Case-study

Multi-‘steak’holder sustainability: reduced deforestation and the cattle agreement in Brazil

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Case-study learning objectives

- Understand common trade-offs between conservation and development objectives
- Understand concepts and methods from land change science, production economics, and supply chain analysis, and linkages between these disciplines
- Understand different disciplinary and policy perspectives and priorities
- Evaluate the roles of private-sector, government, and civil society agencies in solving complex socio-environmental problems
- Evaluate the impacts of governance mechanisms over a range of timescales
- Apply concepts and methods from multiple disciplines to solve complex socio-environmental problems
- Analyze data to evaluate policy effectiveness in the context of a complex socio-environmental problem
- Create a persuasive argument that synthesizes literature and data to define and justify a position

Case-study themes

- How voluntary environmental agreements can come into practice
- Different scholarly perspectives on deforestation
- How to assess the impacts of agriculture on deforestation
- Essential elements of impact evaluation of deforestation policy
- Conservation and development tradeoffs in tropics
- Role of spatial analysis for supporting sustainable land use
- How retailers can support sustainable land use

Case-study structure

Seven lessons

Lesson 1 - Introduction to the cattle agreement in Brazil

Lesson 2 - Supply chain governance

Lesson 3 – Scholarly perspectives on tropical agriculture and forest tradeoffs

Lesson 4 - The governance of cattle production in Brazil

Lesson 5 - Evaluating avoided deforestation

Lesson 6 - Spatial analysis of agriculture and deforestation

Lesson 7 - Synthesis: roundtable discussion

Case-study

Lesson 1: Introduction to the cattle agreement in Brazil

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Key messages & skills

Message

- Commodity production in tropical forest and agricultural landscapes presents complex environmental, social, and economic challenges

