

Environmental Reserve Quotas in Brazil's New Forest Legislation

April 18, 2017 – RESTORE+ Kick-Off Workshop

ipea Institute for Applied
Economic Research

Alexandre Ywata
*Director of Regional, Urban
Environmental Studies*



Bundesministerium
für Umwelt, Naturschutz,
Bau und Reaktorsicherheit

- Aline Soterroni (INPE)
- Fernando Ramos (INPE)
- Gilberto Câmara (INPE)
- Pedro Andrade (INPE)
- Ricardo Cartaxo (INPE)
- Aline Mosnier (IIASA)
- Florian Kraxner (IIASA)
- Johannes Pirker (IIASA)
- Michael Obersteiner (IIASA)
- Rebecca Mant (WCMC)
- Valerie Kapos (WCMC)
- Alexandre Ywata (IPEA)



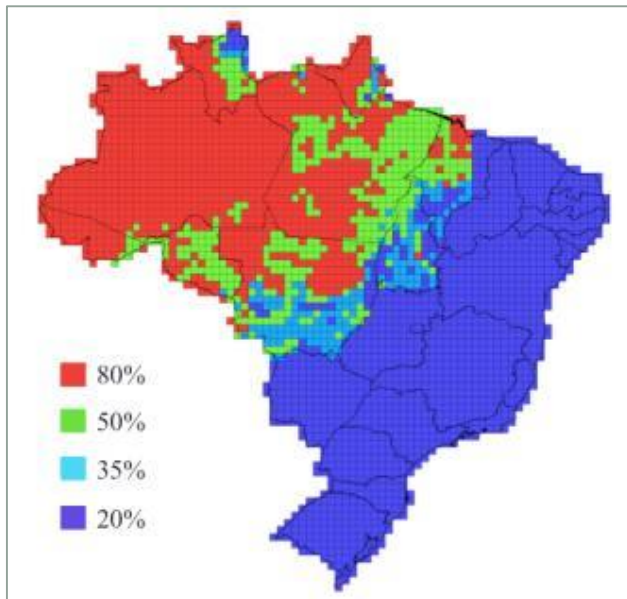
Legal Reserve (LR)

Permanent Protection Areas (APP)

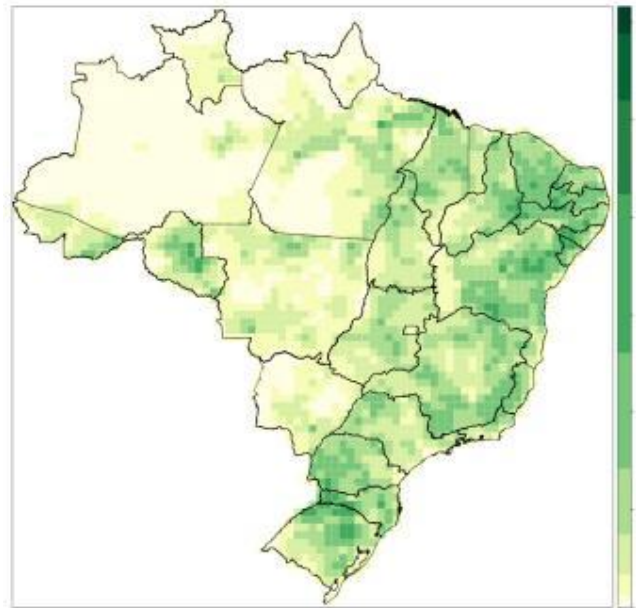
Small farms amnesty (SFA)

Environmental Reserve Quota (CRA)

