

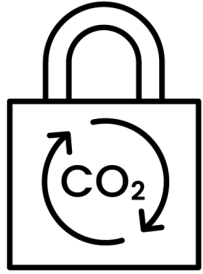
The effectiveness of corporate zero-deforestation commitments at reducing agricultural deforestation in Brazil

SFIAR award 2023 | 1 2.12.2023

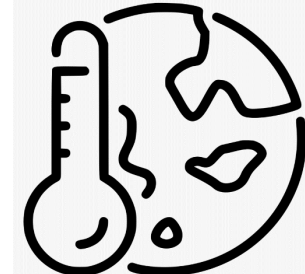
Samuel Levy, Federico Cammelli, matthieu Stigler, Holly Gibbs, Jacob Munger, Erasmus zu Ergmassen, Vivan Ribero, Anna Nogueira Garik, Rachael Garrett



Background > Tropical ecosystems



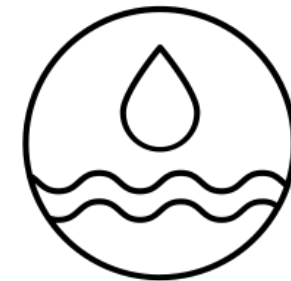
carbon storage & sequestration



prevent climate change



biodiversity



water resources

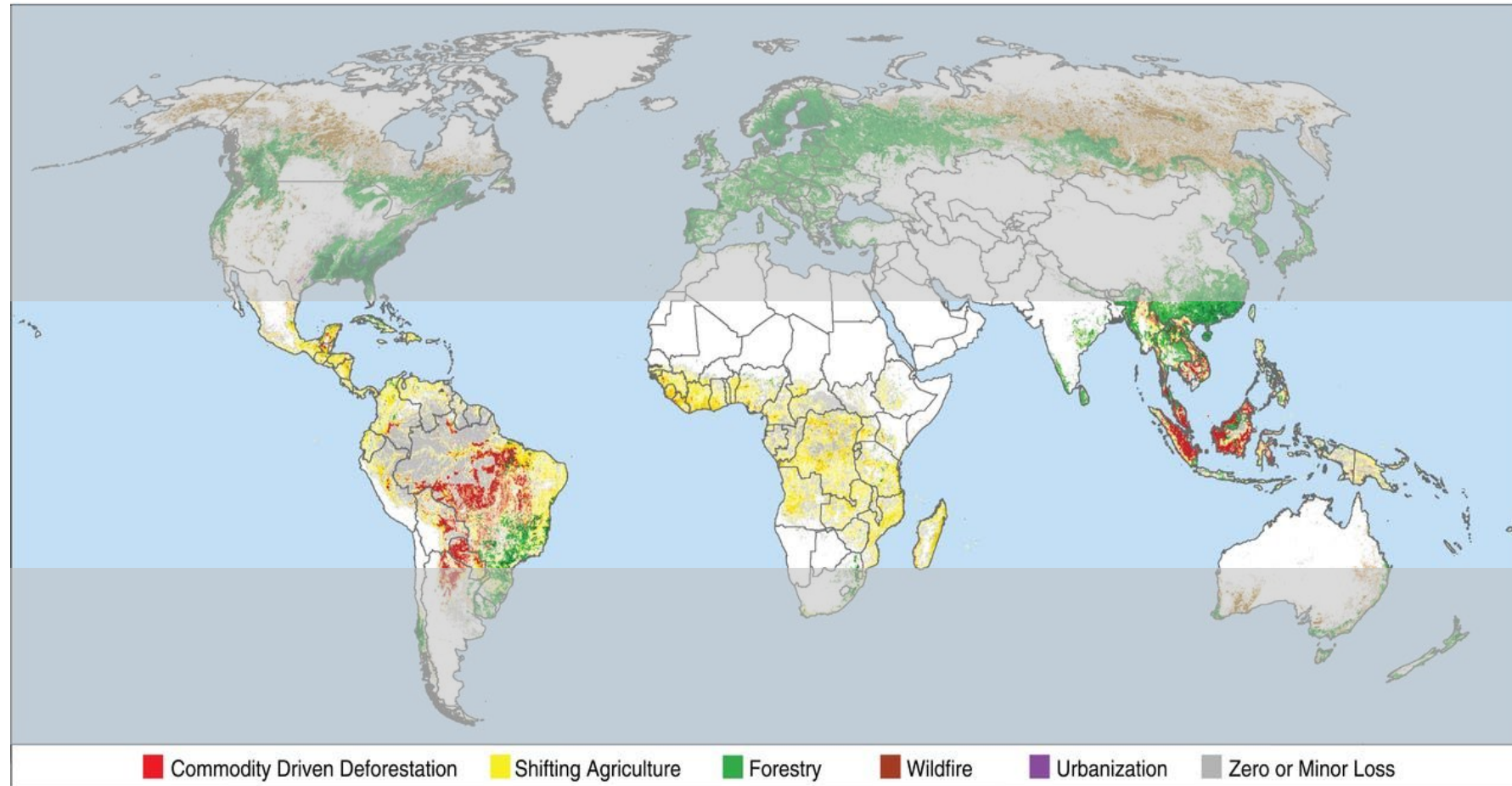


global economy



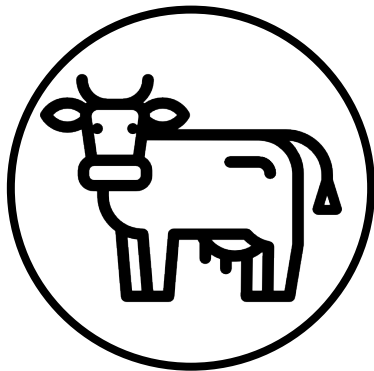
livelihoods

Background > Tropical deforestation

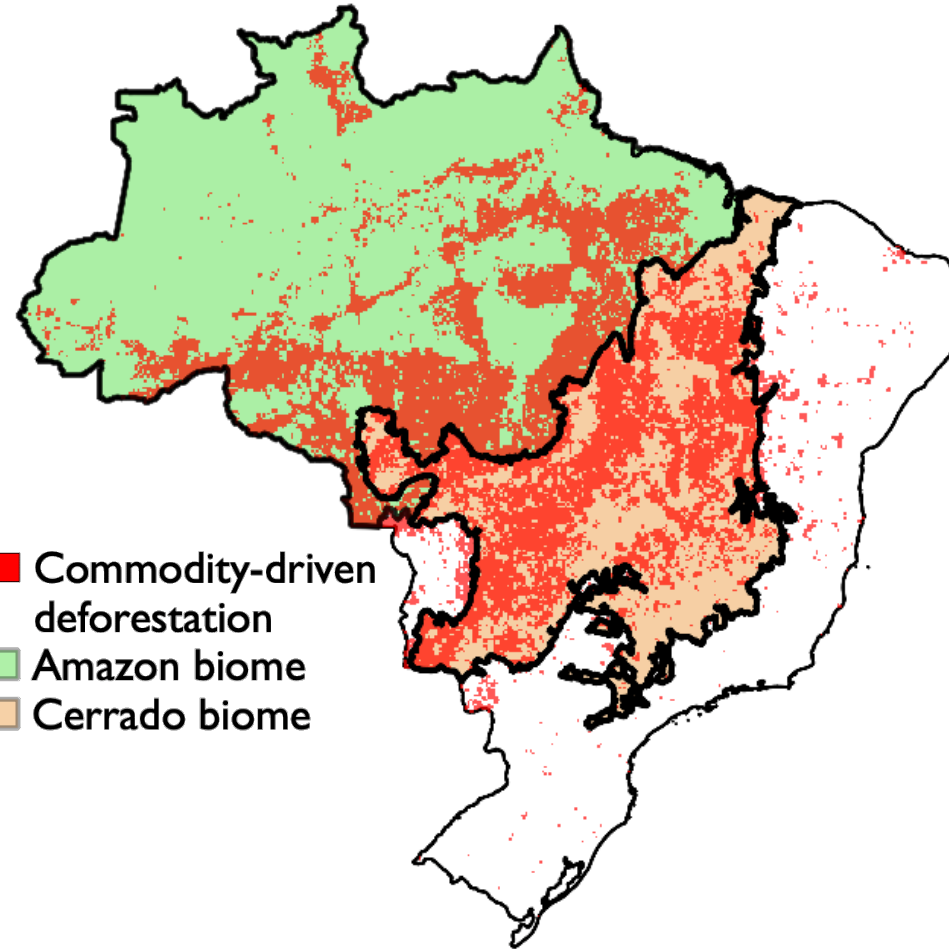


Commodity production is the largest driver of forest loss globally

Curtis et al. (2018)