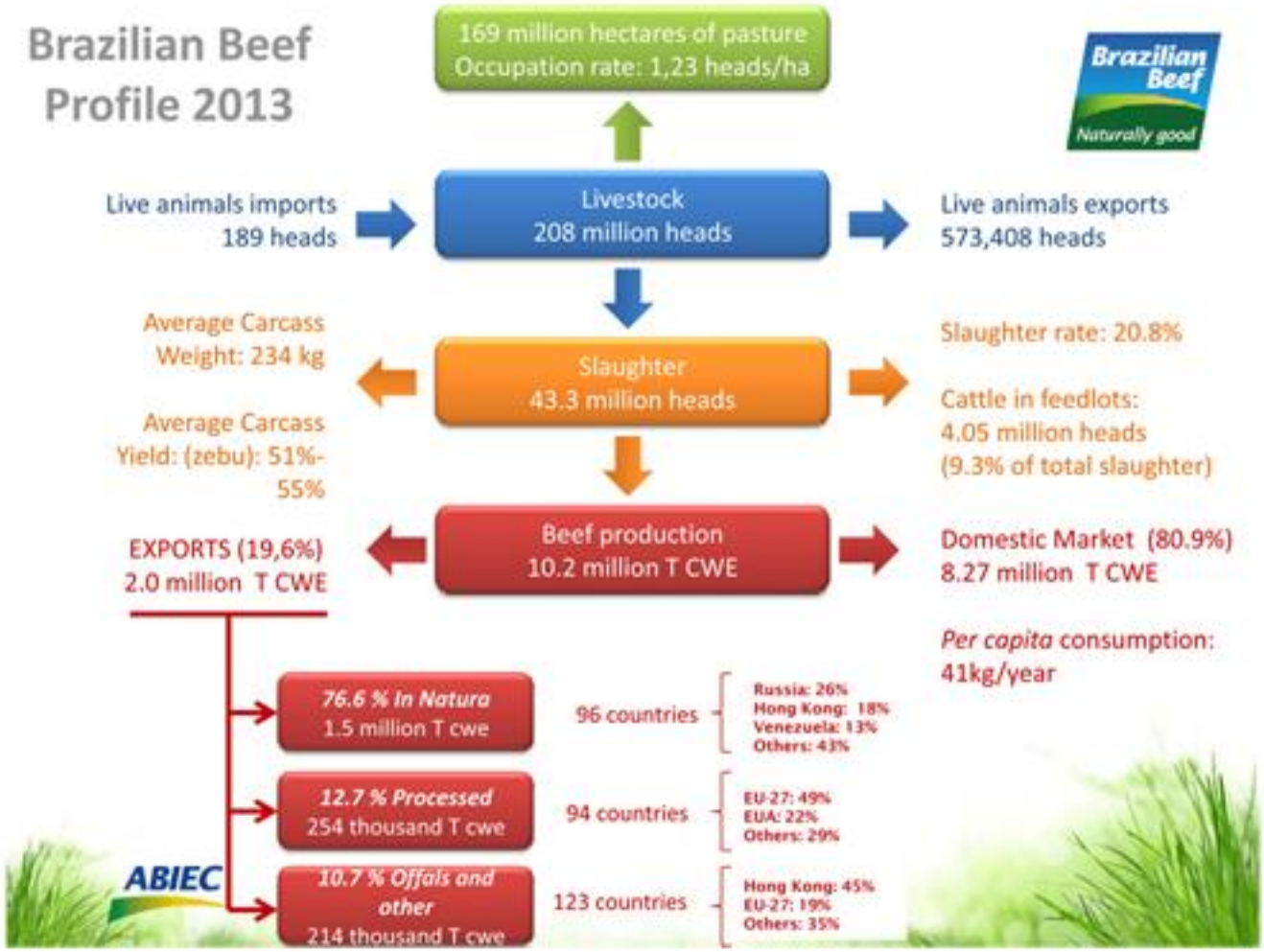
Skill

- Synthesize information from a range of popular media, to understand the context and key concepts of a previously-unfamiliar case study

Introduction to the cattle sector in Brazil

- 200 million head - world's largest *commercial* cattle herd
- 200 million ha occupied (approx. 25% of the area of the U.S.)
- Mostly pasture-fed, not grain
- Low revenue per unit area, relative to mechanized agriculture
- Primarily domestic market; steadily growing export market
- Consistently top three in exports

The Brazilian cattle sector



Source: Brazilian Association of Cattle Producers, 2014

Cattle rancher behavior

(adapted from Bowman et al. 2012)

Cattle as a means to:

- Make profit from sale of meat, milk, and leather
- Hedge against inflation
- Receive government subsidies
- Have cultural prestige
- Stake claim to frontier lands

Quiz

a. What are the key environmental impacts of cattle production in Brazilian Amazonia?

b. What were the roles of a) civil society, b) private sector, and c) government individuals and organizations in the events leading up to the signing of the cattle agreement?

c. What are the key commitments made by signatories to the cattle agreement?

Cattle in Brazil: environmental impacts

1. Deforestation

- Cattle are responsible for as much as 80% of Brazil's deforestation (Bustamante et al. 2012)
  - E.g. Total deforestation in Brazil: 26,000 ha in 2004; 8,000 ha in 2009
- Deforestation leads to loss of biodiversity and environmental services
- Deforestation is a major source of greenhouse gas emissions (~20% globally)

Cattle in Brazil: environmental impacts

2. Greenhouse gas (GHG) emissions

- Cattle are responsible for as much as 50% of Brazil's GHG emissions (Bustamante et al. 2012)
  - Brazil is a top-ten GHG emitting nation
- Methane and deforestation are the main sources of cattle GHGs
- Methane emissions come from enteric fermentation: anaerobic breakdown of carbon in chambered stomachs
- GHG emissions depend on where cattle are grazed, diet, and age of cow at slaughter

Actor roles in the cattle agreement

Civil society

Environmental NGOs (e.g. Greenpeace) – pressure and visibility

Private sector

Retailers (e.g. Nike, Timberland, Adidas, McDonald's, Walmart, the Brazilian Association of Supermarkets) – pressure on meat processors

Meat processors (e.g. Bertin, JBS, Marfrig, Minerva) – adopted the agreement

State

Brazilian government – supports the agreement (e.g. imagery for monitoring)

Key commitments

The cattle agreement

- Zero deforestation
- Protection of protected areas and indigenous lands
- No slavery
- No land-grabs or land-conflicts
- Implementation of a tracking system
- Implementation of supply chain commitments

Additional questions

1. What sort of impacts might the cattle agreement have on people, business, and the environment?

2. Approximately 25% of Brazilian cattle products are internationally traded. What might be the relative effects of the cattle agreement if an a) greater or b) lesser proportion of cattle products were internationally traded?

