International Institute for Applied Systems Analysis
IIASA www.iiasa.ac.at

science for global insight

The REDD+BECCS connection, assessing global potentials and sustainability -

Florian Kraxner, Sabine Fuss, and many more…

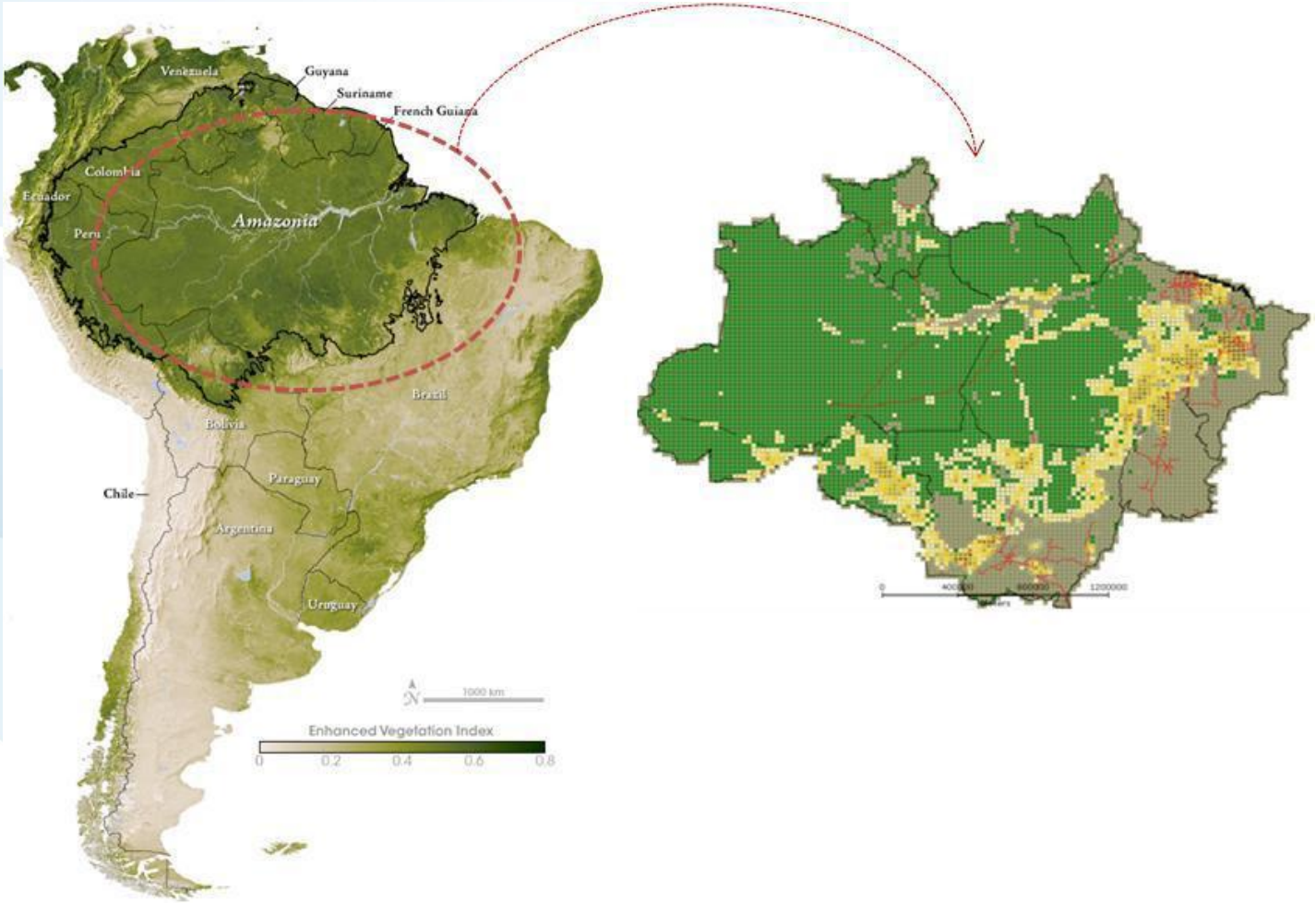
Ecosystems Services and Management Program, IIASA

Bio-energy and CCS (BECCS): Options for Brazil,
13-14 June 2013, Sao Paulo, Brazil

