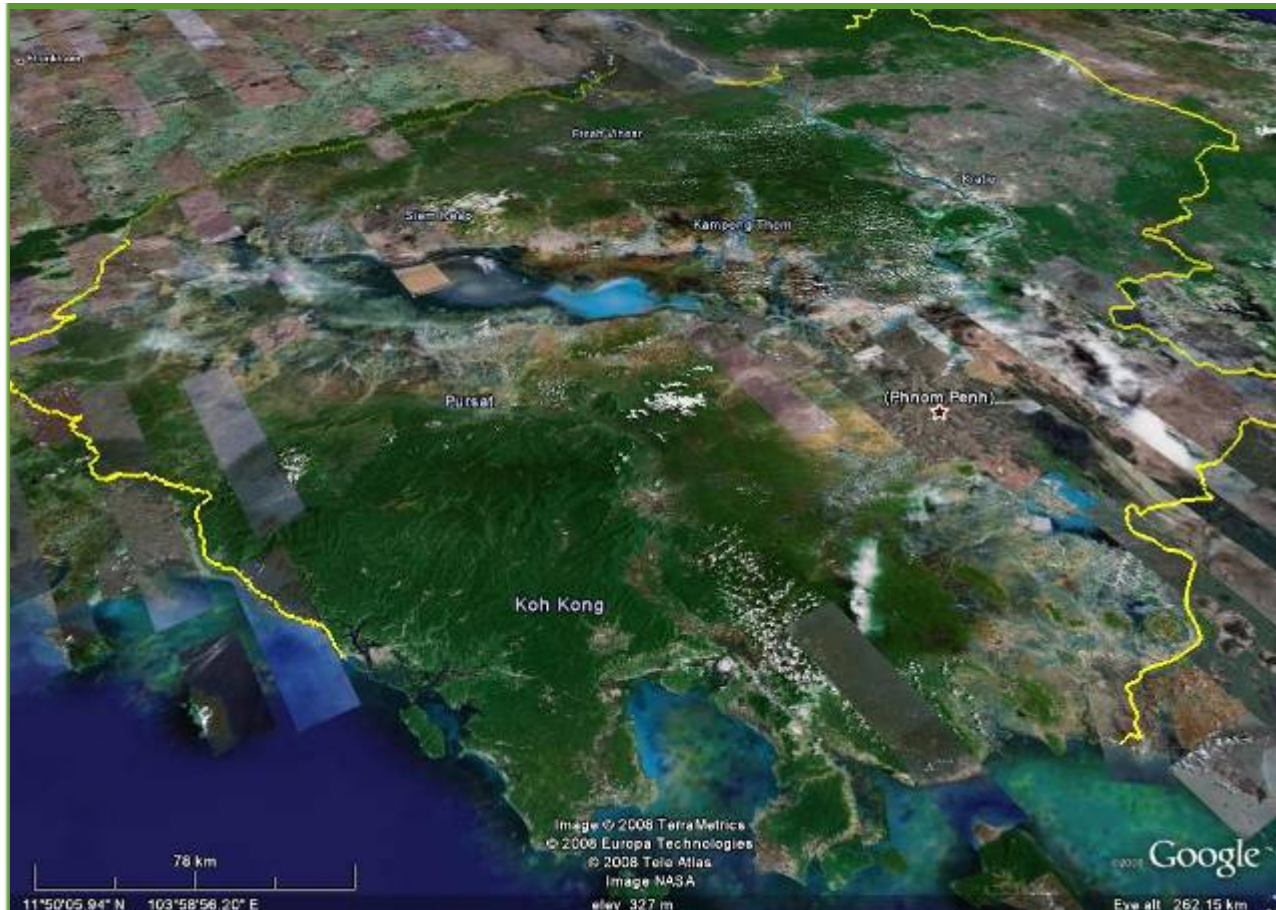


Greater Cardamom Mountains Sustainable Development Vision

Reconciling Conservation and Development



Timothy J. Killeen,
Center for Applied
Biodiversity Science

11 June 2008



CONSERVATION
INTERNATIONAL

Development Priorities

- Economic growth
- Poverty reduction
- Food security
- Energy security

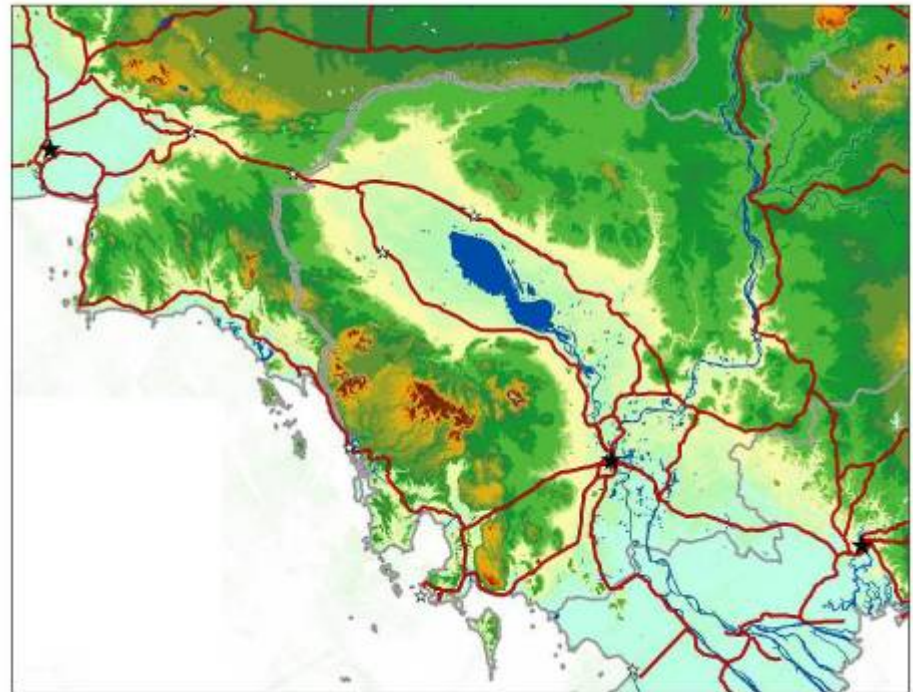
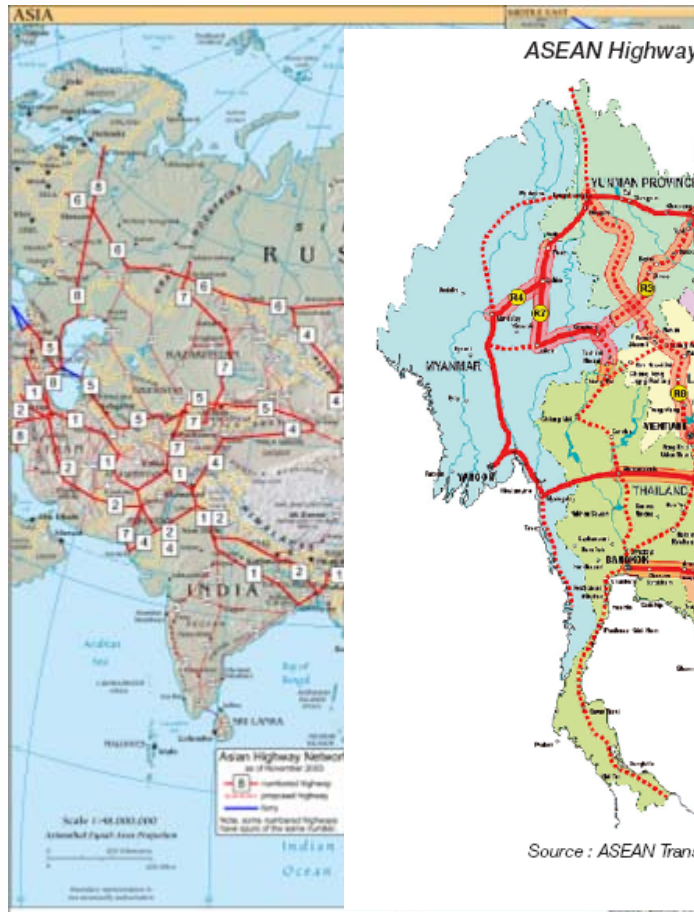