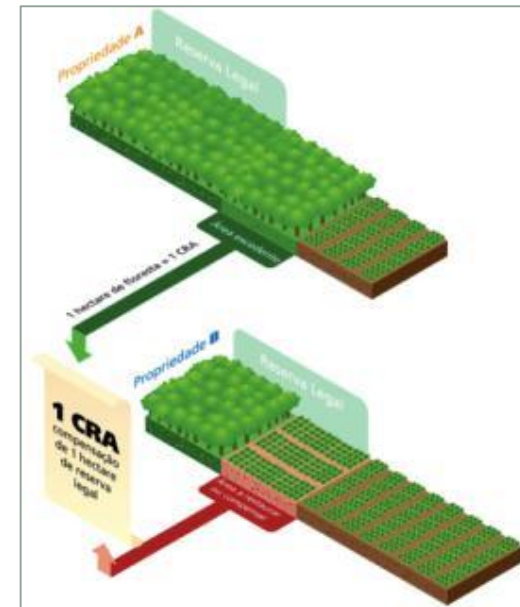
LR



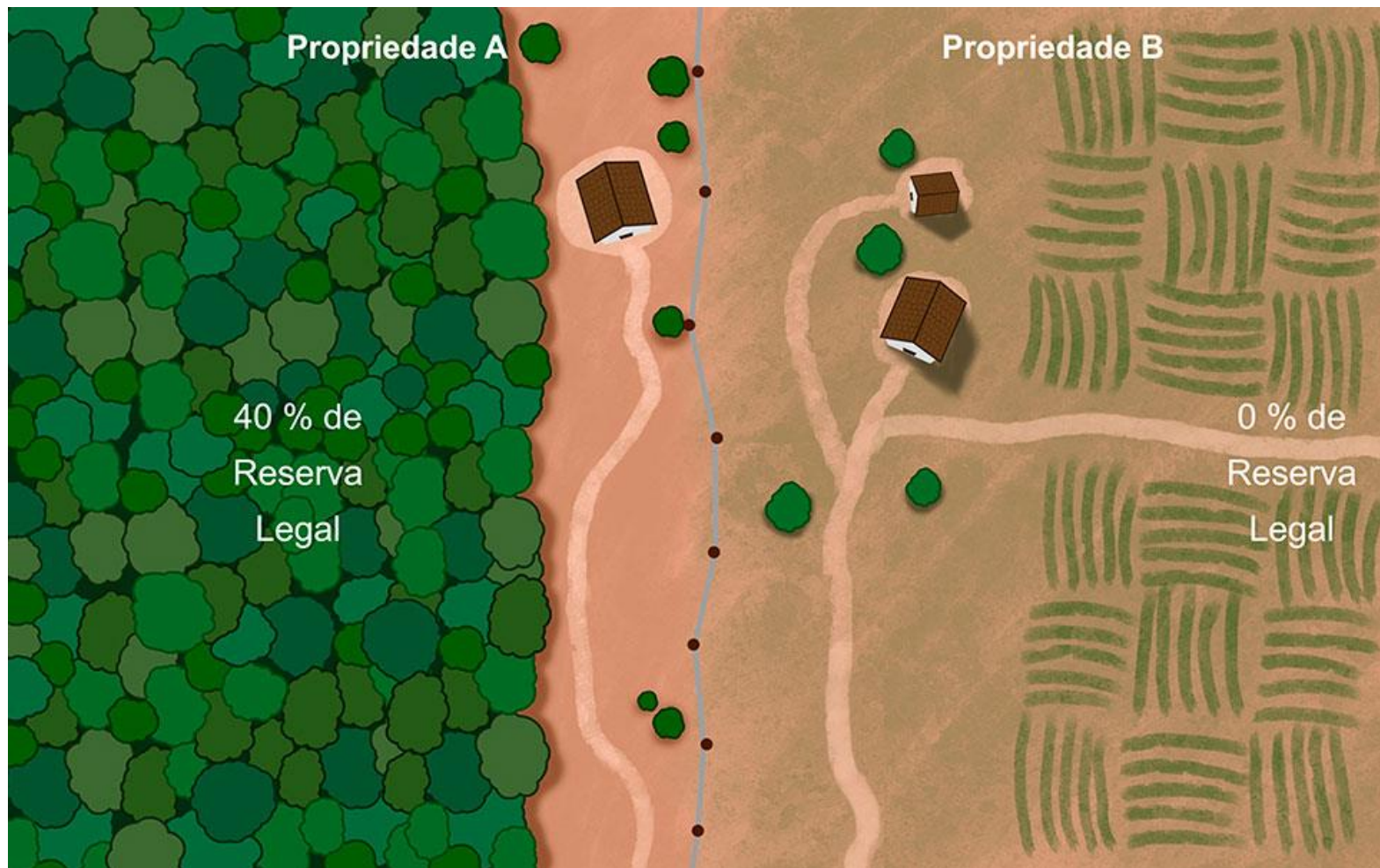
SFA



CRA



- Legal Reserve varies from 20% to 80%; properties with forest < LR will have to recompose the forest in 20 years
- Otherwise, he can, within the same biome:
 - Donate to the government an area within conservation unit, still not regularized with previous owners
 - The same owner can compensate with LR in another property
 - Environmental servitude – owner voluntarily renounces his right to explore part of the forest
 - **Buy Environmental Reserve Quotas (CRA)**
- Outside the same state, the compensation has to be in priority areas (according to state or federal government)