REDD pac

Why REDD/Avoided deforestation

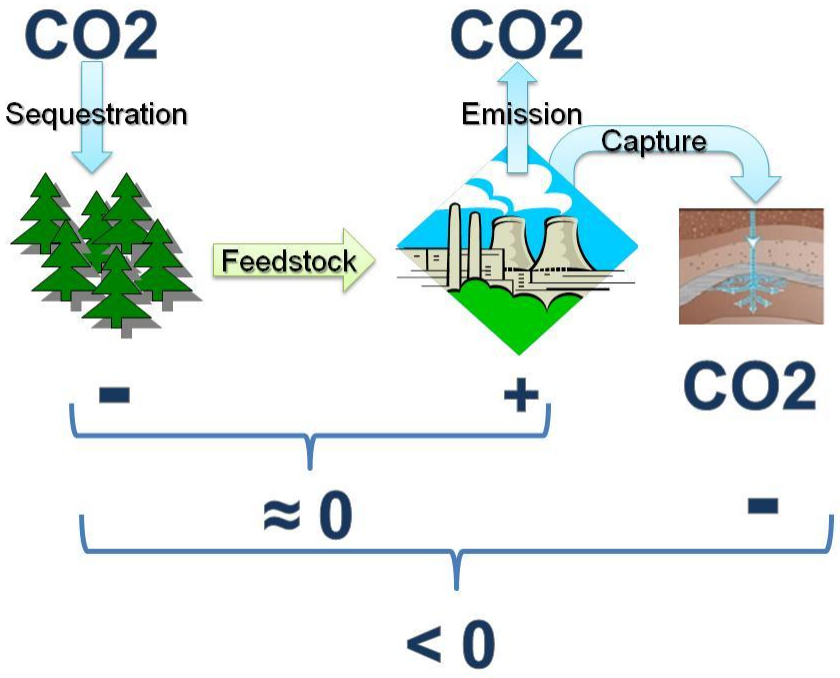
Land use dynamics in Mato Grosso



Source: Juliana Gil, INPE

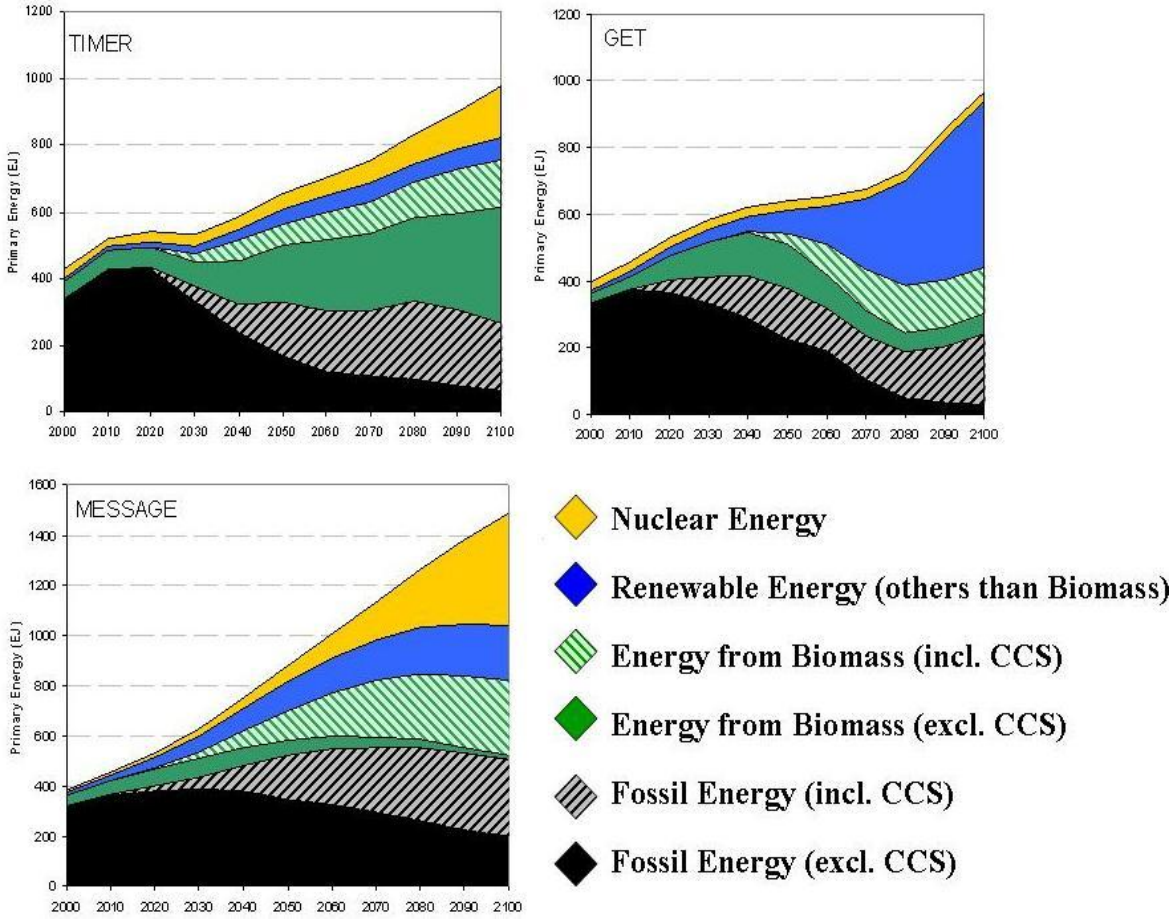
REDD+BECCS Connection

- REDD+ enhances carbon storage, but also unlocks potentials for credibly carbon-neutral bioenergy.
- Bioenergy + CCS = negative emissions
- Synergies between REDD+ and BECCS schemes generating co-benefits, e.g. for biodiversity conservation.



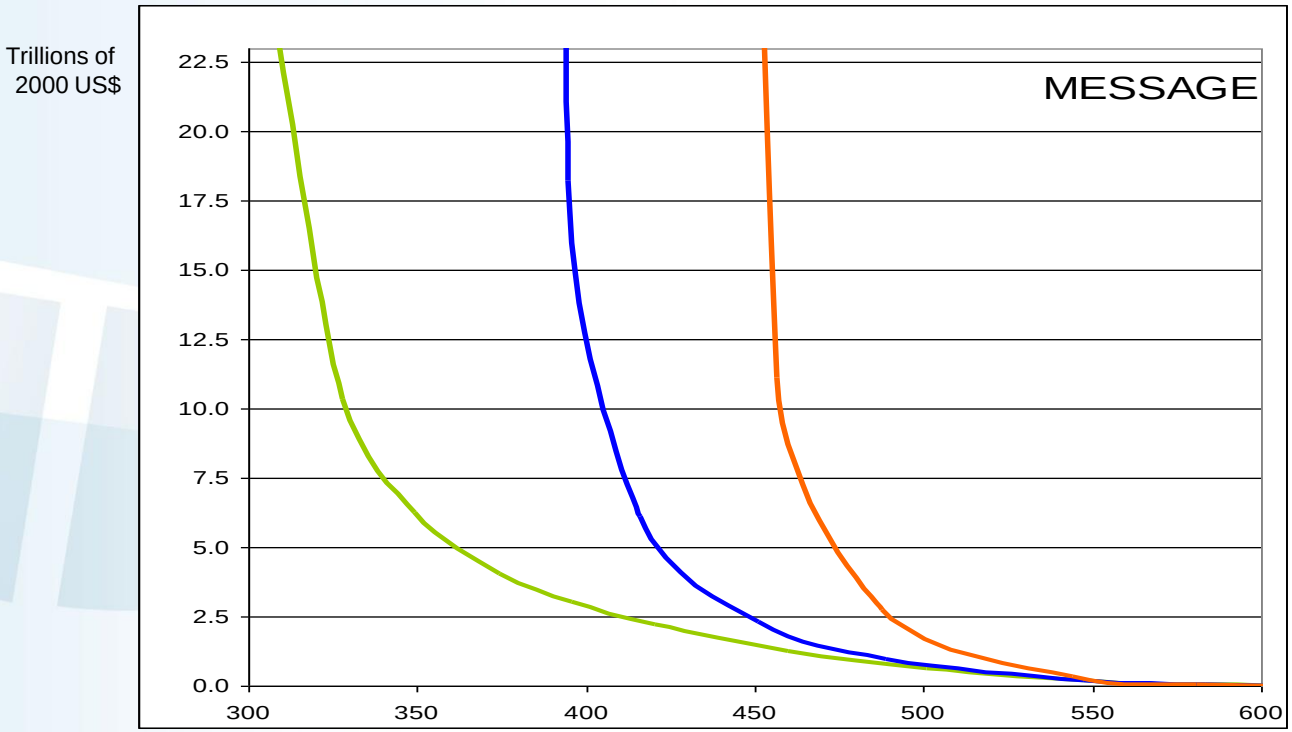
Status quo BECCS Research

- BECCS as a component of a wider mitigation strategy (energy scenarios)
- Technical aspects
- Policy context (NAMAs, emission trading, etc)
- No comprehensive assessment of potentials
- No embedding in wider socio-economic and biodiversity context.