Cattle



- Commodity-driven deforestation
- Amazon biome
- Cerrado biome



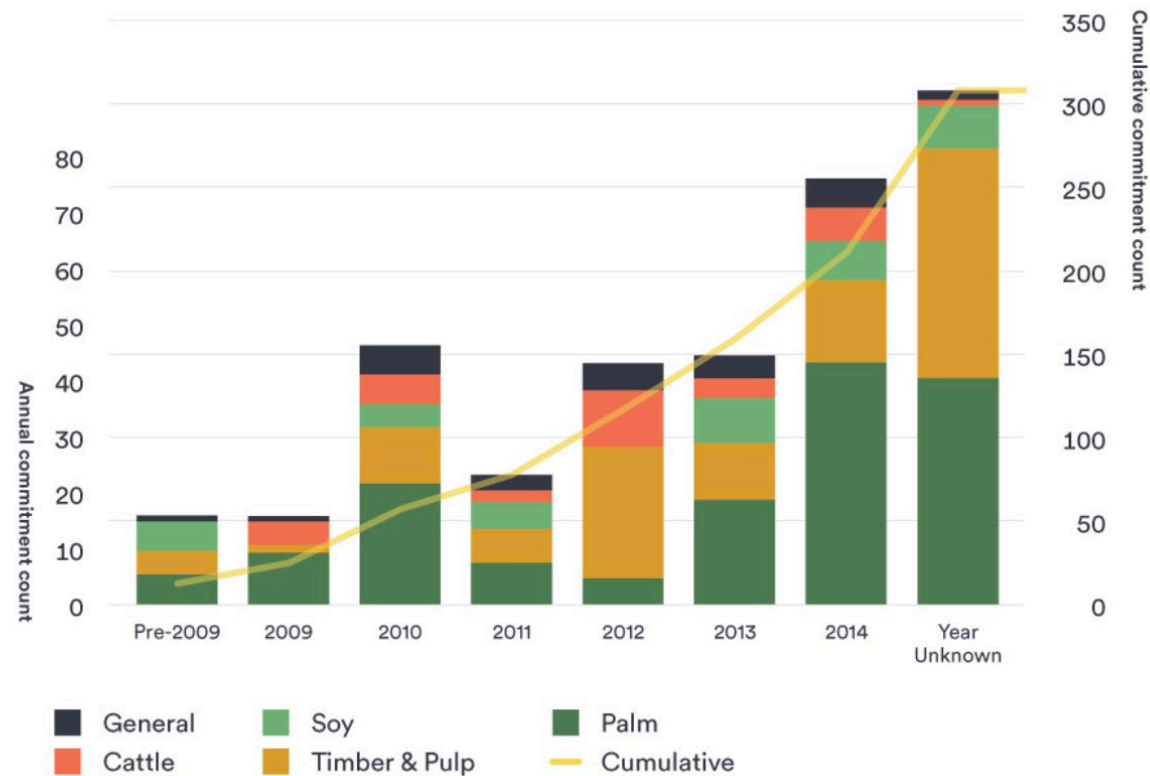
Soybeans

Commodity-driven deforestation 2001-2019
adapted from Curtis et al. (2019)

Background > Zero-deforestation commitments (ZDCs)

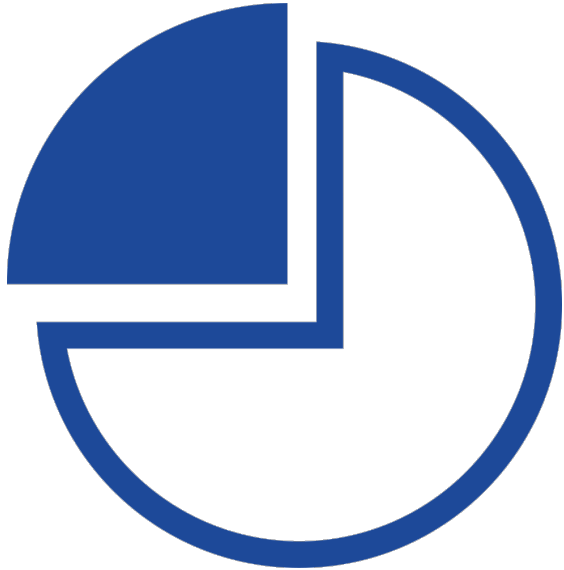
ZDCs: “Sustainability initiatives that signal a company’s intention to eliminate deforestation from its supply chain”