Wrap up

- Commodity production in tropical forest and agricultural landscapes presents complex environmental, social, and economic challenges

Case-study

Lesson 2: Supply chain governance

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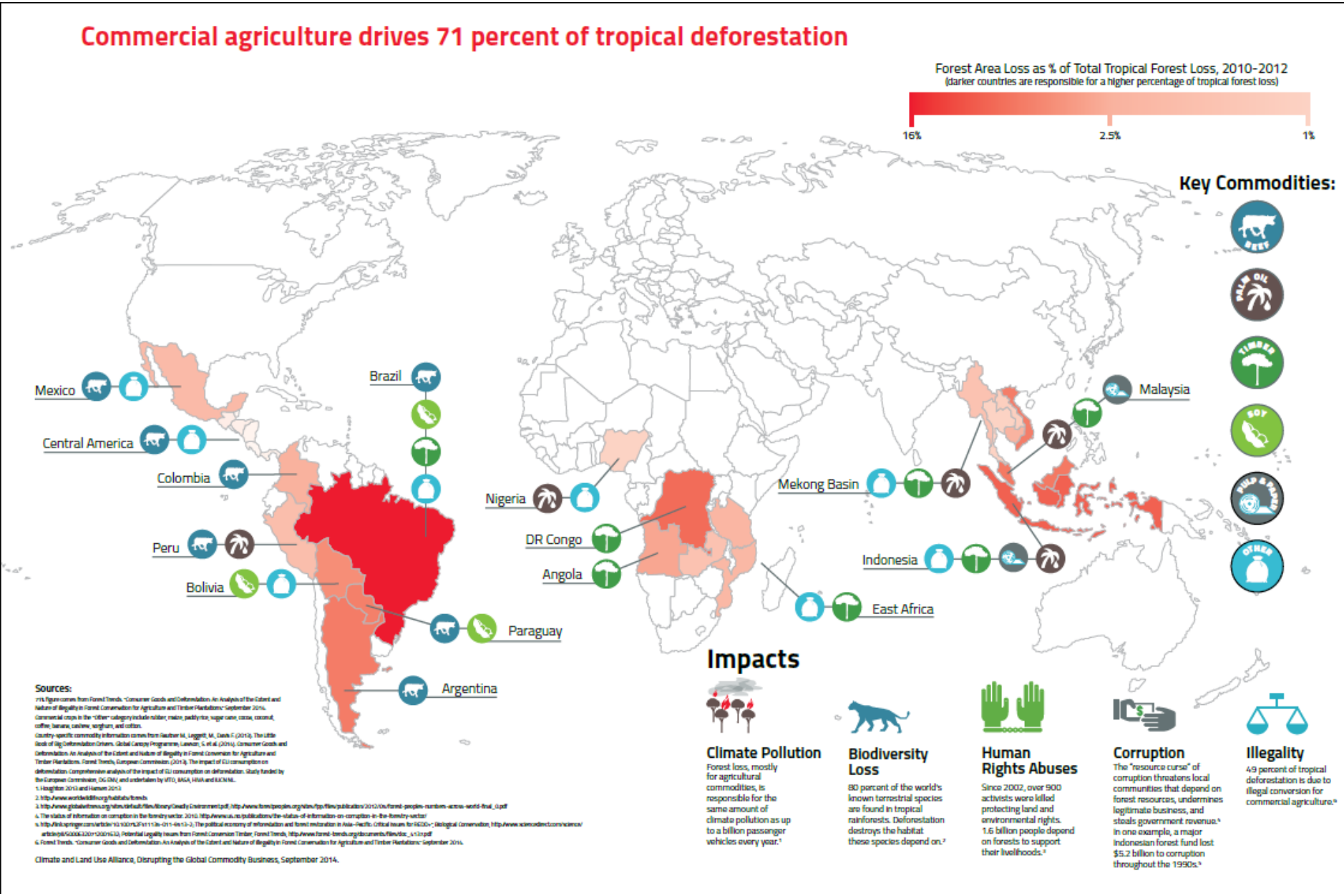
Key messages & skills