Conservation Priorities

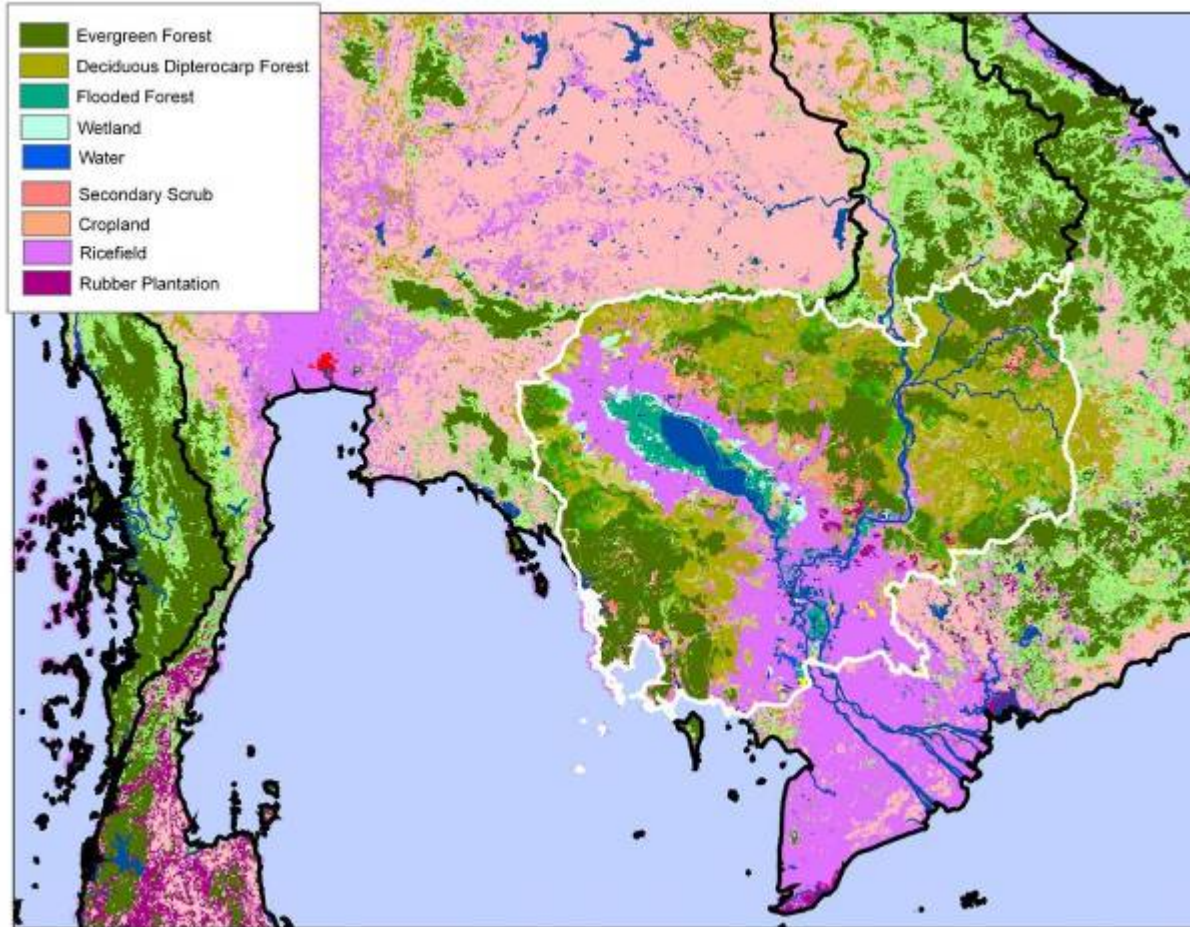
- Species extinctions
- Deforestation
- Aquatic ecosystems
- Climate change



- Regional Trade
- Exports
- Investments
- Economic Growth



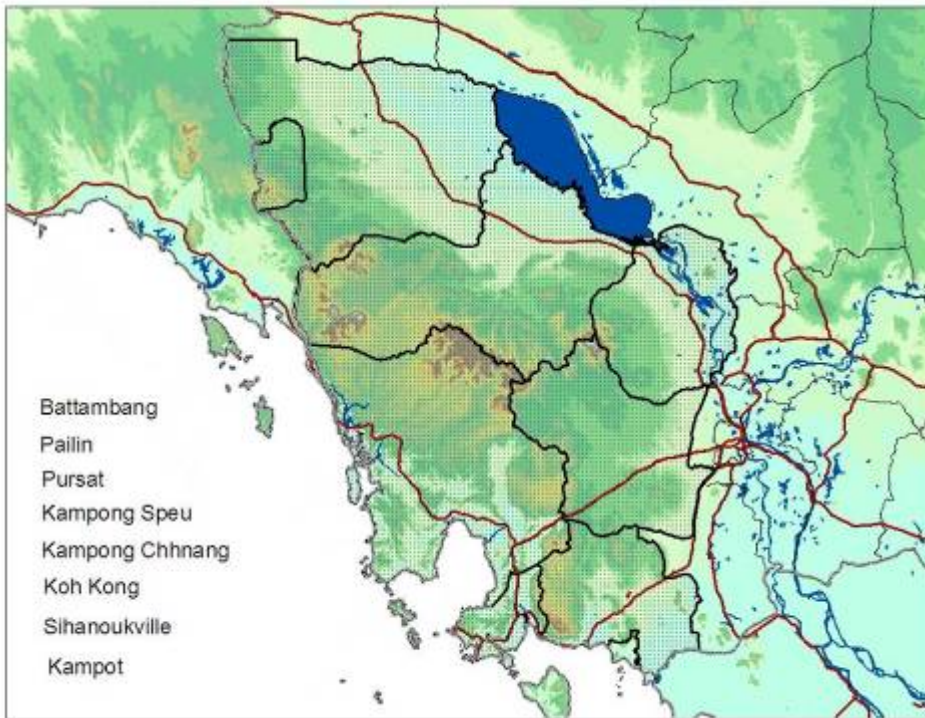
Conservation Opportunities



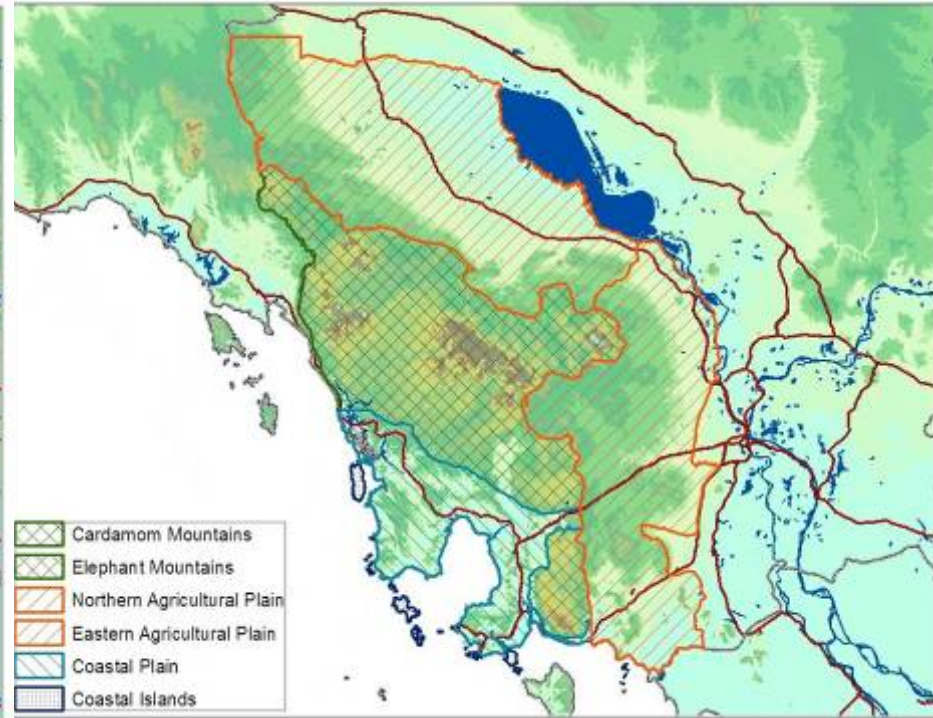
~ 60% forest

- Rain forest
- Dry forest
- Woodlands
- Tonle Sap
- Mekong River
- Mangroves
- Endemic spp.