Garrett, Levy et al. 2019

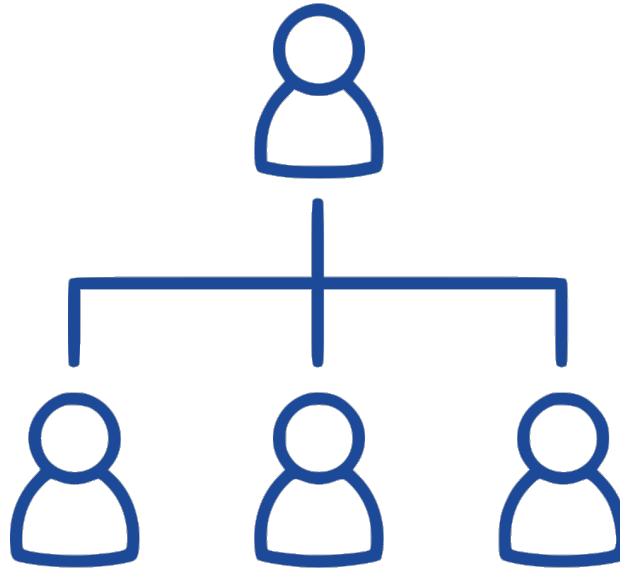


Key uncertainties to ZDC effectiveness

1 Limited **adoption** of ZDCs within a sector

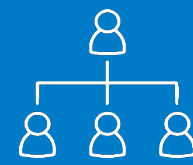


2 Commodities, actors, & regions outside ZDC **scope**



3 Role of political **narratives** & discourses in augmenting ZDC outcomes





Quantifying ZDC effectiveness & loopholes in the Amazonian cattle sector



ZDC loopholes

ZDC effectiveness =
Deforestation free supply

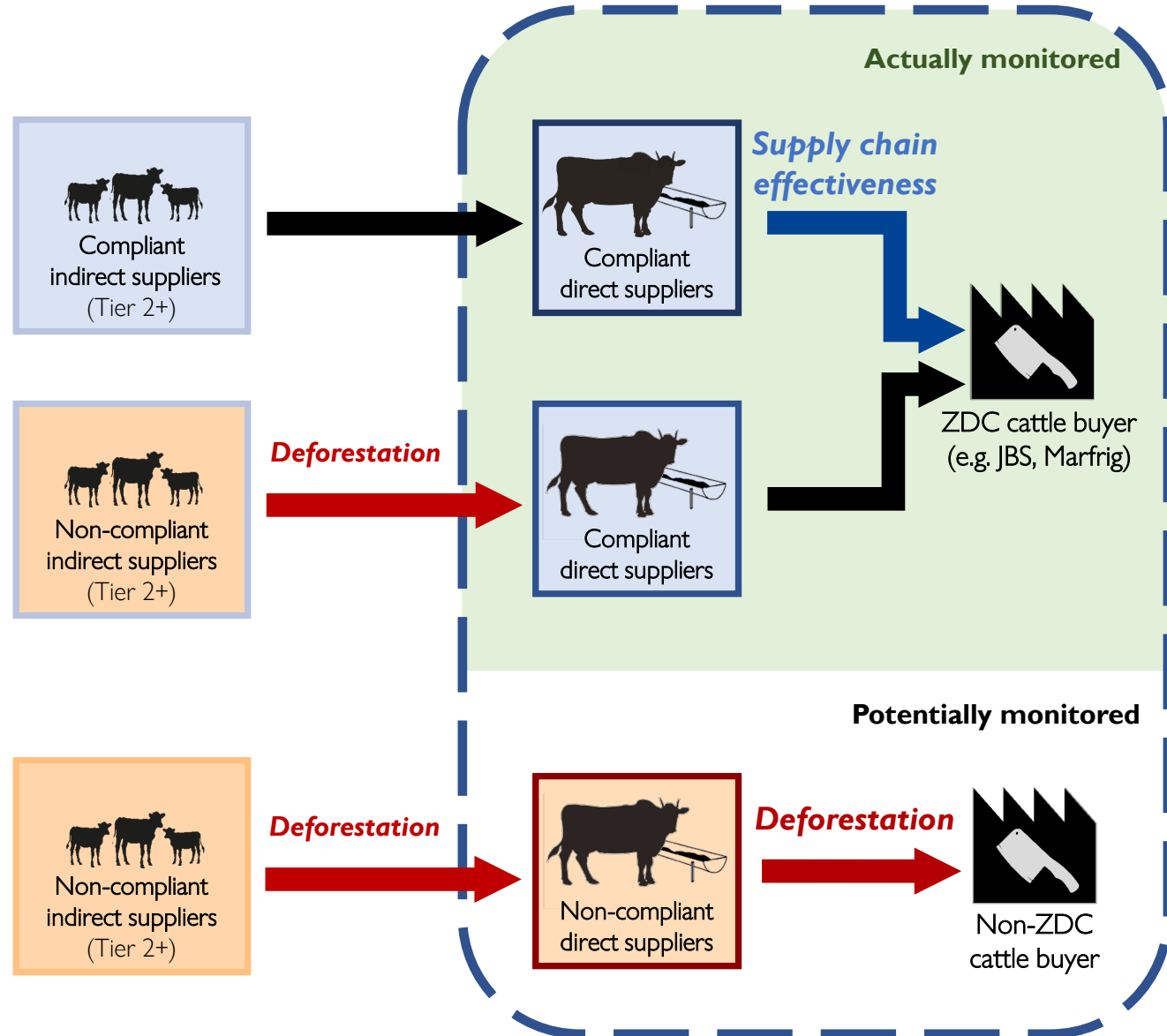
Garrett, Levy et al. 2019;