Source: Adapted from Azar et al, 2010

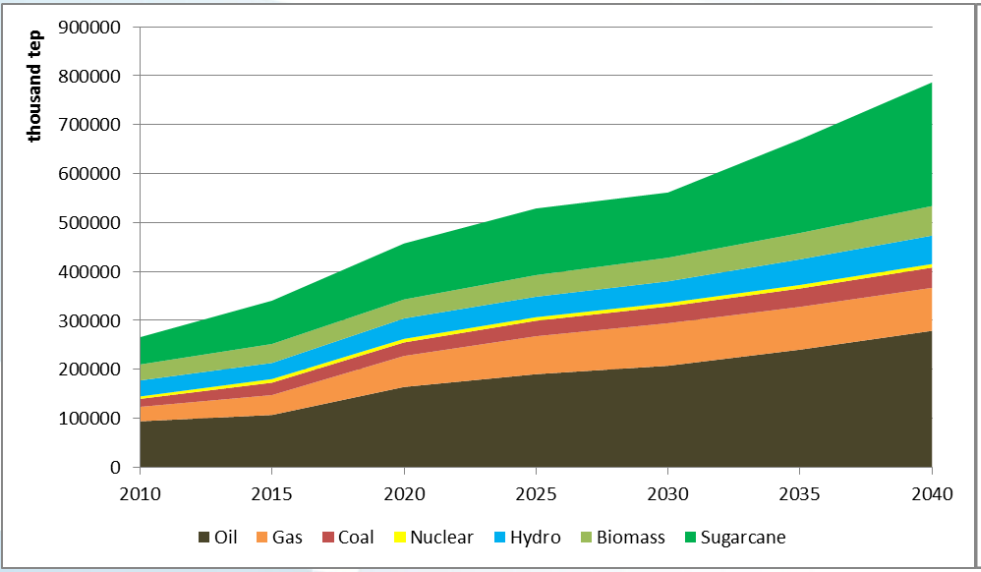
Net present value costs for atmospheric CO_2 stabilization by the year 2100

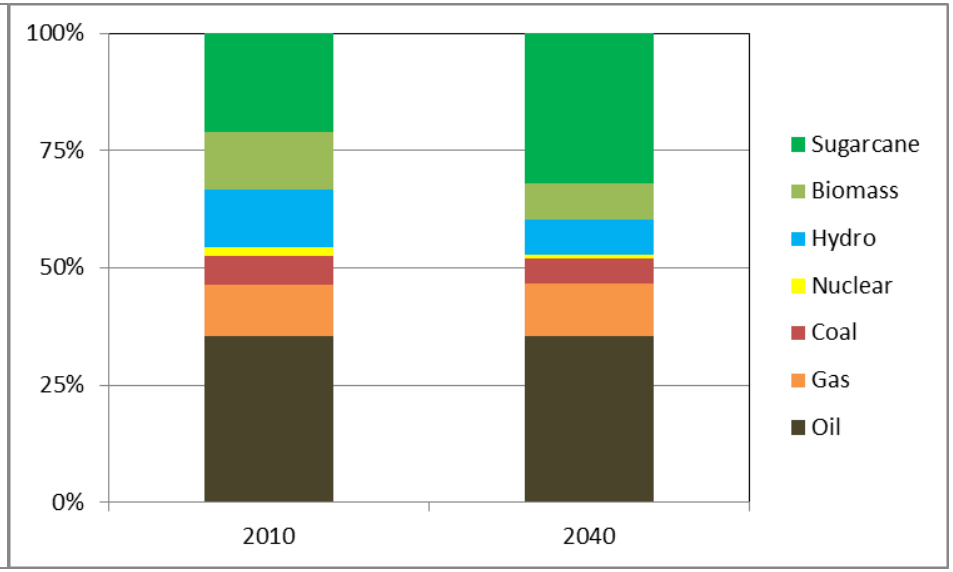


Green ~ BECCS is included
Blue ~ fossil CCS only
Red ~ no CCS

Source: Azar et al. 2007

- MESSAGE Brazil: energy mix sample results



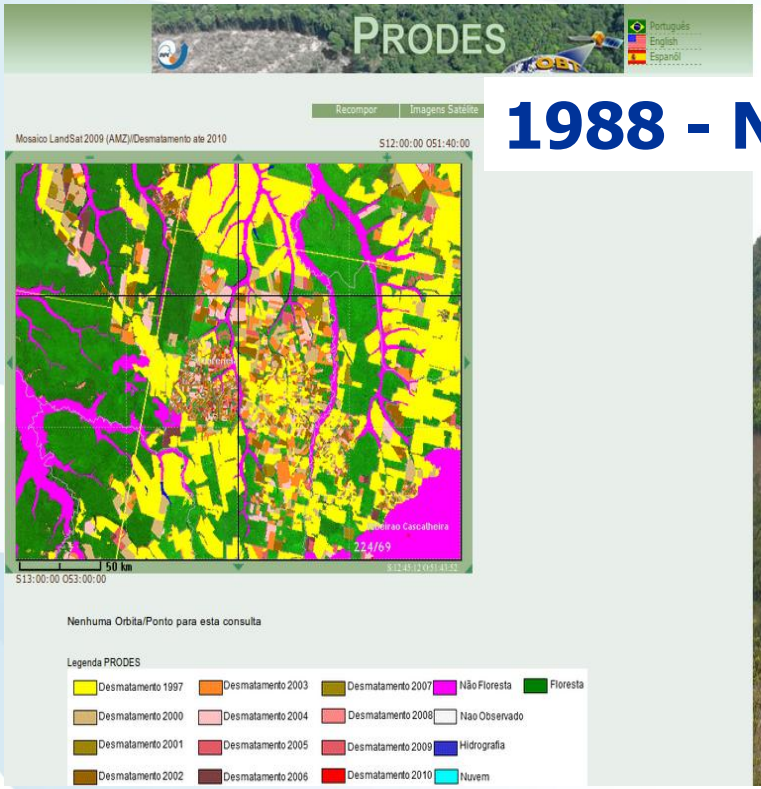


  - Importance of bioenergy: over 30% and increasing
  - Fossil fuel continues over 50%
  - Ethanol: 17% of transport sector (energy)

  - LULUCF must be accounted for

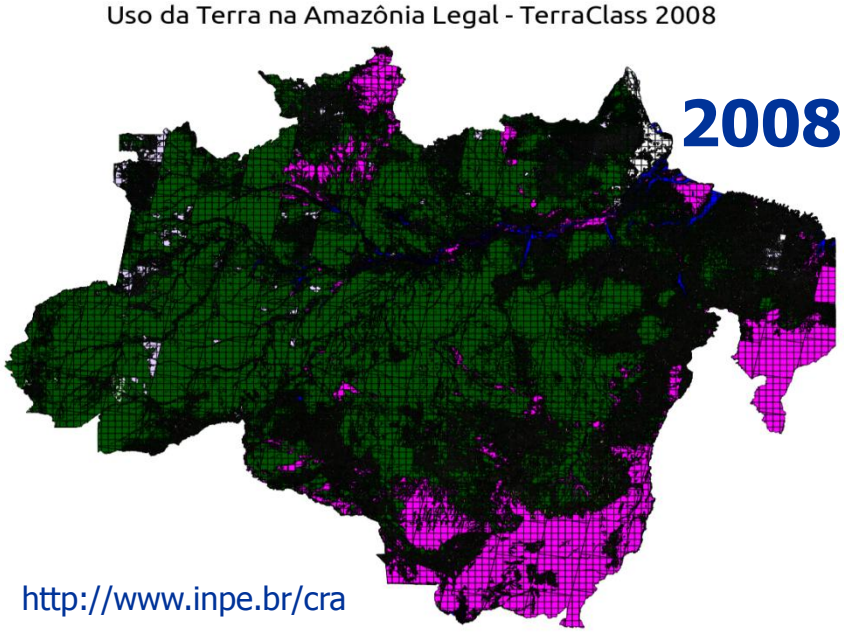
Source: Pedro Rua Rodriguez Rochedo, COPPE, URJ

