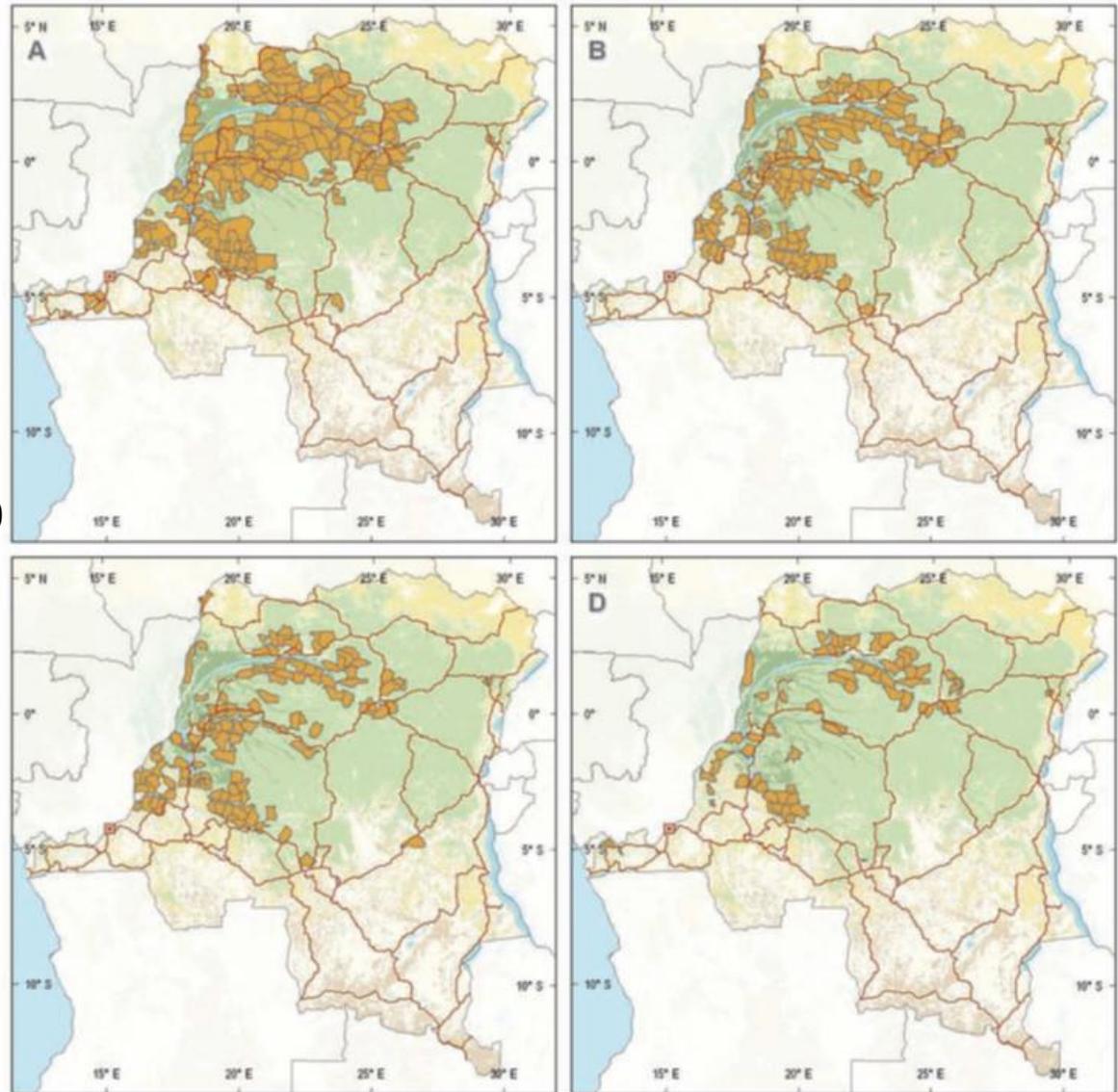
- The palm industry - driving forces of deforestation (Grieg-Gran 2008).
- Commercial logging ~ 60% of Indonesia's 100 million ha of forest allocated to commercial logging between 1970s to 2000 → 70 million m³ annual harvesting (sustainable level =25 million m³) (Casson 2001).
- Decentralization of forest management contributed to the deforestation
- Indonesia entered into contract with Norwegian to suspend all concessions. Deforestation rate fell from 1.7% in 1990-2000 - to only 0.5% in 2000-2010 (FAO 2011)

DRC

- Poor infrastructure & insecurity has led to limited logging and other forms of forest harvesting in DRC
- CDM and other international instruments are hard to implement in DRC due to the weak institutions.

DRC: Changes in area allocated to timber concessions

	A	B	C	D
Year	2000	2003	2007	2009
Area (million ha)	42	25	26	12



Source: Mertens and Bélanger, 2010

Prospects for the future

- Food security is achievable but this will largely be done by closing the gap between crop yield potential and actual yield – especially in SSA, South Asia and central Asia.
 - This will require investments in multiple sectors to address agricultural constraints.
- Strong environmental policies and institutions play key role in LUCC both in high and low income countries
- Recent international **cooperation in environmental management** has offered hope for addressing the environmental management challenges. But such efforts have been **more effective in countries with efficient markets**. In countries with weak markets & institutions, market based instruments have remained a challenge.
- Recent Rio +20 had little to say about REDD+, climate change, etc in its “***The future we want***”. This illustrates the challenges of reaching international agreements on sustainable LUCC