Loophole 1 =
indirect ZDC suppliers

Klingler et al. 2017; Gibbs et al. 2015

Loophole 2 =
non-ZDC suppliers

Garrett, Levy et al. 2019; Pereira et al. 2020



Methods: Property level ZDC treatment

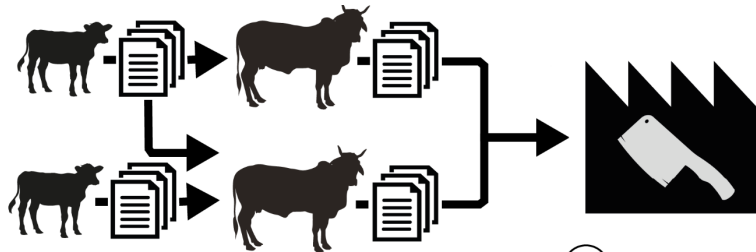
Scale: property
Region: PA
Period: 2009-2020

Company commitments (Imazon, 2017; Trase, 2021)

Company	Year introduced	Region	Scope	Cut-off for deforestation
Marfrig	2009	Brazilian Amazon	Zero deforestation	2009
Minerva	2009	Brazilian Amazon	Zero deforestation	2009
JBS	2009/2014	Brazil	Zero deforestation	2009/2014
Mercurio Alimentos	2009	Brazilian Amazon	Zero illegal deforestation	2009/2010
Frigol	2009	Brazilian Amazon	Zero illegal deforestation	2009/2010



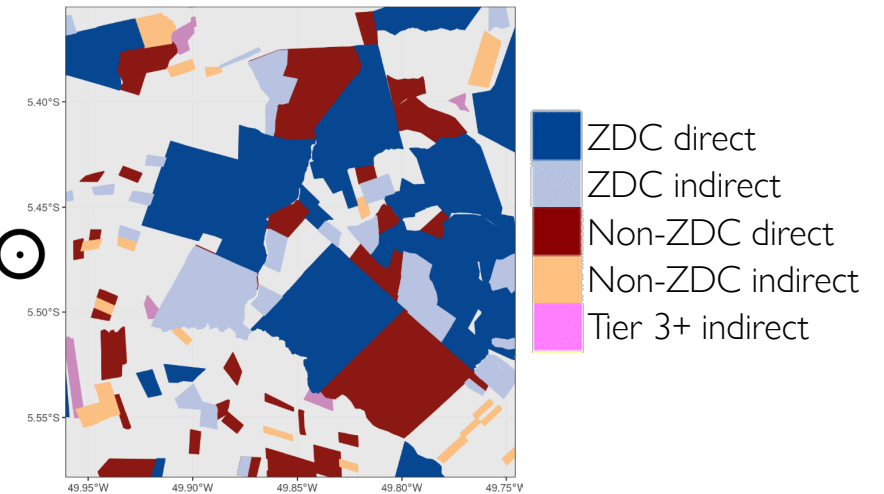
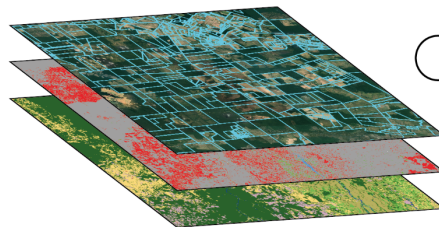
Supply chain data (MAPA, 2021; ADEPARÁ, 2021)