Land Use/Cover Data
Brazil



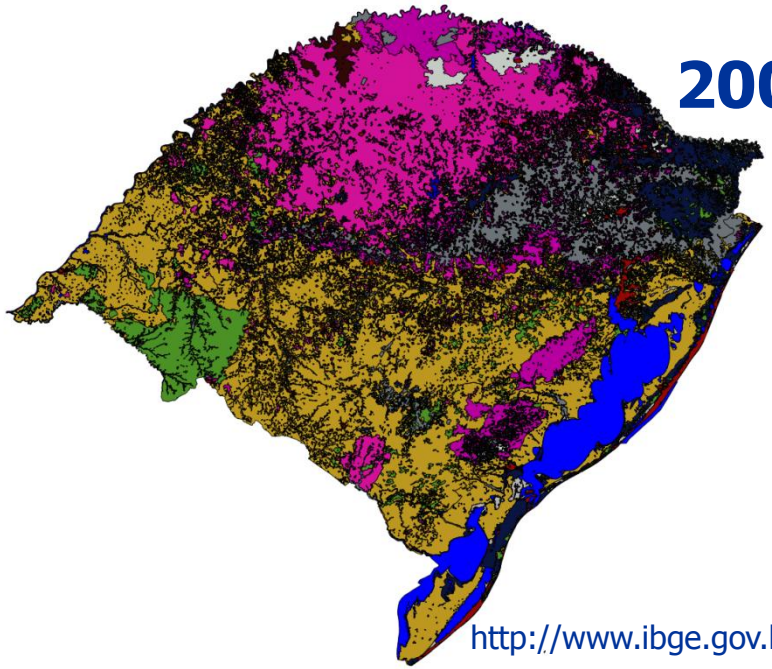
1988 - Now

http://www.dpi.inpe.br/prodesdigital



2008

http://www.inpe.br/cra



2009

http://www.ibge.gov.br

Land use/cover transitions?

REDD-PAC (**P**olicy **A**ssessment **C**enter) Who is doing what?

- Partner Institutions: IIASA (coordinator)
  UNEP-WCMC
  INPE/IPEA
  COMIFAC

- Duration: 4 years (Nov 2011-Nov 2015)

- Funding: German Ministry for the Environment (BMU)
  International Climate Initiative (ICI)

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

ICI

REDD pac

REDD-PAC - Why do we need it?

- REDD+ has the potential to deliver substantial multiple benefits
  - reductions in deforestation and forest degradation
  - increased forest conservation
  - sustainable management of forests
  - enhancement of forest carbon stocks

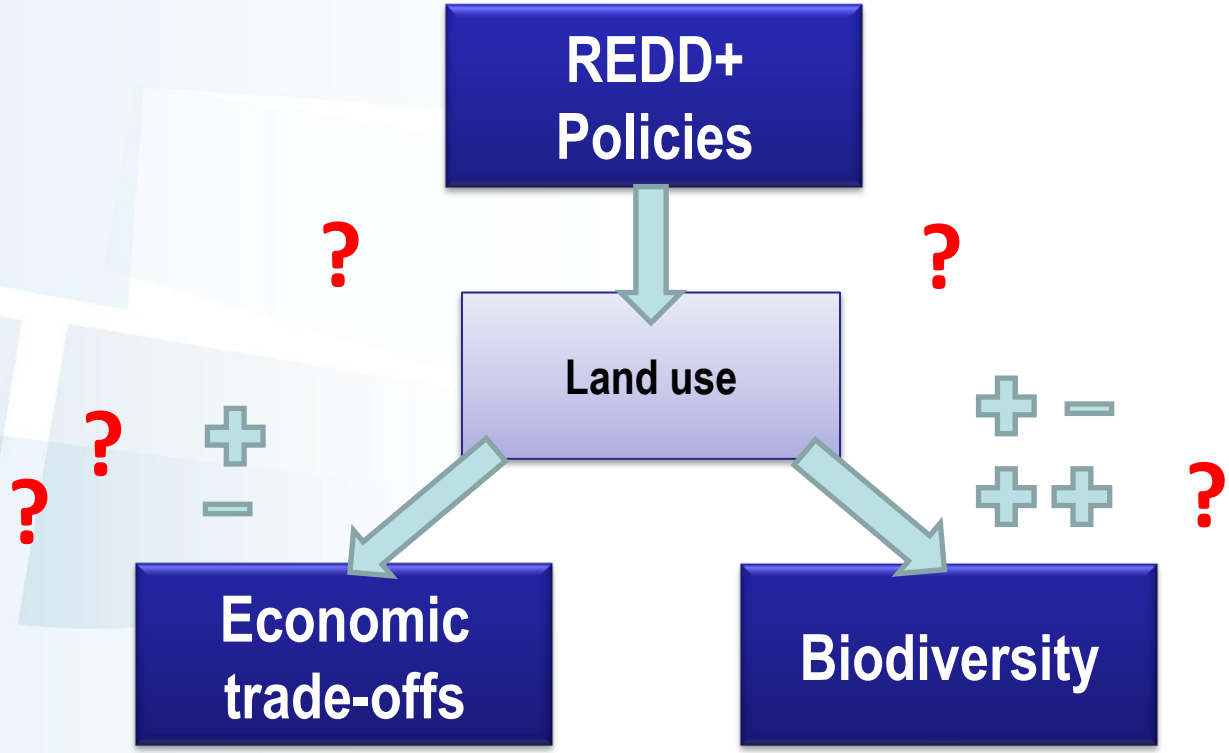
- Currently, there is a lack of technical know-how and capacity on issues that will ensure
  - efficiency, effectiveness and environmental integrity of the REDD+ mechanism
  - ranging from implementing reference level methodologies to basic planning for multiple benefits and the operationalization of safeguards

- There is a pressing need to support countries at different stages of their planning process for multiple benefits from REDD+. This includes
  - assisting countries in undertaking initial spatial analyses on multiple benefits and using the resulting products
  - assisting with the computation of high quality, globally consistent national reference scenarios
  - REDD+ policy impact assessments consistent with the safe-guards and wider sustainability principles negotiated under the UNFCCC and the Convention on Biological Diversity (CBD).

REDD-PAC - What will we do?

- Support 8 countries
  - Brazil, Democratic Republic of Congo, Vietnam, China, Uganda, Peru, Ecuador and the Philippines
    - capacity building on multiple benefits from REDD+
    - being responsive to national needs
    - focusing on spatial analysis
- This research project aims to help initiate
  - national REDD+ action planning in line with the objectives of the CBD
  - design and support a fair, efficient and effective international REDD+ architecture.
- Support
  - high resolution REDD+/CBD planning in the member countries of the Central African Forests Commission
  - focus on South – South learning between the DRC and Brazil.
  - integrated land-use modeling will support the design of globally consistent national and regional REDD+ policies that safeguard and enhance other ecosystem values, in particular those distinguished by the CBD.
- REDD-PAC will act as a global forum for sharing and improving global data on
  - forests and deforestation drivers
  - developing best practices for national REDD+ modeling.
  - thereby support bilateral and multilateral efforts to ensure transparency, as well as environmental and financial integrity, of REDD+ efforts.
- The project will have a broader impact by helping to generate national capacity for improved and integrated land use planning, design policies for the agriculture, forestry, nature conservation and bio-energy sectors in an economy-wide and globally consistent way.

