Delusional REDD baselines

Britaldo Silveira Soares Filho
Main concepts

- **Additionality**: Proof that reduction in emissions from REDD is additional to reductions that would occur if initiative were not in place.

- **Leakage**: reduction in carbon emissions in one area that results in increased emissions in another

- **Permanence**: long-term reduced emissions from REDD. Depends on vulnerability to deforestation and/or degradation.

*Concepts and methods borrowed from CDM projects*
Measuring performance: the baseline approach

The CDM baseline

**Historical approach:** introducing an innovative process to an installed industrial plant.

**Forward-looking approach (ex ante):** the building of a new factory with a carbon neutral approach.

*Depend strongly on the project and less on the context (Lesser risk of hot air).*
**REDD baselines**

**Historical approach:** Brazil’s National Climate Change Plan.

**Forward-looking approach:** Brazil overall GHG target of 39% reduction by 2020 (emissions from agriculture can increase from 480 to 627 MCO₂)

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### Graph Details:

- **Historical**
  - 2000: 18226 km²
  - 2020: 27772 km²

- **Reduction**
  - 2000: 19014 km²
  - 2020: 6238 km²

- **Baseline**
  - 2000: 15405 km²
  - 2020: 8935 km²

- **REDD**
  - 2000: 14196 km²
  - 2020: 3805 km²
What to do with countries or regions with low deforestation rates and large extent of forests

For more information: visit [www.csr.ufmg.br/map](http://www.csr.ufmg.br/map)
Forward-looking baseline

Additionality = $$ credits
Baseline is not solely based on the project itself, but on a reference region. Therefore, there is a need to understand the effect of the project on the deforestation regional trend.
Solution: Deforestation model??

BASIC STEPS OF MODELING

1. understanding historical trends
2. identifying drivers of deforestation
3. modeling future scenarios

A series of what if decisions !!
Understanding historical trends

Modeling approaches for BAU baselines

Which one?

- Historical fixed rates
- Historical trend
- Business-as-usual simulation (future scenarios)
Modeling deforestation trajectories

Soares-Filho et al. 2010. PNAS.
Modeling scenarios

The End of Deforestation in the Brazilian Amazon


Trajectories can change drastically
Other aspects

- Delimiting the geographic reference region.
Other aspects

• Delimiting the geographic reference region.
Other aspects

• What if there are other projects???

Madre de Dios, Peru, have 12 or more REDD projects
identifying drivers of deforestation

They are in fact spatial determinants

Most models only incorporate spatial determinants!!!
modeling future scenarios

- Spatially-explicit model of deforestation to quantify where deforestation is likely to occur.

Deforestation is not random but occurs at locations that have a combination of bio-geophysical and economic attributes that are more attractive to the agents of deforestation.

True or false?
Stochastic nature of deforestation

Absolute frequency of transition probabilities of observed deforestation

Performance x realism

Increasing spatial performance decreases realism

Half true, half false

Dinamica EGO simulates landscape structure

Deforestation 1997-2000

Simulated 1997-2000

225/65

Protected area

Two patch sizes
Model validation

Validation only regarding location, but not spatial structure

Britaldo, Silveira, Soares, Filho
Model performance assessment

- Map comparison methods (how to lie with validation methods)

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Soares-Filho et al. in review

And model comparisons are quite subjective (e.g. Vega et al. 2011)
Different models have different assumptions, geographic scales, spatial resolutions, scopes, and, therefore, purposes.

Soares-Filho et al. (2006)

Both simulations developed using Dinamica EGO, but none of them were designed to fix baselines.
This means trouble

Simamazonia I business-as-usual (BAU) scenario of simulated deforestation for the Suruí Territory from 2010 to 2050.

Chief Almir Suruí
What about leakage?

In-out, out-out, diffuse (Fearnside, 2009)

Leakage cannot be simulated, but can be evaluated.

See Soares-Filho et al. PNAS. 2010
Good job & Business

But!!!!

No ready solution for REDD (although vendors say so)

There is no magic solution, via software wizard...

MODEL must be built from the ground to incorporate local knowledge...
In sum

• Although various MRV methodologies for mapping carbon stocks and modeling reductions as well as standards for international certification have been developed, the criteria for establishing baselines for crediting purposes are unsound; they do not take into account that forward-looking baselines are questionable because deforestation trajectories can alter drastically in response to changes in a complex set of circumstances (Nunes et al. 2012; Soares-Filho et al. IADB report, 2012).

• Furthermore, it is very difficult to isolate the local effect of a project from the overall trajectory of deforestation as well as to assess leakage arising from the establishment of projects, and none of those projects have attempted to perform such analyses (Soares-Filho et al. IADB report, 2012).

• As more specific standards and indicators are established, more flawed they become, because they are unfounded anyway (Personal Perception). And for financial crediting, every dollar counts. In addition, conflict of interest might lead to gamming (Fearnside, 2012).
So, how can we apply modeling to REDD?  
(let’s keep us in business)

Tool for policy design and planning
Tool for REDD planning and management. Application to Acre

Simulation as a tool for regional planning
www.csr.ufmg.br/map

Method adopted by SISA
Setting priority areas for REDD

- Index of threat (time dependent) (Soares-Filho et al. PNAS, 2010)
Calculating costs of reduction

Amazon opportunity costs

Carbon cost along the deforestation frontier

(US$ ton of CO$_2$)
- > 10
- 3 to 10
- 2 to 3
- 1 to 2
- 0.5 to 1
- 0 to 0.5

(Nespdad, Soares-Filho et al. 2009; Soares-Filho et al. 2010)
Assessing effectiveness and leakage over time

Only monitoring deforestation is not enough.

Soares-Filho et al. PNAS. 2010.


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<th>Land use zones</th>
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<td>Unassigned land use</td>
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</tbody>
</table>
Which REDD projects in Madre de Dios can make a difference?

Hajek et al. 2011

Channeling REDD+ investments

Thank you/Obrigado/Gracias

Britaldo Silveira Soares Filho

*(the culprit for developing deforestation models that are now being applied to REDD+)*

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For many more examples, please access

http://www.csr.ufmg.br/dinamica/publications/publications.php

Modeling in support of sound policy

*Dinamica EGO* freeware can be downloaded at www.csr.ufmg.br/dinamica