- Demand side - recompose LR versus buy CRA:
 - If he decides to buy CRA
Reward 1 = Revenues – Production Costs – Risk Adjustment – CRA Price
 - If he decides to recompose LR
Reward 2 = - Reforestation Cost (Passive or Active) + Forest Revenue (?)
 - If he decides to do nothing
Reward 3 = Revenues – Production Costs – Risk Adjustment
- **Expected Fine x Probability of being caught**

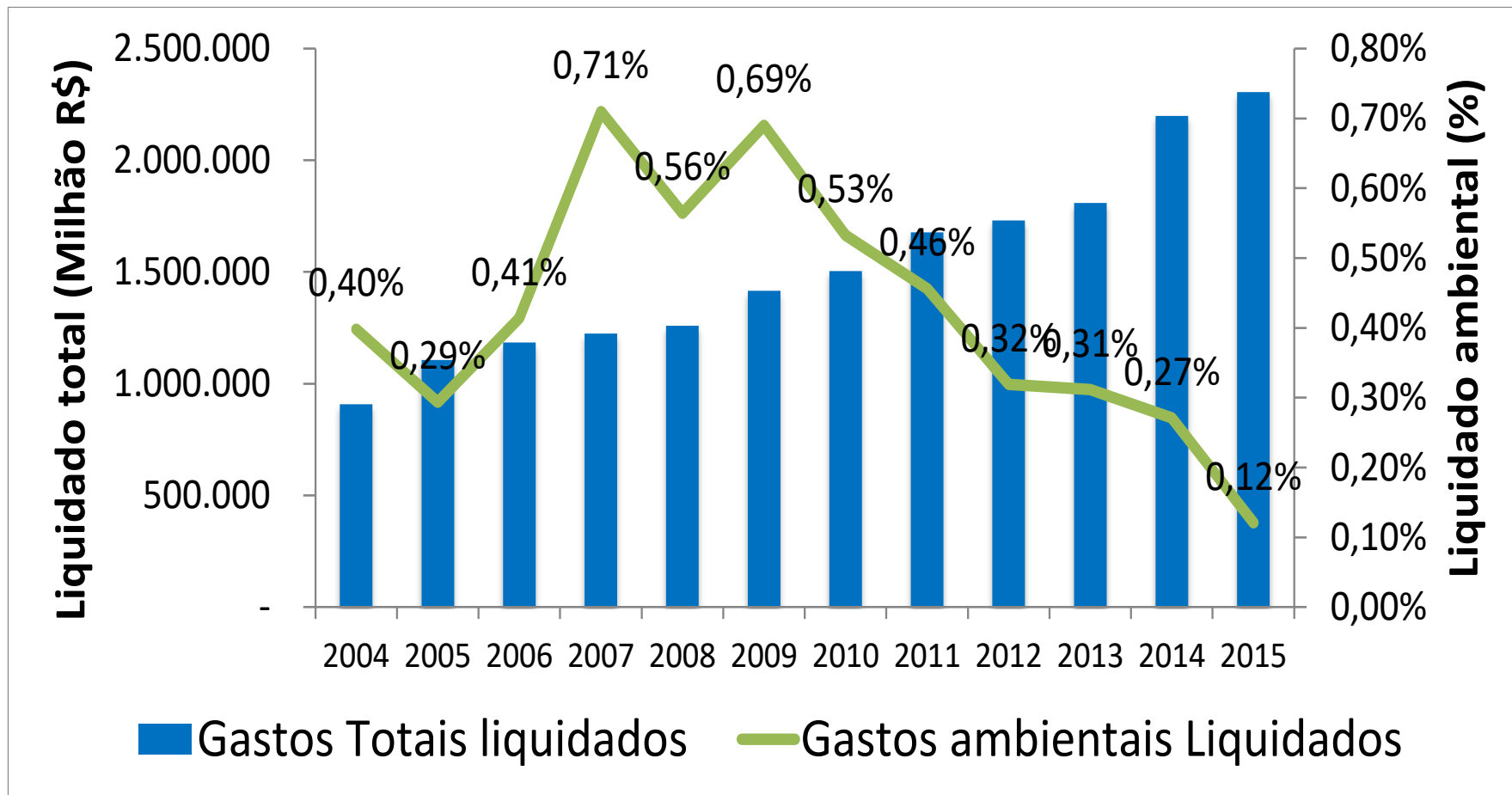
Decision to Buy: Reward 1 > Reward 2 and Reward 3