REDD-PAC - How will we do?



GLOBIOM-Central Model in REDD-PAC

AGRICULTURE

Wheat
Rice
Maize
Soybean
Barley
Sorghum
Millet
Cotton
Dry beans
Rapeseed
Groundnut
Sugarcane
Potatoes
Cassava
Sunflower
Chickpeas
Oil Palm
Sweet potatoes

Buffalo
Cattle
Sheep
Goat
Pig
Poultry

↓

Beef
Lamb
Pork
Poultry
Eggs
Milk

FORESTRY

Biomass for log production
Fuel wood
Other wood

↓

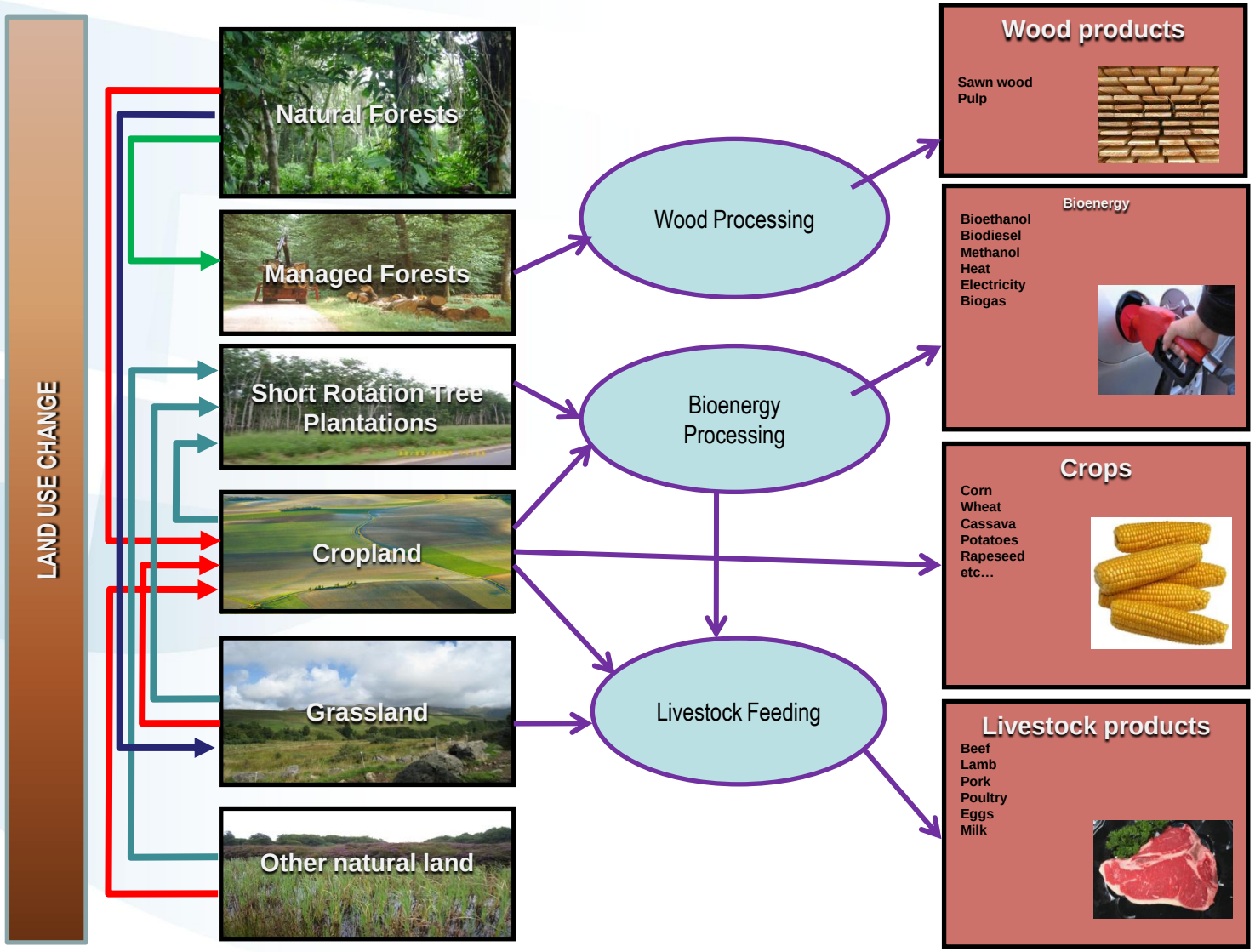
Pulp wood
Logs

BIOENERGY

Ethanol
FAME
Methanol
Heat
Electricity
Biogas

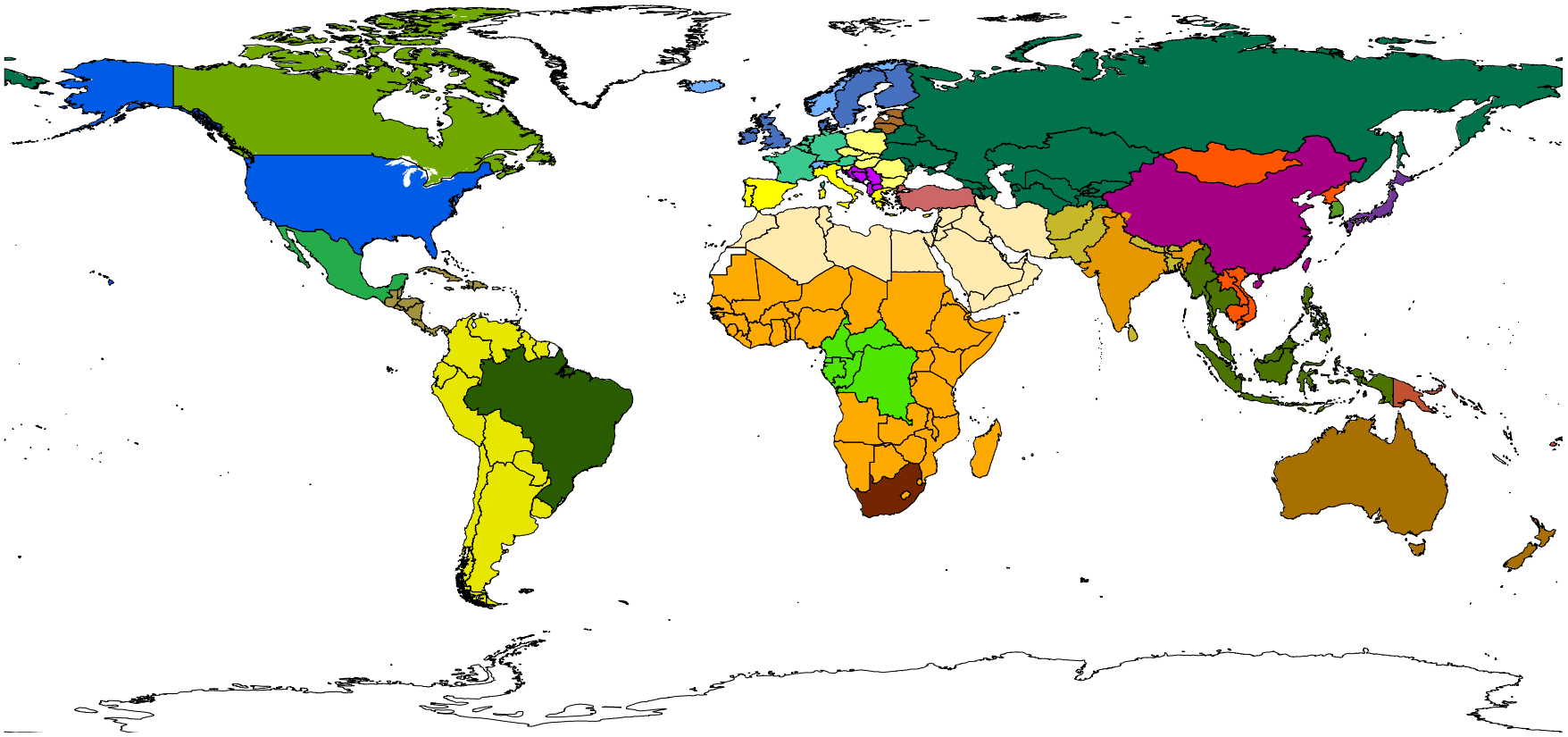
Source: Havlik et al. (2011). www.globiom.org