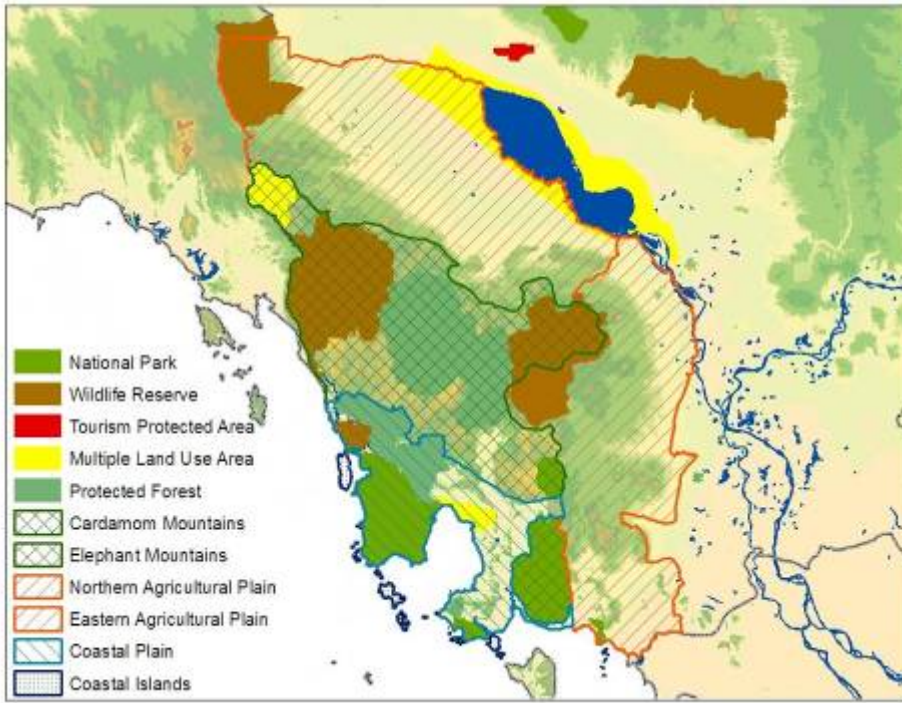
5,367,000 hectares --- 30% of Cambodia



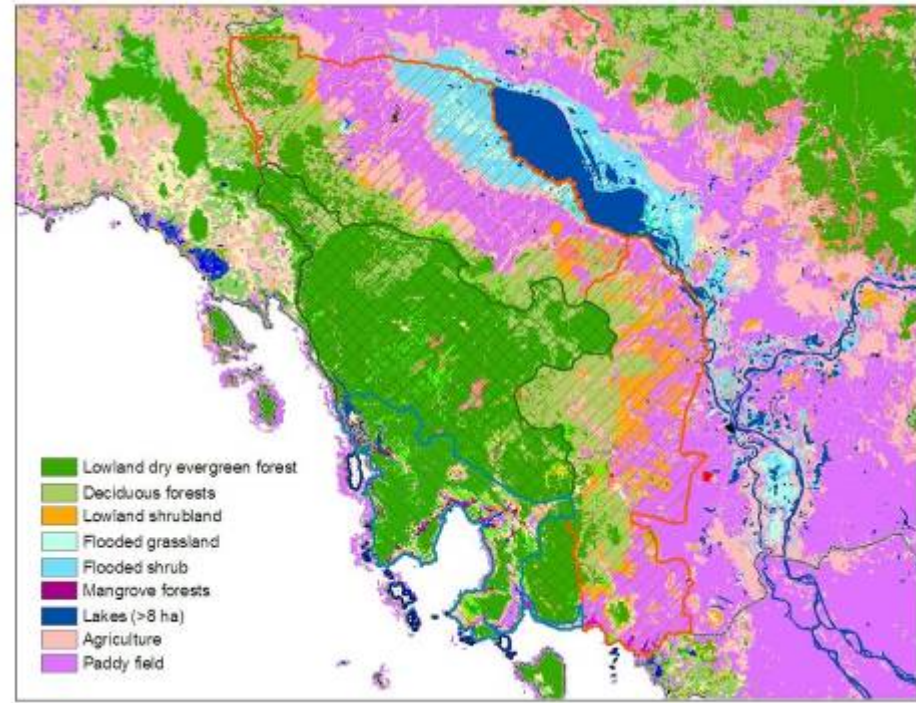
Seven Provinces



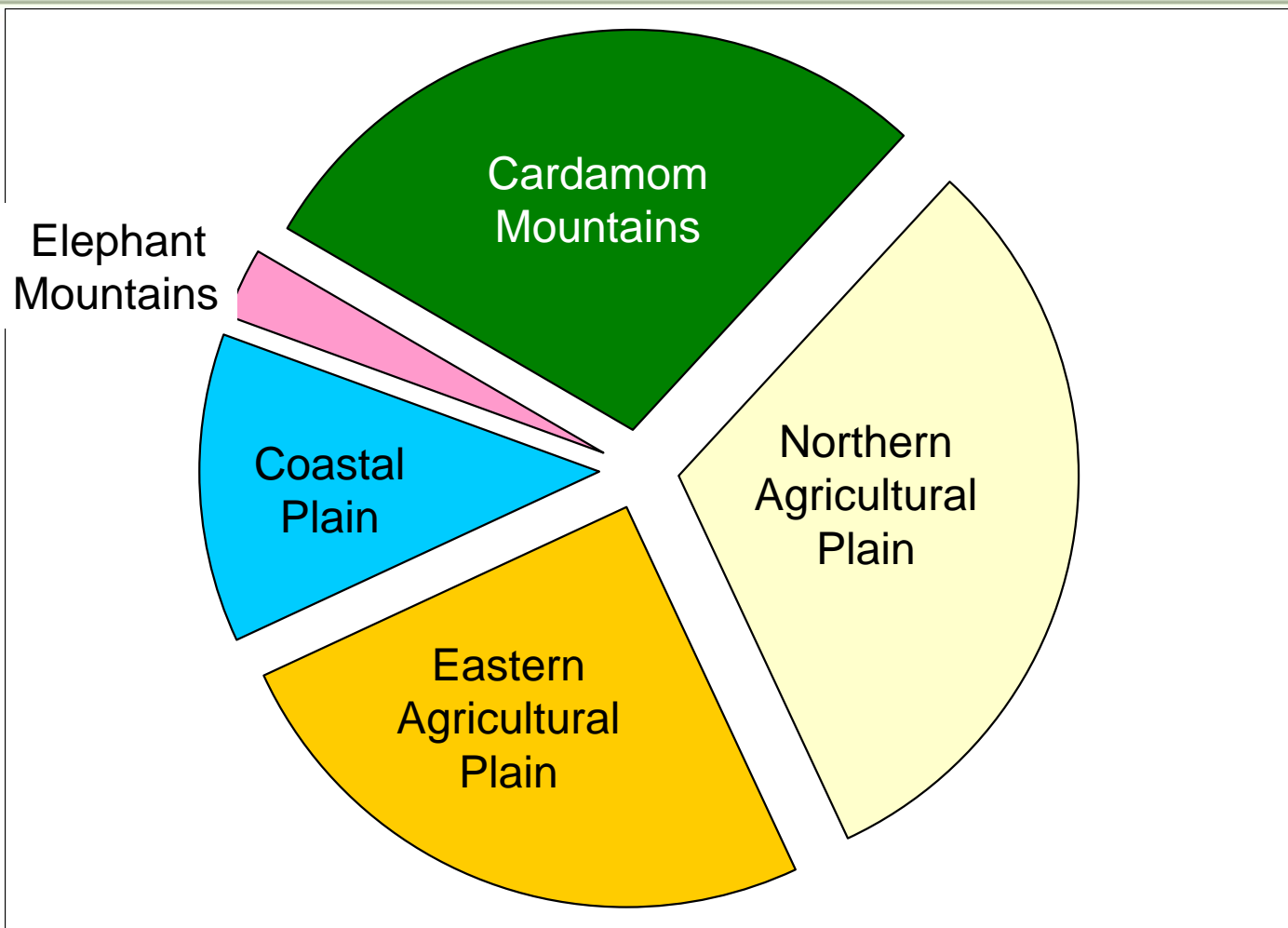
Six Landscape Types

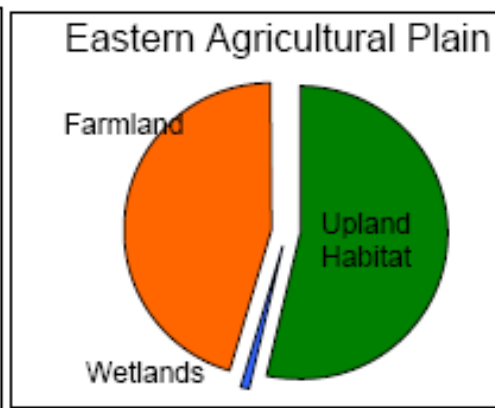
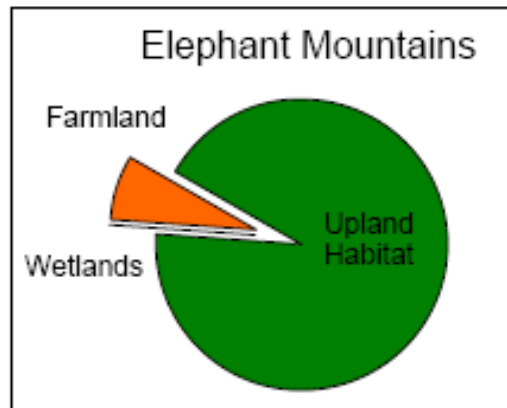
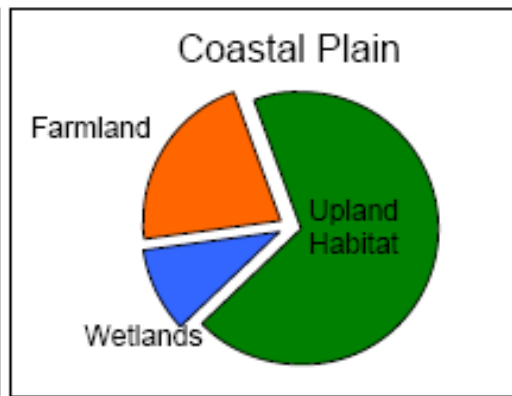
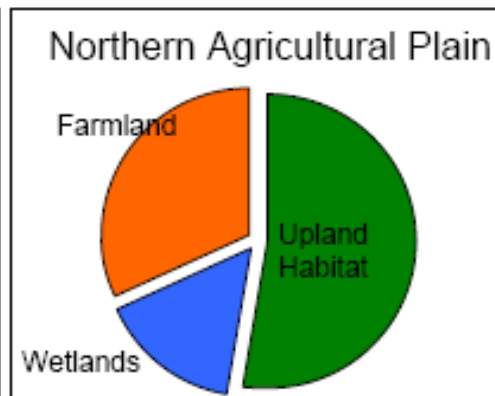