- Supply side – sell CRA or use commercially:
 - If he decides to sell CRA
Reward 3 = CRA Price
 - If he decides to explore
Reward 4 = Revenues – Production Costs – Risk Adjustment

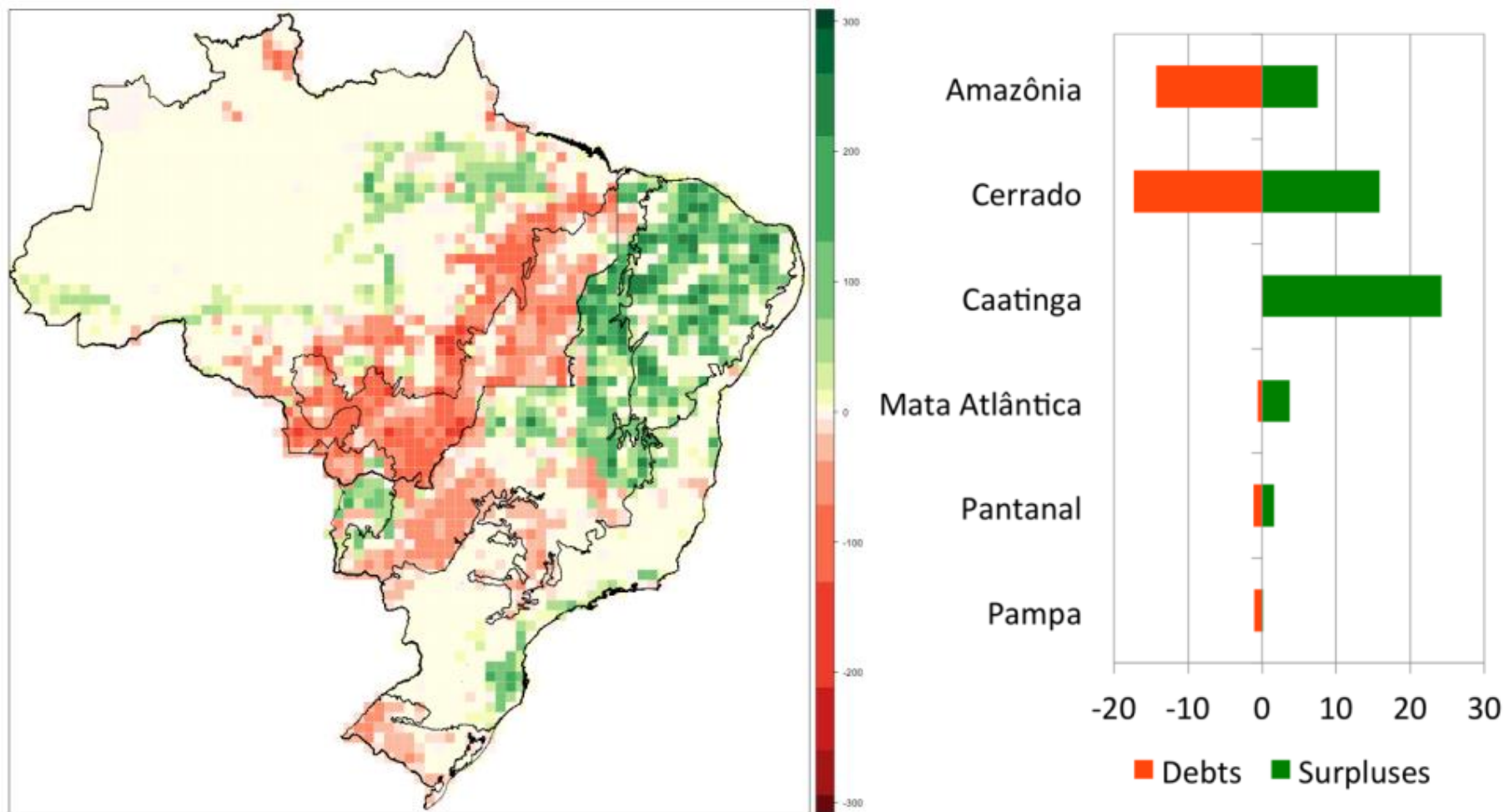
Decision to Sell: Reward 3 > Reward 4

Challenge Ahead – Need for Market Solutions

- Government budget for environmental actions



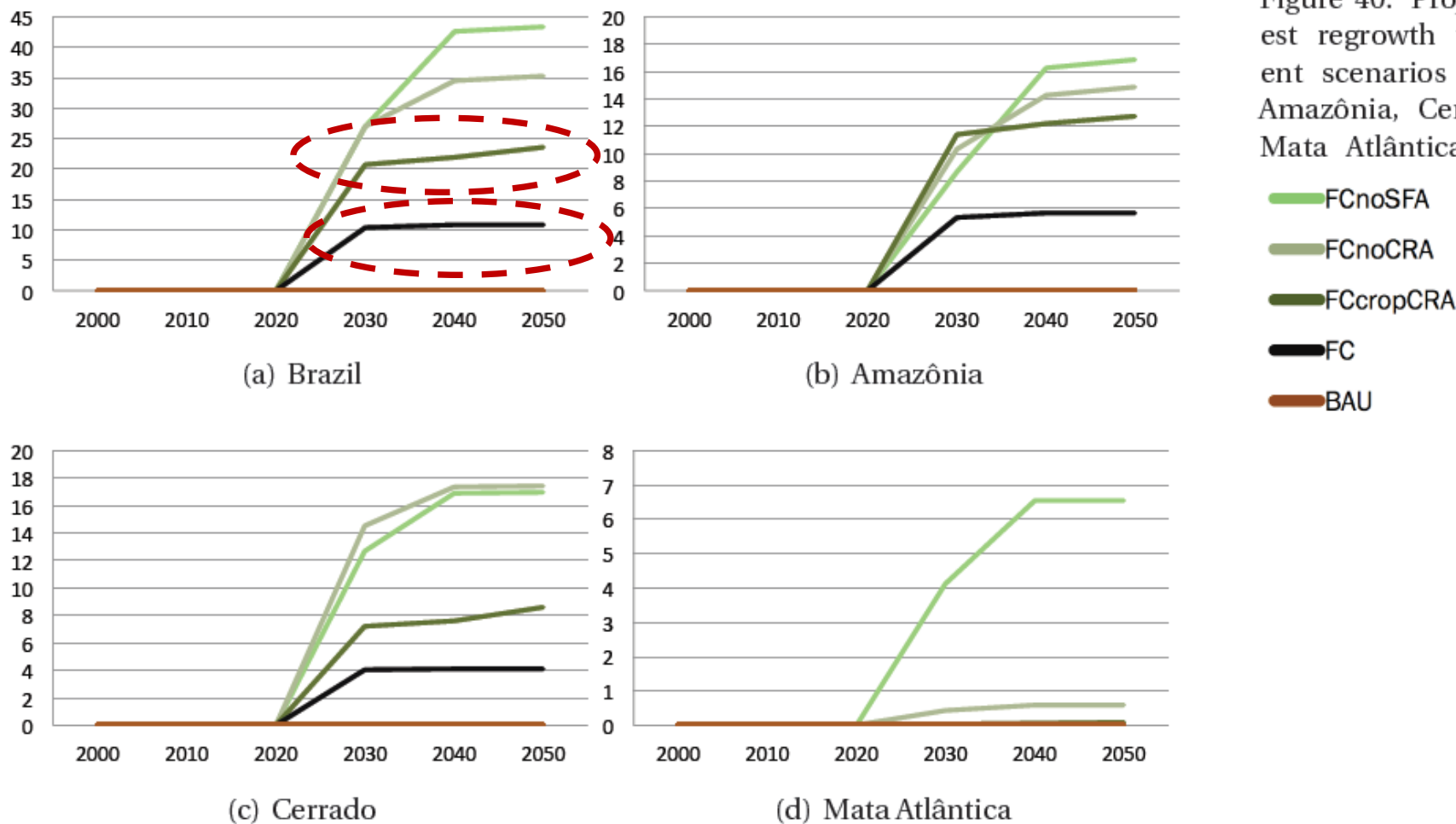
Environmental Debts and Surpluses (2010)



Potential surpluses from Amazonas, Amapá and Roraima were not considered

- CRA in GLOBIOM considered:
 - Simulation areas with larger LR surplus will sell CRA first
 - Simulation areas with larger LR deficits will by CRA first
 - Market operations are completed till surplus or deficits reaches zero
 - In general crop areas are more profitable
 - We considered a scenario in which only LR deficits in crop areas buy CRA
 - Only LR surplus in non-crop areas sell CRA
- Need to integrate GLOBIOM optimization structure with econometric models for estimation of [**Revenues – Production Costs – Risk Adjustment**]
- Need spatially explicitly information on restoration costs
- Market equilibrium for supply in demand within different markets

GLOBIOM-Brazil projections for forest regrowth



Thank you very much!

Alexandre.Ywata@ipea.gov.br

ipea Institute for Applied
Economic Research