Spatially & temporally explicit dataset of ZDC & non-ZDC supply chains

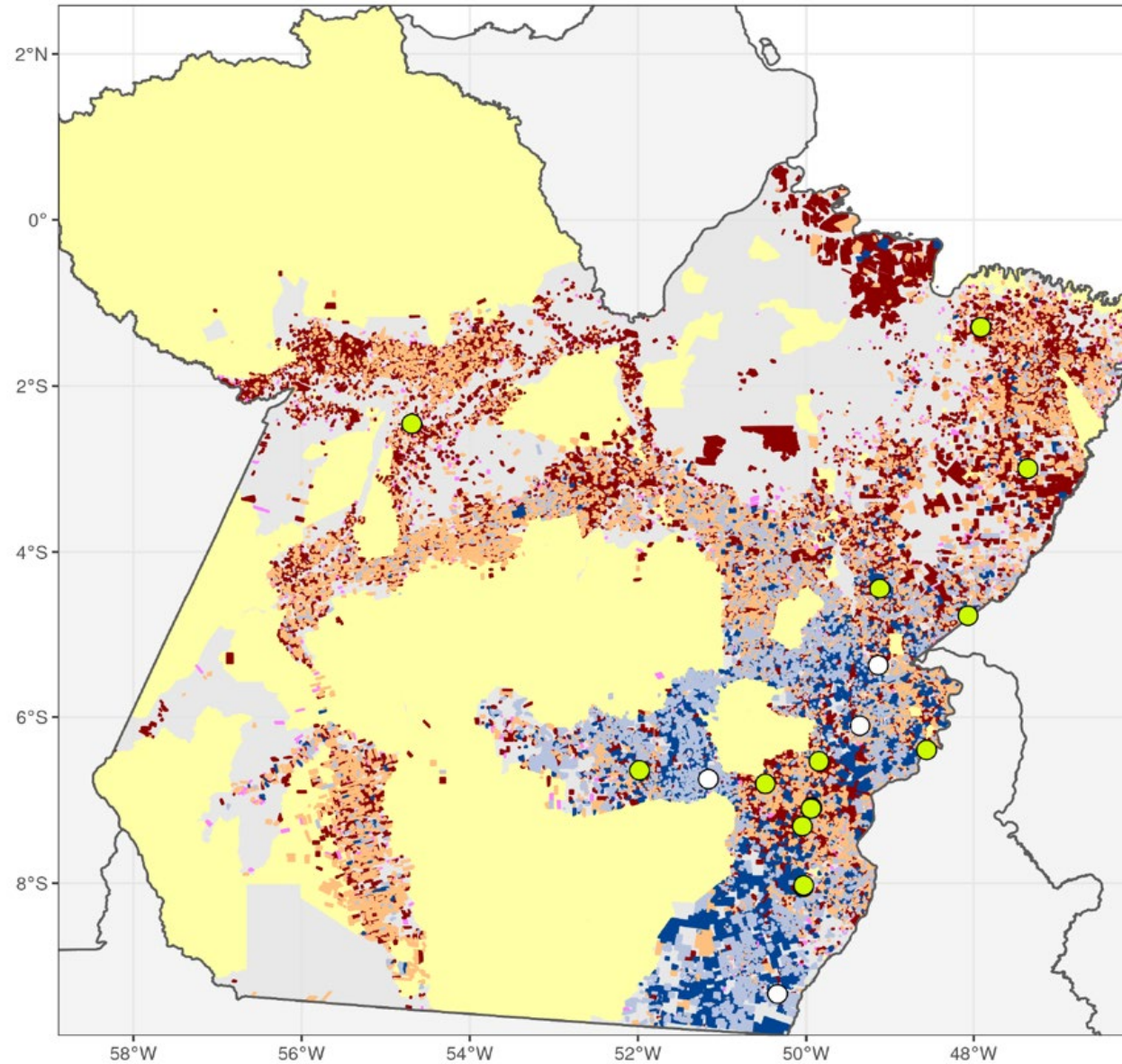
Property boundaries (SICAR, 2021)