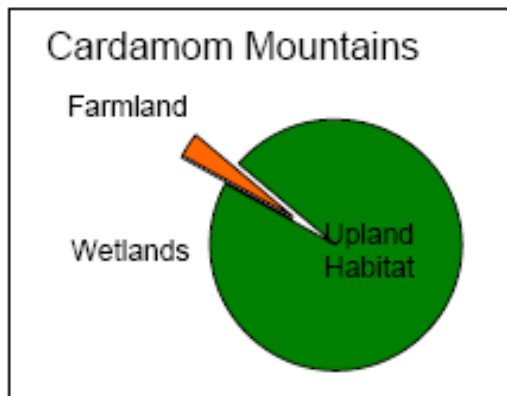


Protected Areas and Forest Reserves



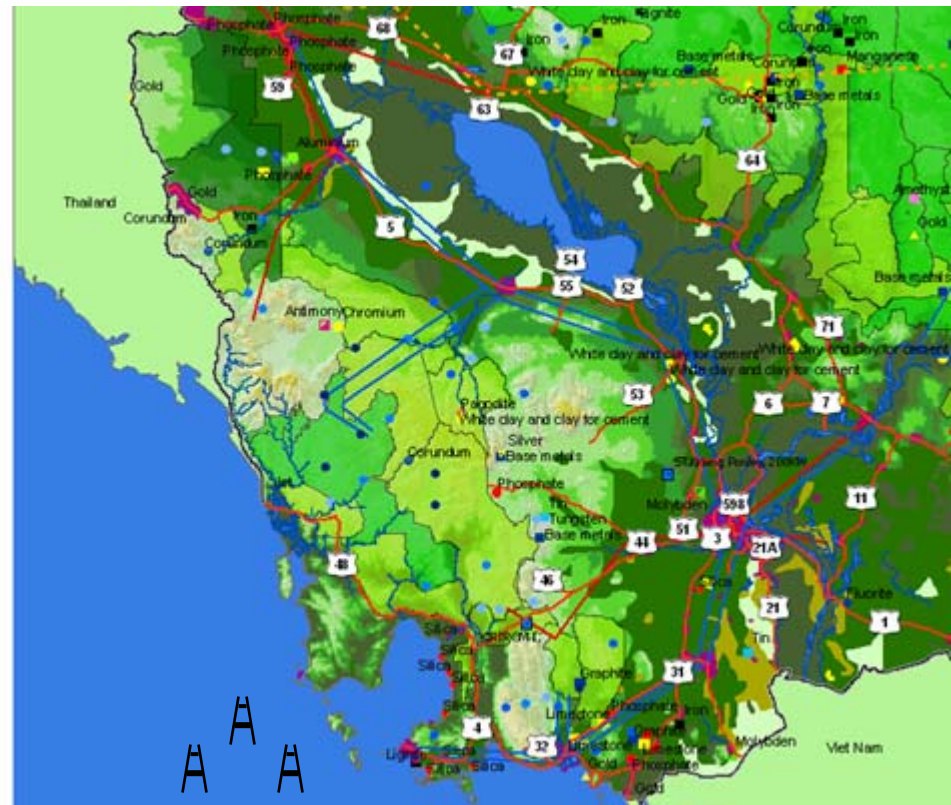
Land-cover and Land-use





Source: modified from WWF 97 vegetation map

- Road networks
- Hydroelectric energy
- Migration
- Demographic growth
- Plantation agriculture
- Biofuels
- Shrimp farms
- Mineral extraction
- Hydrocarbons
- Tourism
- Climate Change