Land use modeling - process



Source: Havlik et al. (2011). www.globiom.org

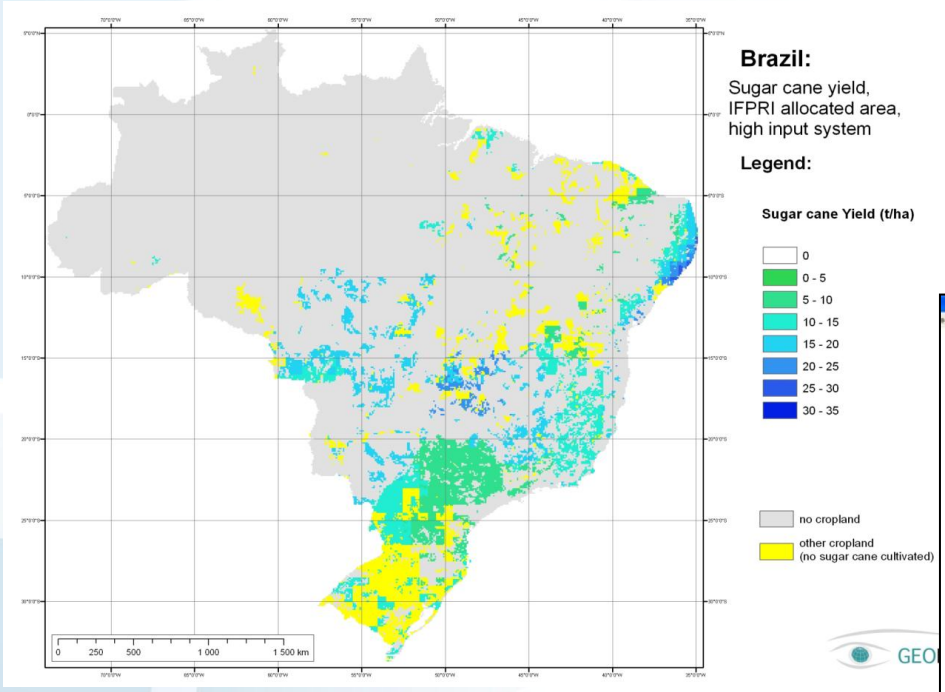
World split up in 30 sub-regions



30 regions represented on the map
+ Sub-saharan Africa split in Western Africa, Eastern Africa and Southern Africa
(Congo Basin and South Africa already separated)

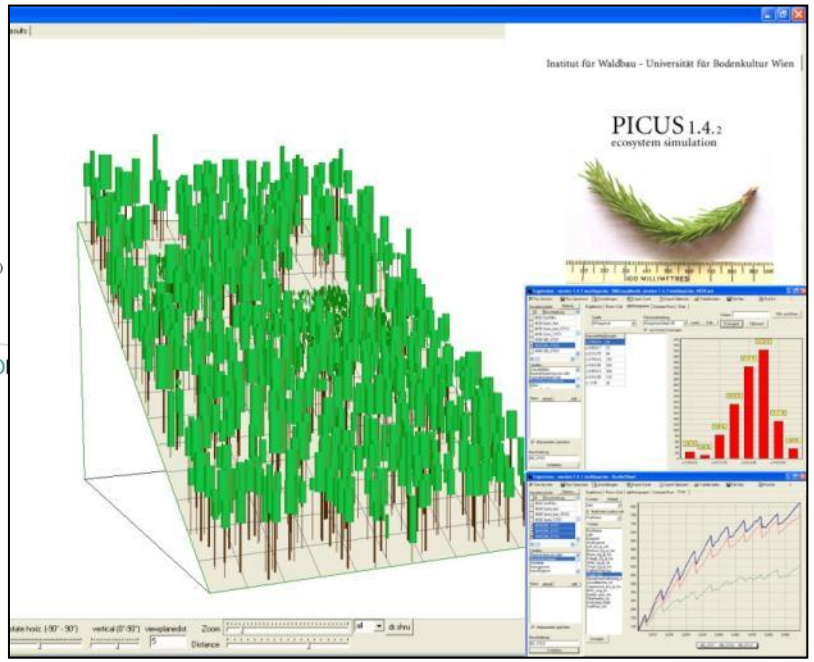
Source: Havlik et al. (2011). www.globiom.org