Messages

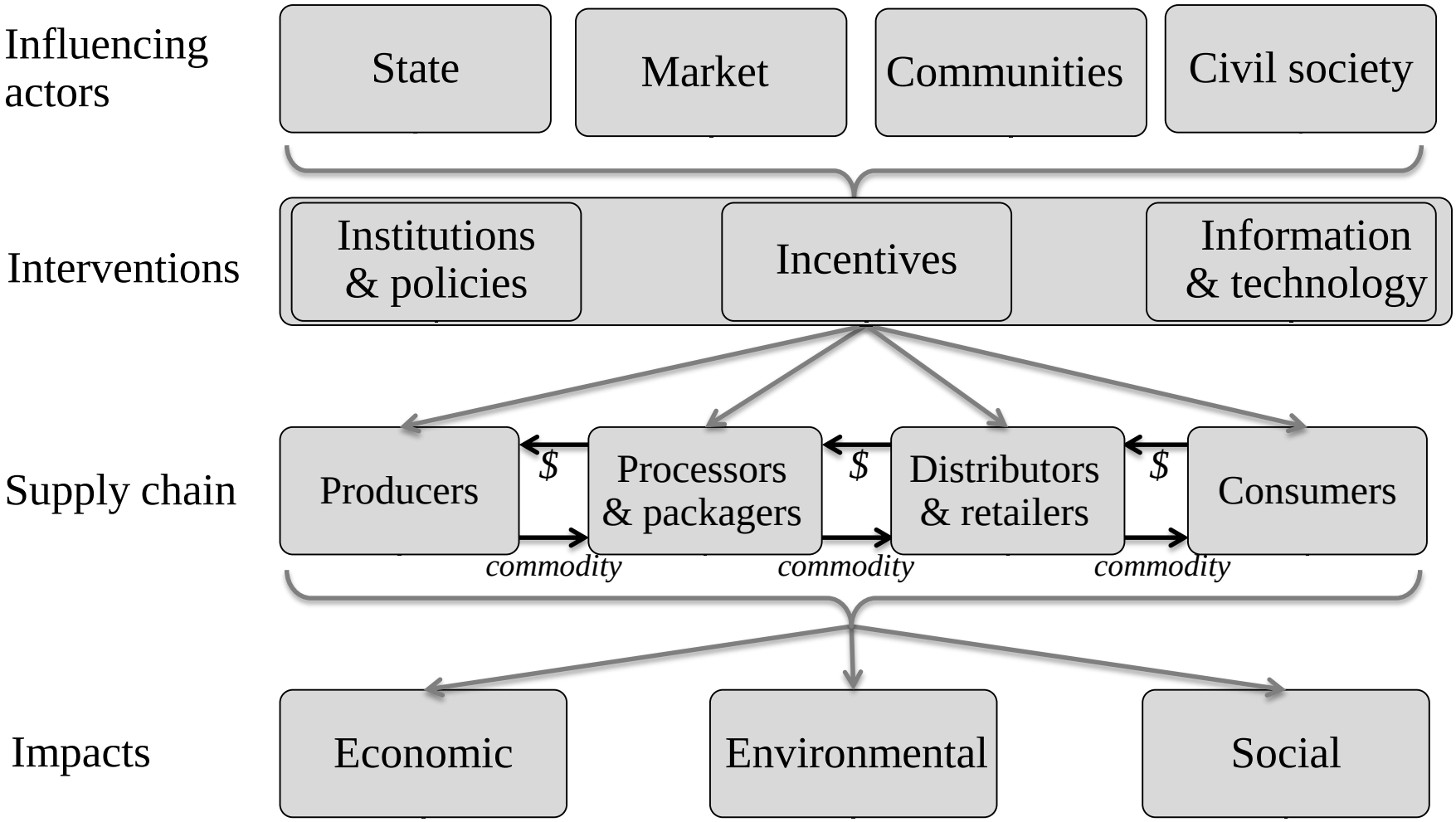
- Supply chains connect different actors across space and time
- Supply chain governance interventions can thus affect where and how commodity production occurs

Skill

- Synthesize information from a range of sources (e.g. academic journals; popular media)



Source: Climate and Land Use Alliance, 2014 – Disrupting the global commodity business



Source: Newton et al. 2013 Global Environmental Change

Sketch a commodity supply chain for cattle products from the Brazilian Amazon

Use Fig. 1 in O'Rourke (2014) as a template, and elements of Walker et al. (2013) as a source of information on the cattle sector in Brazil.

Include different types of actor (e.g. producer, consumer) and their relationships to each other. Add other elements of the socio-environmental system to this supply chain diagram - including elements of the biophysical system (e.g. different land uses and biomes); impacts (e.g. environmental, social); and an indication of the stage(s) in the supply chain where the cattle agreement affects the supply chain.