small land holder



large land holder



Urban development
Koh Kong



Shrimp farms
Mangroves



Tungsten Mine



(Un-)Sustainable Forestry



Sugar cane to ethanol

Wheat to ethanol

Sugar beet to ethanol

Maize to ethanol

Rapeseed to diesel

Woody biomass to diesel

Tropical forest
to cropland

Tropical cropland
to forest

Temperate cropland
to forest

Temperate cropland
to grassland

Oil palm

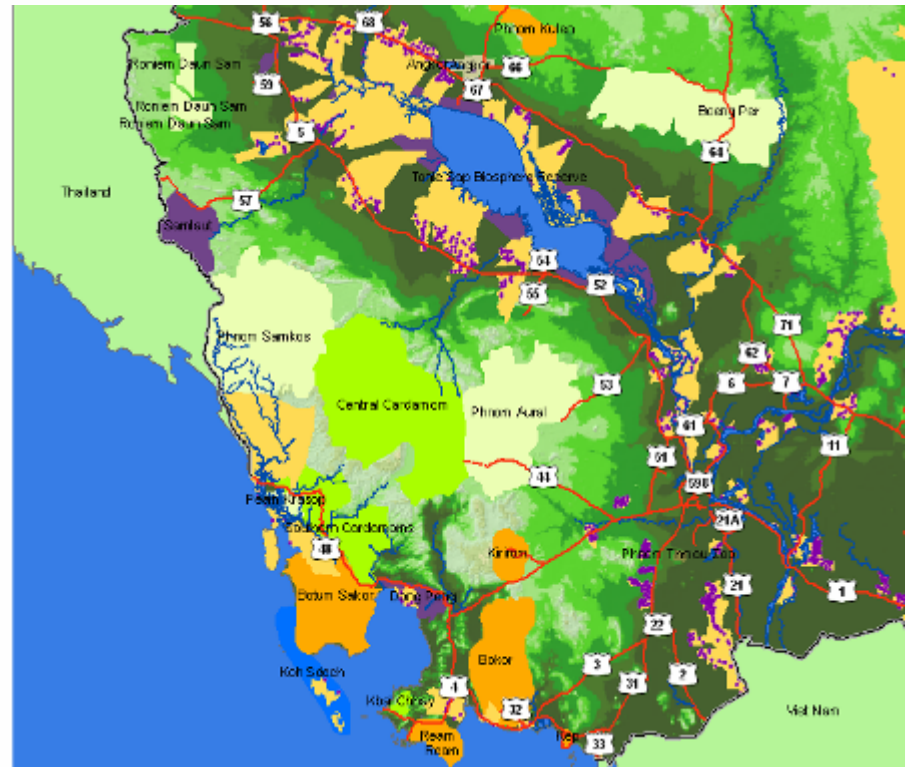
Sugar cane

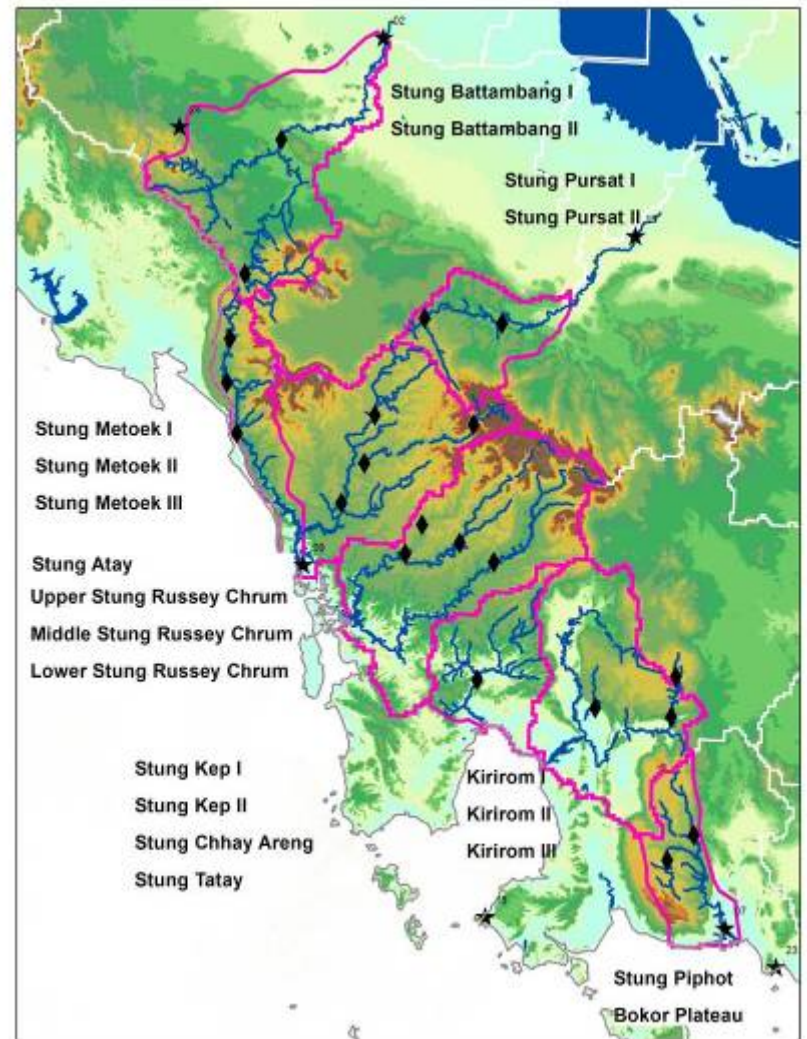
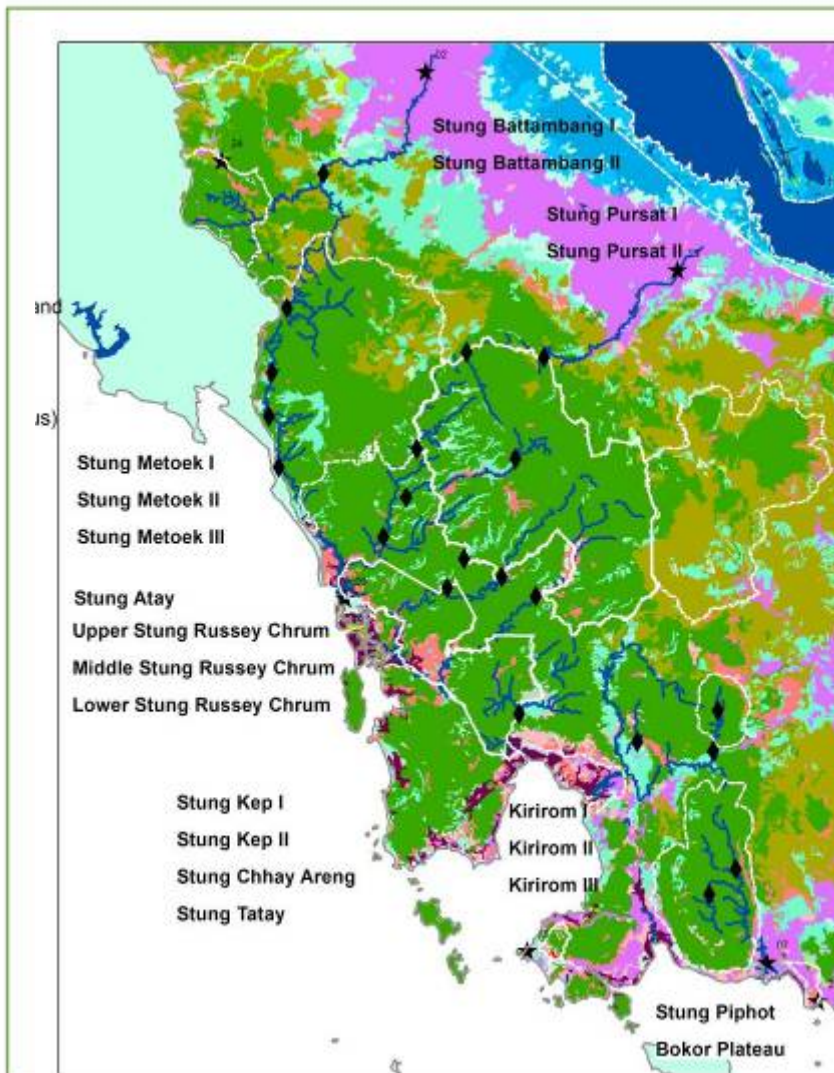
Jatropha curcas

Cellulosic alcohol

Carbon (metric tons/hectare)

- Watershed management
- Community engagement
- Tourism
- Forest management
- Decentralization
- Ecosystem services
- Climate Change