Geographic explicit input data



Agriculture Data from EPIC

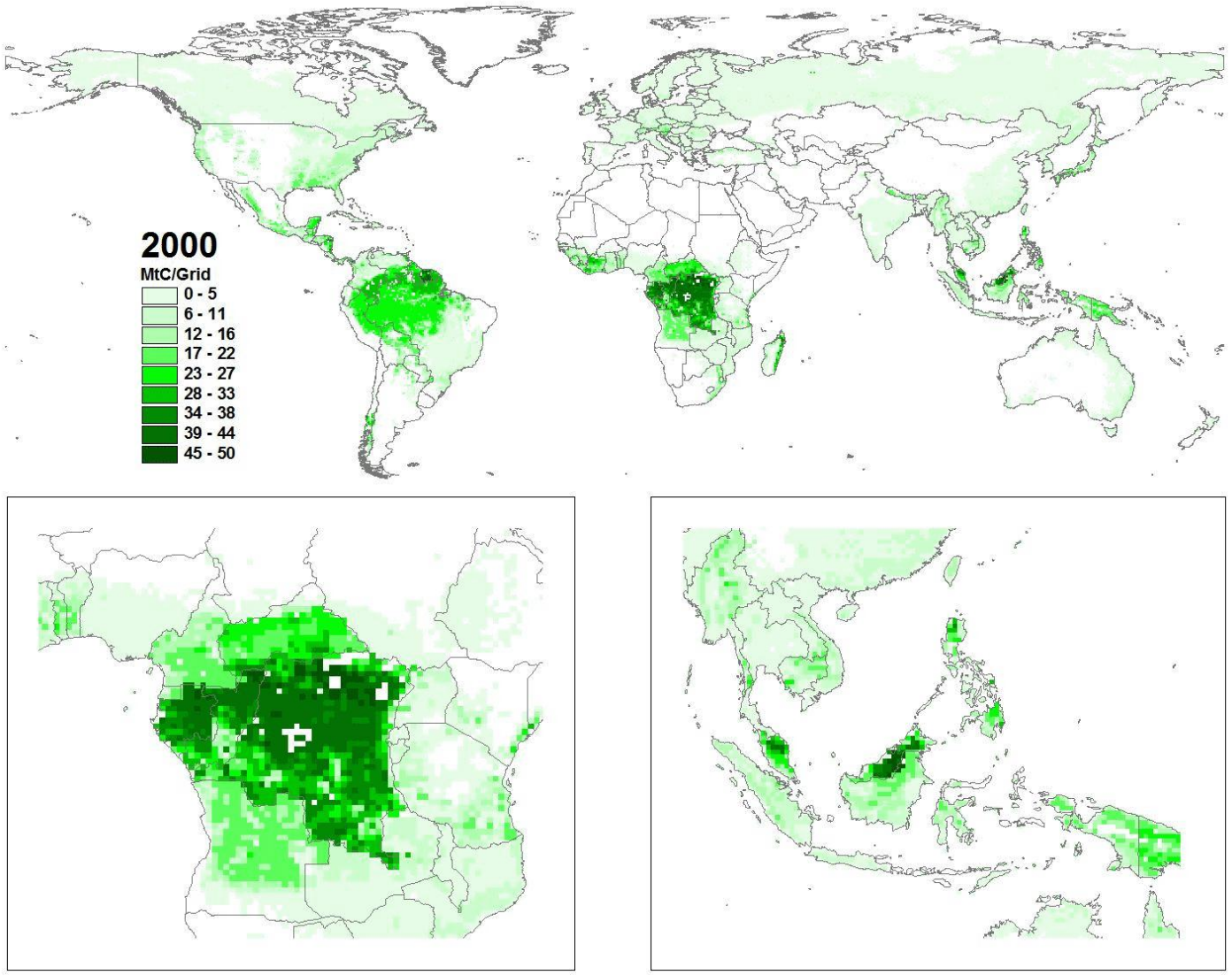
E.g. crop type, distribution and management



Forest parameters are taken from G4M

- Forest Carbon stock
- Annual harvestable wood
- Harvesting costs
- Afforestation
- Deforestation

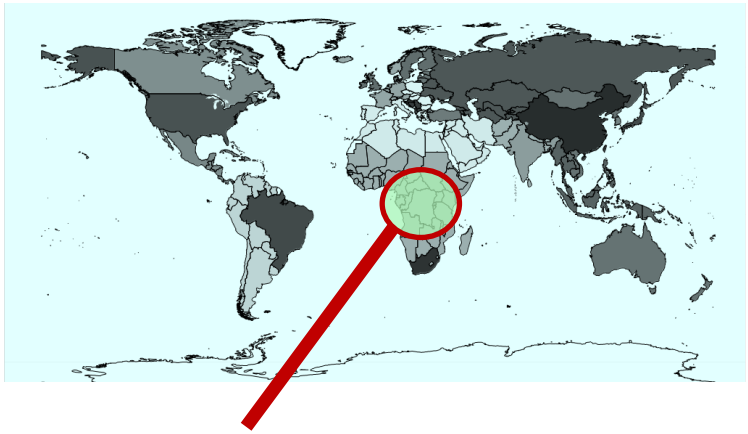
G4M: Spatially explicit information

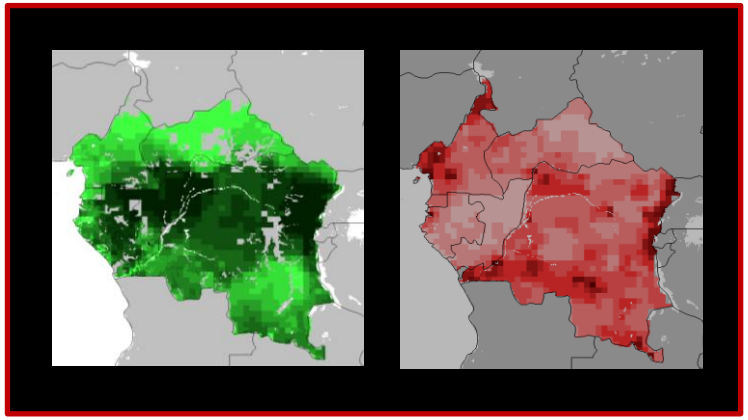


REDD in the Congo Basin

CONGOBIOM

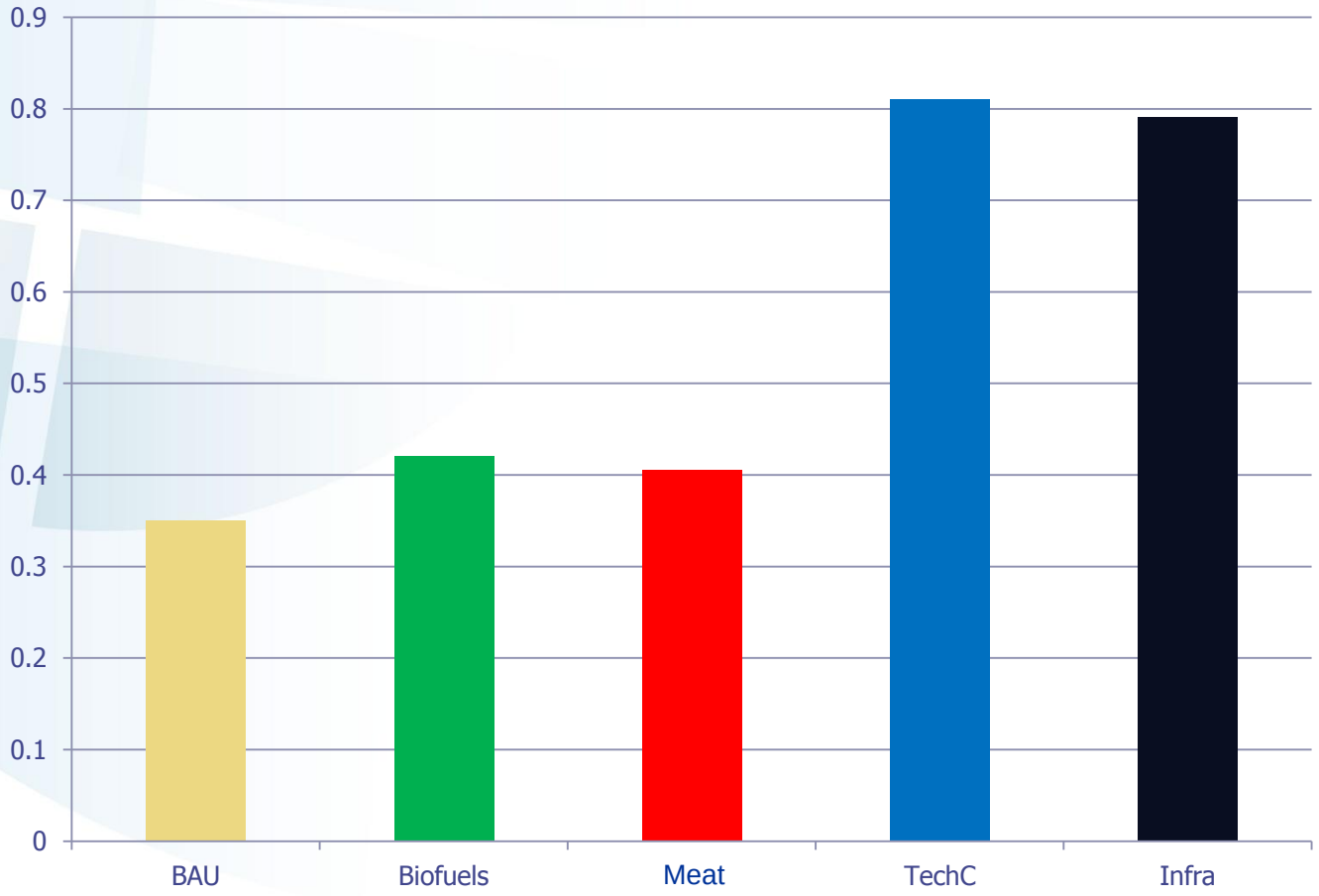
- 1550 simulation units
- Internal transportation costs
- Spatial representation of fuel wood demand
- Cocoa and coffee included
- Delineation of forest concessions and protected areas