LULUC data (INPE, 2021; MapBiomass, 2021)



1 > Methods > Property level ZDC treatment

Scale: property
Region: PA
Period: 2009-2020

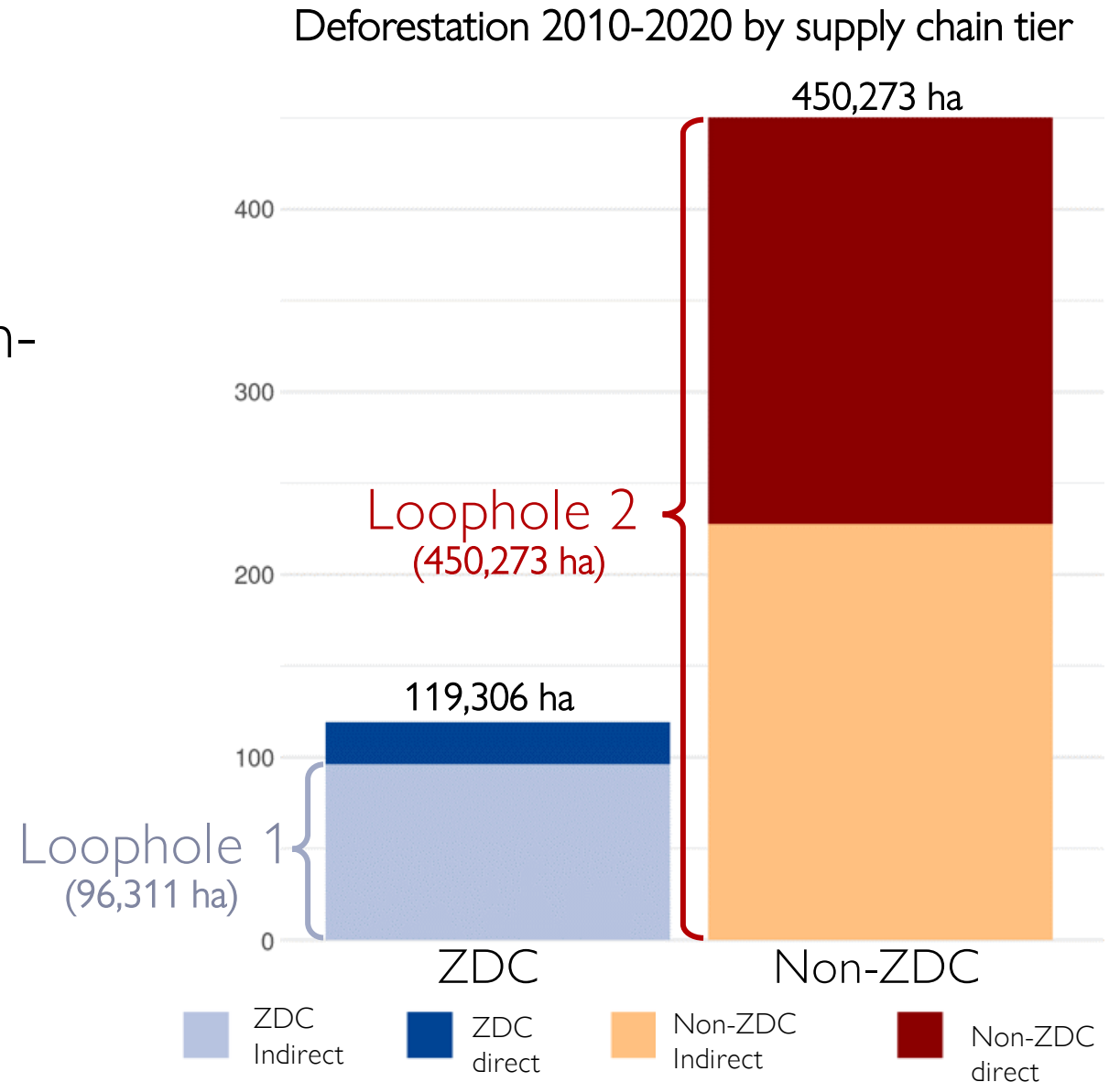


- ZDC direct
- ZDC indirect
- Non-ZDC direct
- Non-ZDC indirect
- Tier 3+ indirect
- Protected Areas
- ZDC slaughterhouse
- Non-ZDC slaughterhouse