Cambodia



Angkor Wat

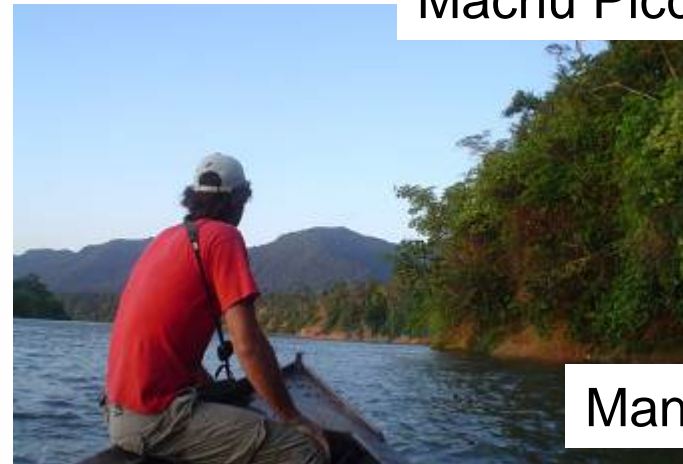


Cardamon Mountains

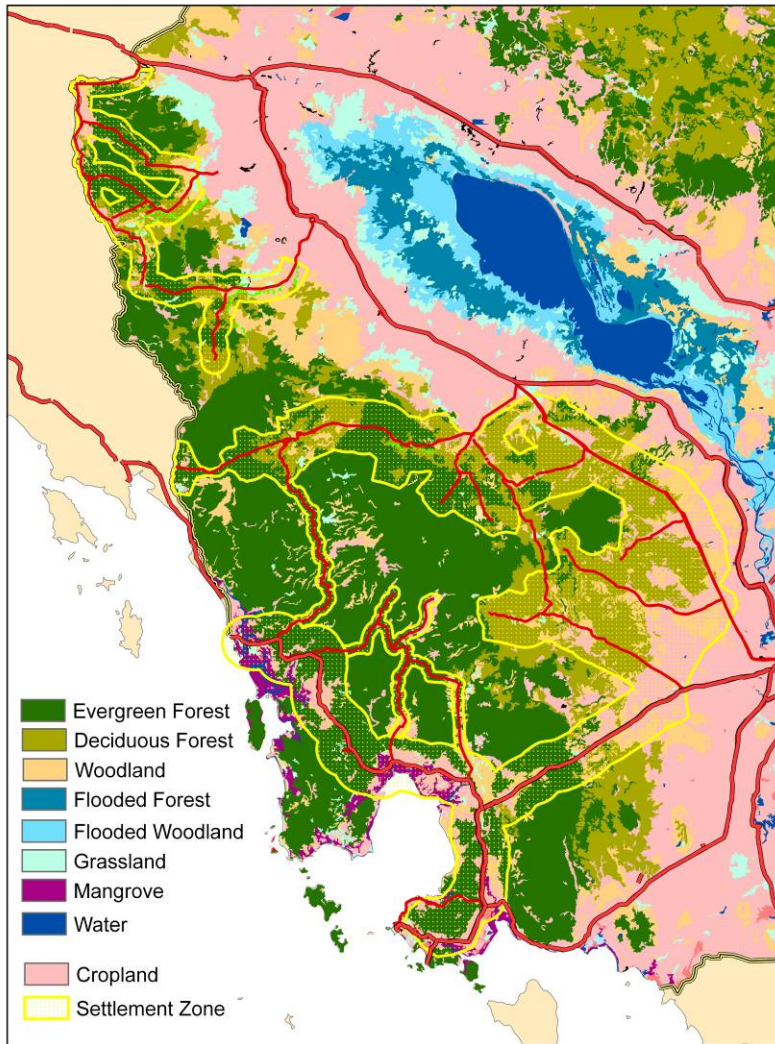
Peru



Machu Picchu



Manu



Access & Topography

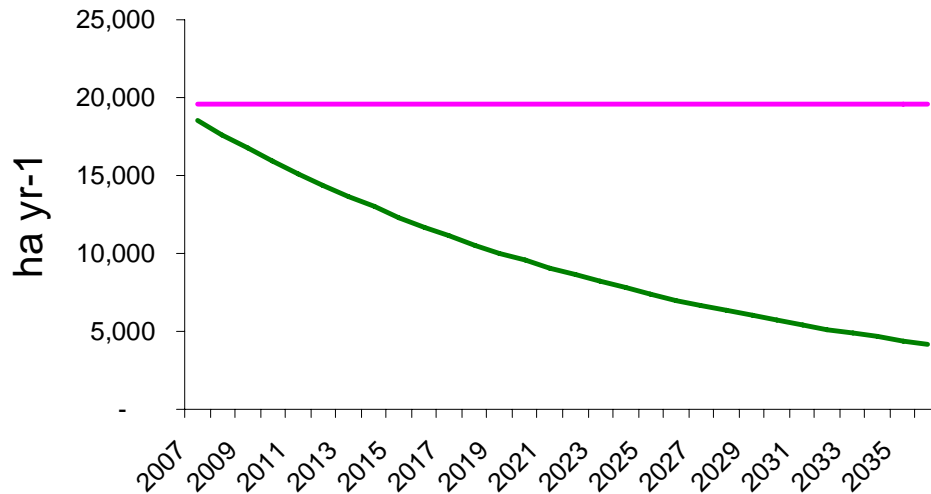
- Northern sector roads (5 km)
- Major roads (10 km)
- Existing settlement areas
- Logging roads in Cardamom Mountain (2 km)

Forest Cover (ha)

- | | |
|--------------------|---------|
| • Ran Forest | 490,000 |
| • Mixed Forest | 162,000 |
| • Deciduous Forest | 537,000 |
| • Woodland | 309,000 |

	Cover (1000 ha)	Carbon Stock (tC/ ha)	Carbon Pool (Mt)	CO2 eq (C x 2.33) (Mt)	Value @ \$10/t (\$M)
Rain Forest	489	100	49	114	1,140
Mixed Forest	163	75	12	28	284
Deciduous Forest	537	50	27	63	626
Woodland	309	25	8	18	180



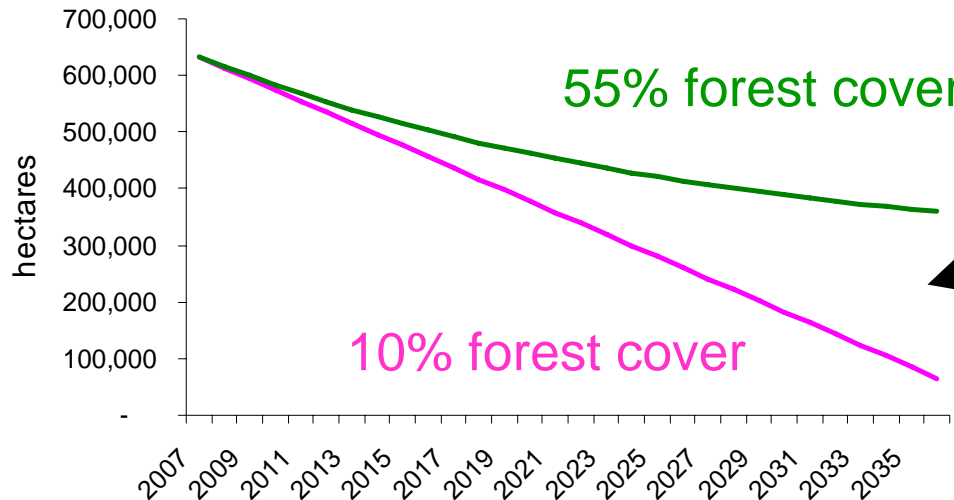


Business As Usual

- 19,5000 ha yr-1
- 3% of 650,000 ha

REDD Scenario

- 5% reduction in the annual rate of deforestation



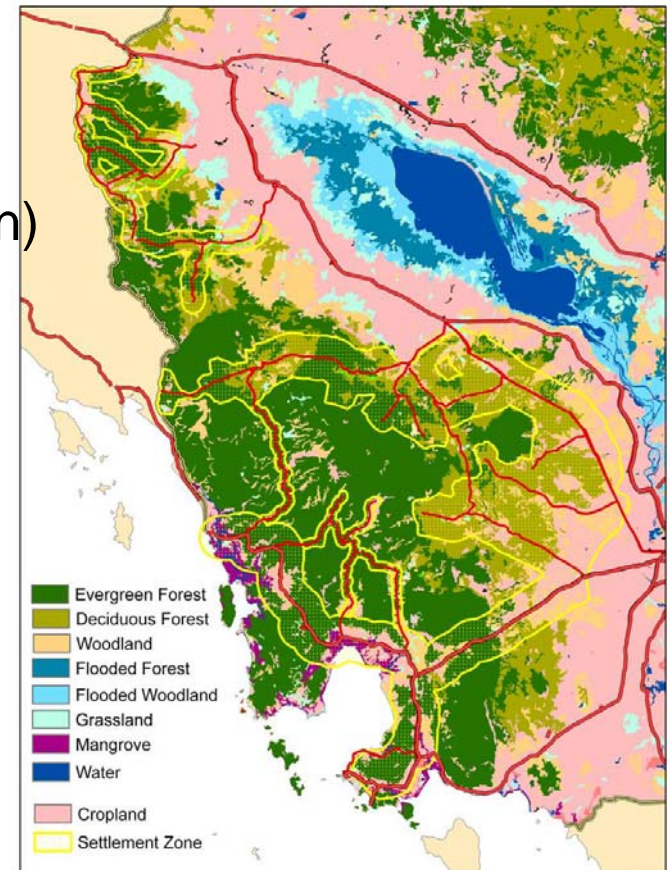
Reduced Emissions from Deforestation

Business as Usual Scenario

Annual CO₂ emission of 7.2 million tons
\$ 72 million (replacement cost @ \$10/ton)