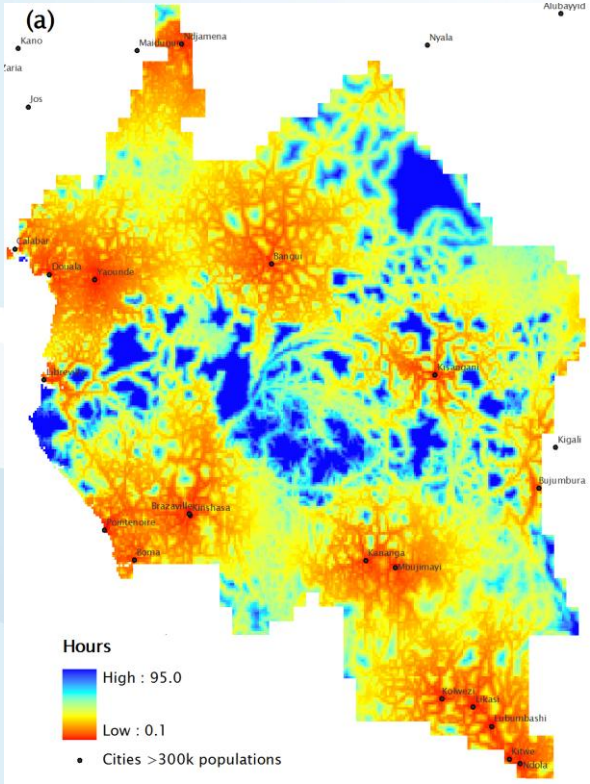


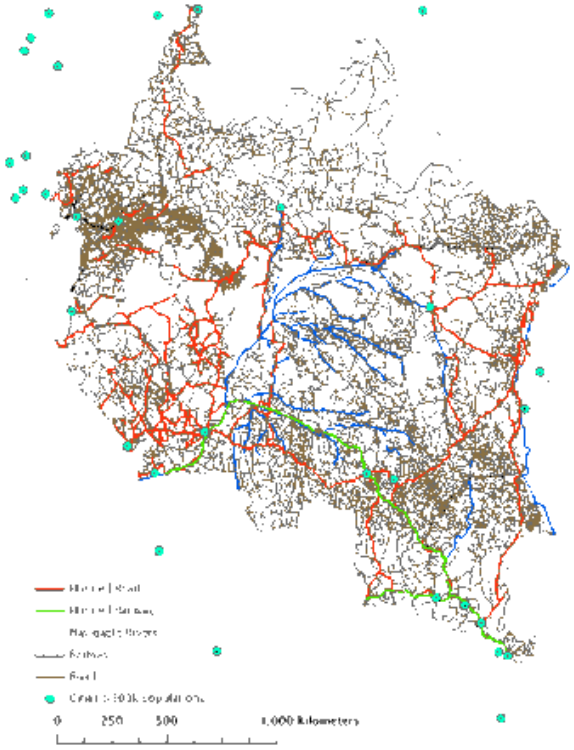
Deforestation Impact/Driver Analysis

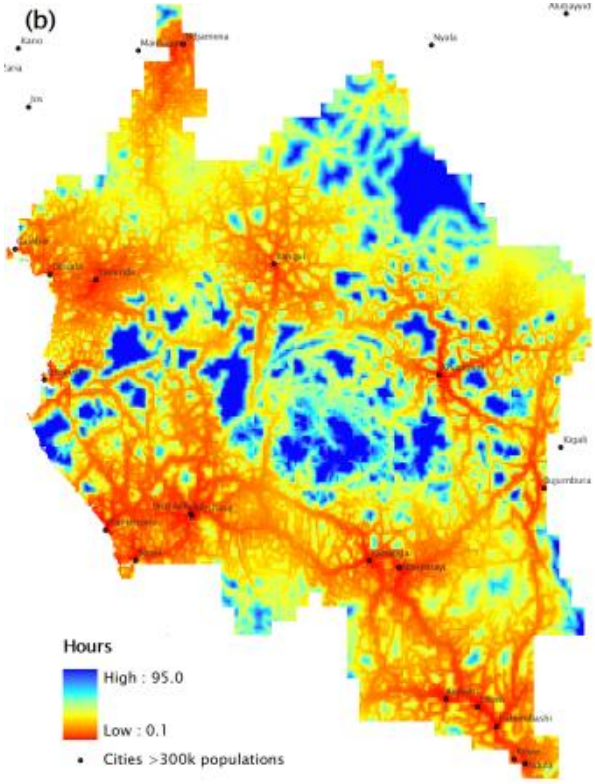
- Deforested area in Congo Basin in 2030 (Mio. Ha)



REDD in the Congo Basin







Transport time with existing infrastructures (Circa 2000)

Transport time with new infrastructures

***Source*: National Ministries, World Bank**

IN **INDONESIA**, **INTERNATIONAL RELATIONS**, **NEWS**, **NORWAY** / BY **SIPPACHAI KUNNUWONG** / ON JANUARY 7, 2013 AT 10:04 /

Deputy Head of Mission Marianne Damhaug explaining Norway's position on CCS. Photo: Norwegian Embassy

The Norwegian Embassy in Indonesia on Dec 13 opened a seminar arranged by CCOP, ITB, Geological Agency and Petrad in Bandung.

Opportunities

- REDD+ and BECCS share similarities in the incentivisation challenges and co-benefits
- Co-benefits include:
  - Rural development (vis-à-vis focus on biofuels from palm oil plantations)
  - Conservation of biodiversity (combination of REDD with sustainably managed secondary forests)
  - Knock-on effects for rural livelihoods (e.g. based on tourism), preservation of natural heritage, reduction in fossil fuel dependence

Questions and Contact

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