Wrap up

- Supply chains connect different actors across space and time
- Supply chain governance interventions can thus affect where and how commodity production occurs

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Lesson 3: Perspectives on tropical agriculture and forest tradeoffs

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Lesson 4: The governance of cattle production in Brazil

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Key messages & skills

Messages

- A diverse array of interrelated interventions is operating in the same sector (the cattle supply chain in Brazil) and the same landscape (forest, agricultural, and development policy operate in the same space and time).

- Different interventions variously support different environmental, social, and economic goals. Interactions between interventions therefore represent both trade-offs and synergies.

Skill

- Succinctly summarize and clearly present information to a peer group.

The cattle agreement

Interactions between interventions

Interventions may demonstrate

- Complementarity
- Substitution
- Antagonism

E.g. with respect to the cattle agreement

- CAR
- Certification
- ‘Meatless Mondays’

Wrap up

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- Different interventions variously support different environmental, social, and economic goals. Interactions between interventions therefore represent both trade-offs and synergies.

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Lesson 5: Evaluating avoided deforestation

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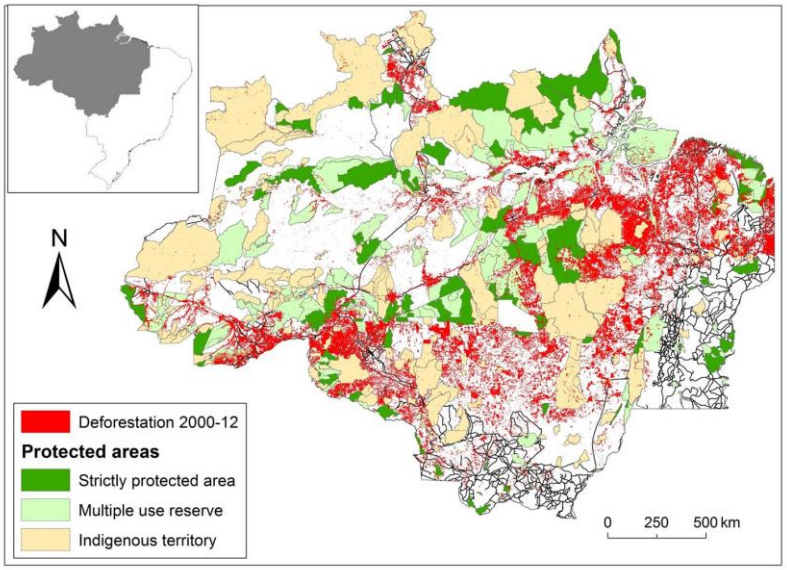
Lesson 6: Spatial analysis of agriculture and deforestation



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Lesson 7: Synthesis - roundtable discussion

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Key messages & skills

Messages

- Multiple stakeholders in a complex socio-environmental system have divergent perspectives and objectives.
- Governance interventions may present trade-offs and synergies between different outcomes.

Skill

- Construct a cohesive argument from a perspective that may differ from your own.
- Respond appropriately when challenged by alternative perspectives.

Multi-stakeholder processes

- Many sustainability initiatives emphasize the need for input from a diversity of stakeholders: from government, the private sectors, and civil society
- Variation in priorities, opinions, perspectives, experiences, and information
- Complex, multi-faceted issues with no single clear solution
- Trade-offs and synergies between different objectives and actions
- Greater support for, and legitimacy of, an agreed set of actions if more stakeholders contribute
- *Examples*: agricultural certification, commodity roundtables

Case-study: Reduced deforestation and the cattle agreement in Brazil

Should Whole Foods should buy beef from JBS farms in Brazil?

Should Whole Foods should buy beef from JBS farms in Brazil?

1. What environmental, social, or economic outcomes are of highest priority to this actor? What are the costs and benefits for this actor of supporting the cattle agreement?

2. What data and/or analyses would enable this actor to make more informed decisions about how to act (with respect to support of the cattle agreement)?

3. Are there other mechanisms that would be a better way to achieve this actor's desired outcomes than the cattle agreement?

Wrap up

- Multiple stakeholders in a complex socio-environmental system have divergent perspectives and objectives.
- Governance interventions may present trade-offs and synergies between different outcomes.