REDD Scenario

- CO₂ emissions (tons)
 - YR1 = 269,000
 - YR2 = 794,000
 - YR3 = 1,562,000
- Annual Revenues (@\$5/MT)
 - YR1 = \$1M
 - YR10 = \$64 M (NPV ~\$27 M)
 - YR30 = \$405 M (NPV ~ \$19 M)



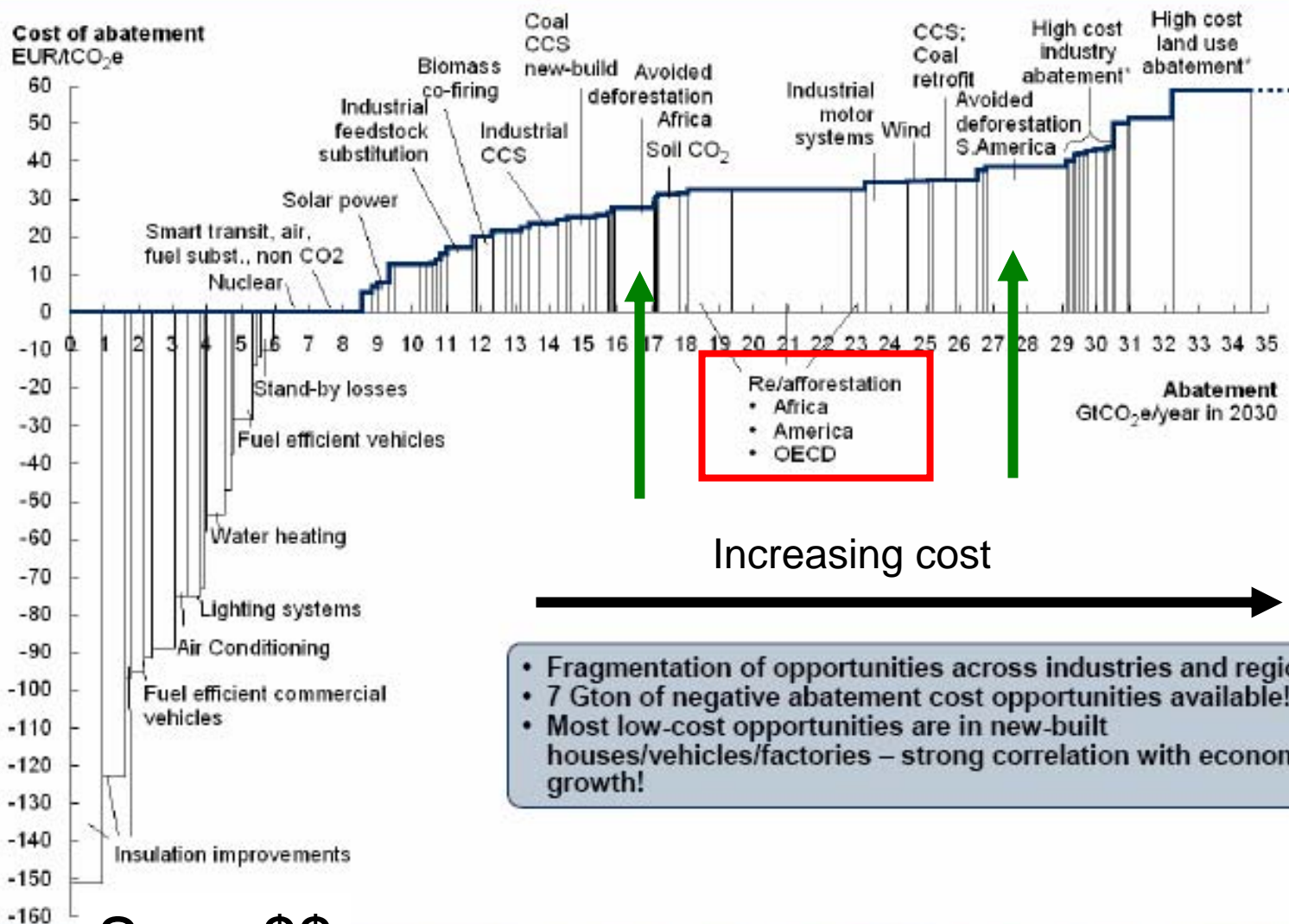
Total Avoided CO₂ emissions ~ 81 M tons
NPV of mean annual revenues ~ \$21 million

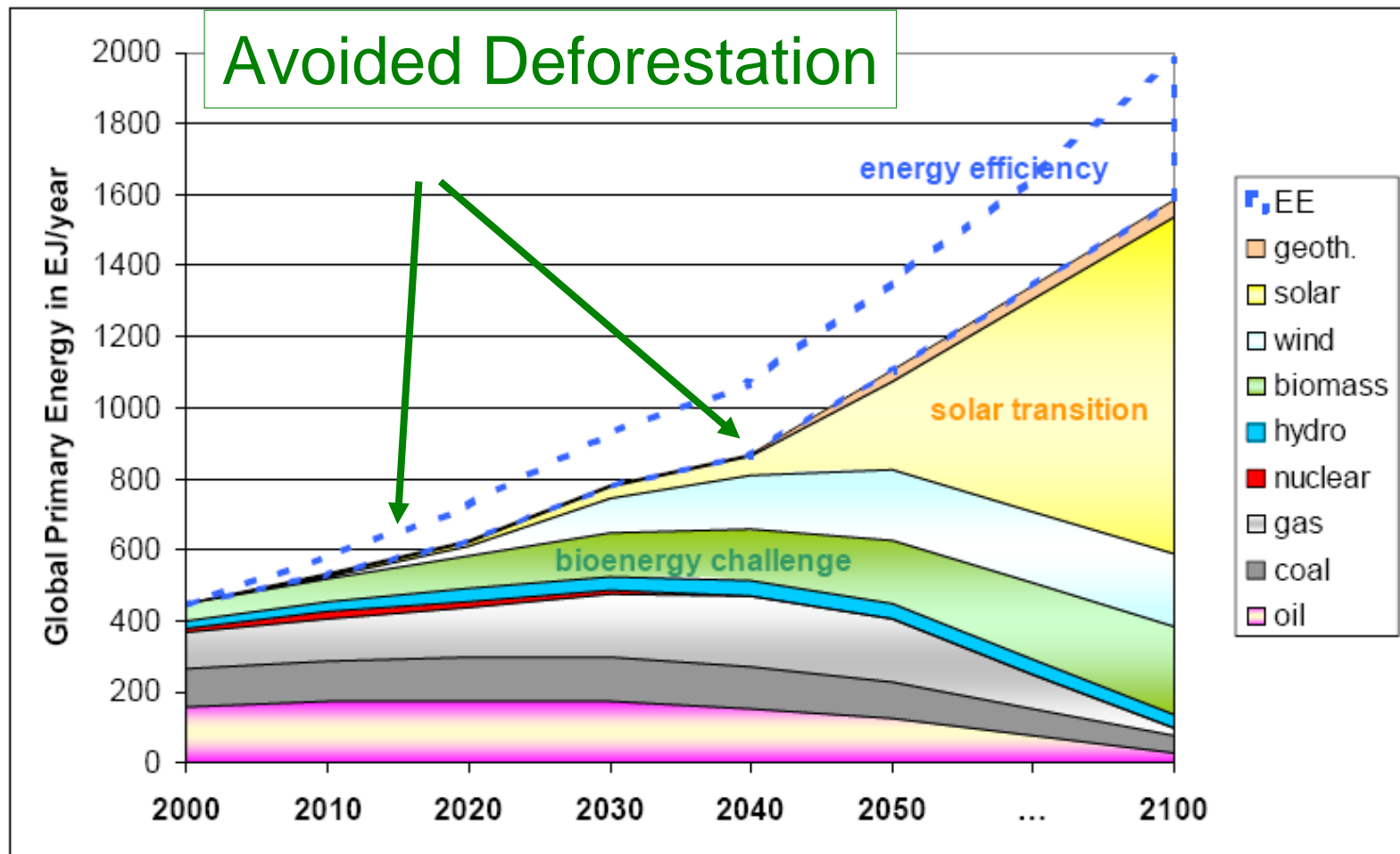
Reduced Emissions from Deforestation & Forest Degradation

- Deforestation represents ~20% of Global GHG Emissions
- Tropical deforestation shows no sign of abatement
- CDM/AR is a complete failure
- Cost effective compared to technological solutions & biofuels
- Buy time for until technological change is implemented
- Multiple other benefits



Global cost curve of greenhouse gas abatement opportunities in 2030 beyond the business as usual





Source: IEA (2007), IPCC (2007), UNPD (2004) and WBGU (2003)

Potential REDD Mechanisms

Overseas Development Assistance

Voluntary

Flexible

New GEF-like fund

Public

Cap and Trade

Market - Based

Historical Reference Period

Private – Public Partnerships

Certifiable

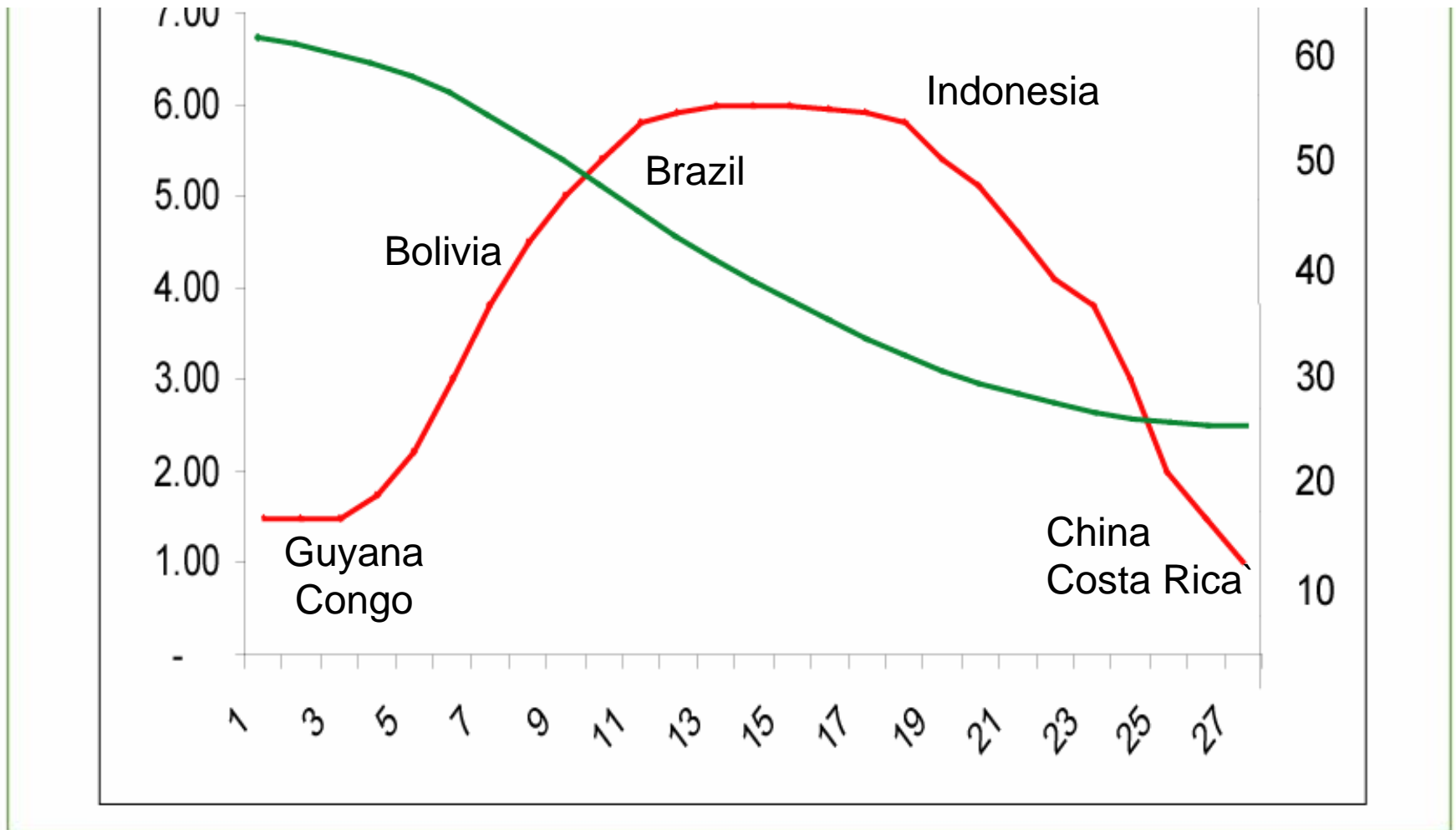
Total Carbon Budget

Deforestation – Reforestation



deforestation rate

remnant forest

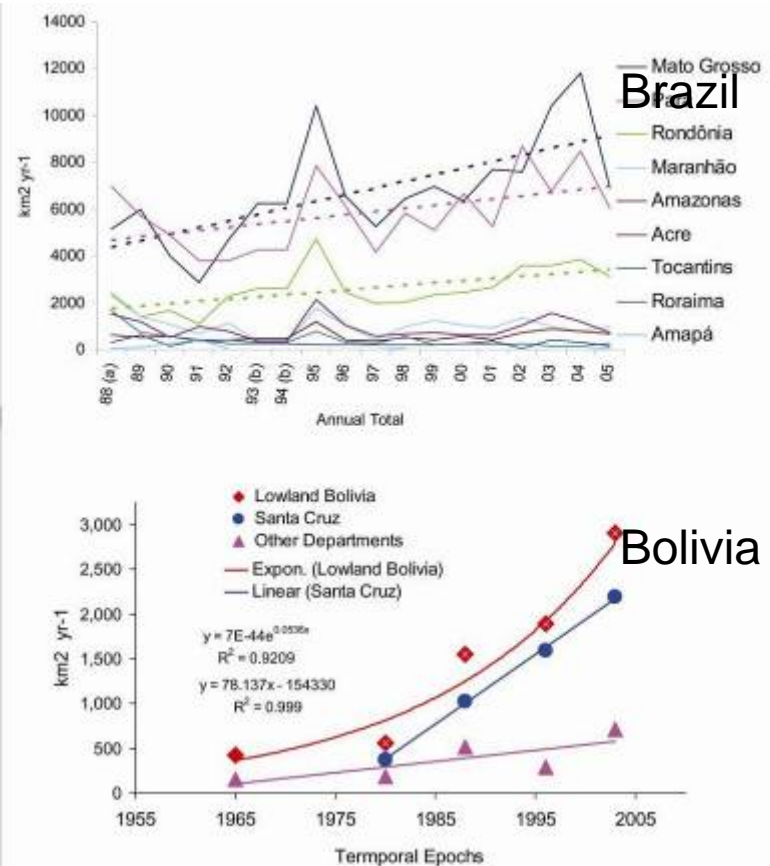


UNFCCC
COP-14
SBST (technical working groups)

Leakage – national scale
National base-lines
National certification
Local actions
Projects vs. subsidies

Brazil – historical base line
Bolivia - modeled base-line
Guyana – regional base-line

Cambodia ??



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CONSERVATION
INTERNATIONAL



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