Laundering & ZDC avoidance drive deforestation

Scale: property
Region: PA
Period: 2010-2020

- **74%** of all deforestation occurred in non-ZDC supply chains (**loophole 2**)
- Within ZDC supply chains, **81%** of deforestation occurred on indirect suppliers' properties (**loophole 1**)



Methods: Municipal market share

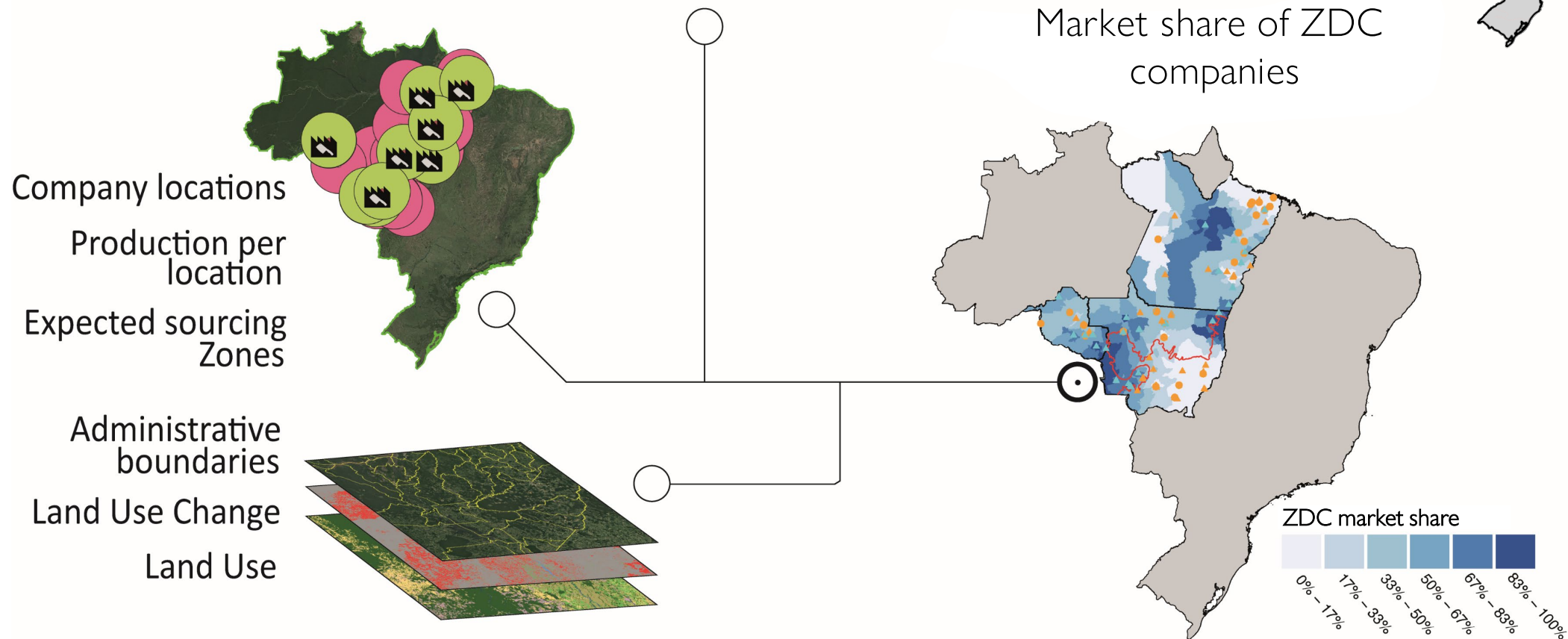
Scale: municipality
 Region: PA, RO, MT
 Period: 2010-2018

Company commitments

Company	Year introduced	Region	Scope	Cut-off for deforestation
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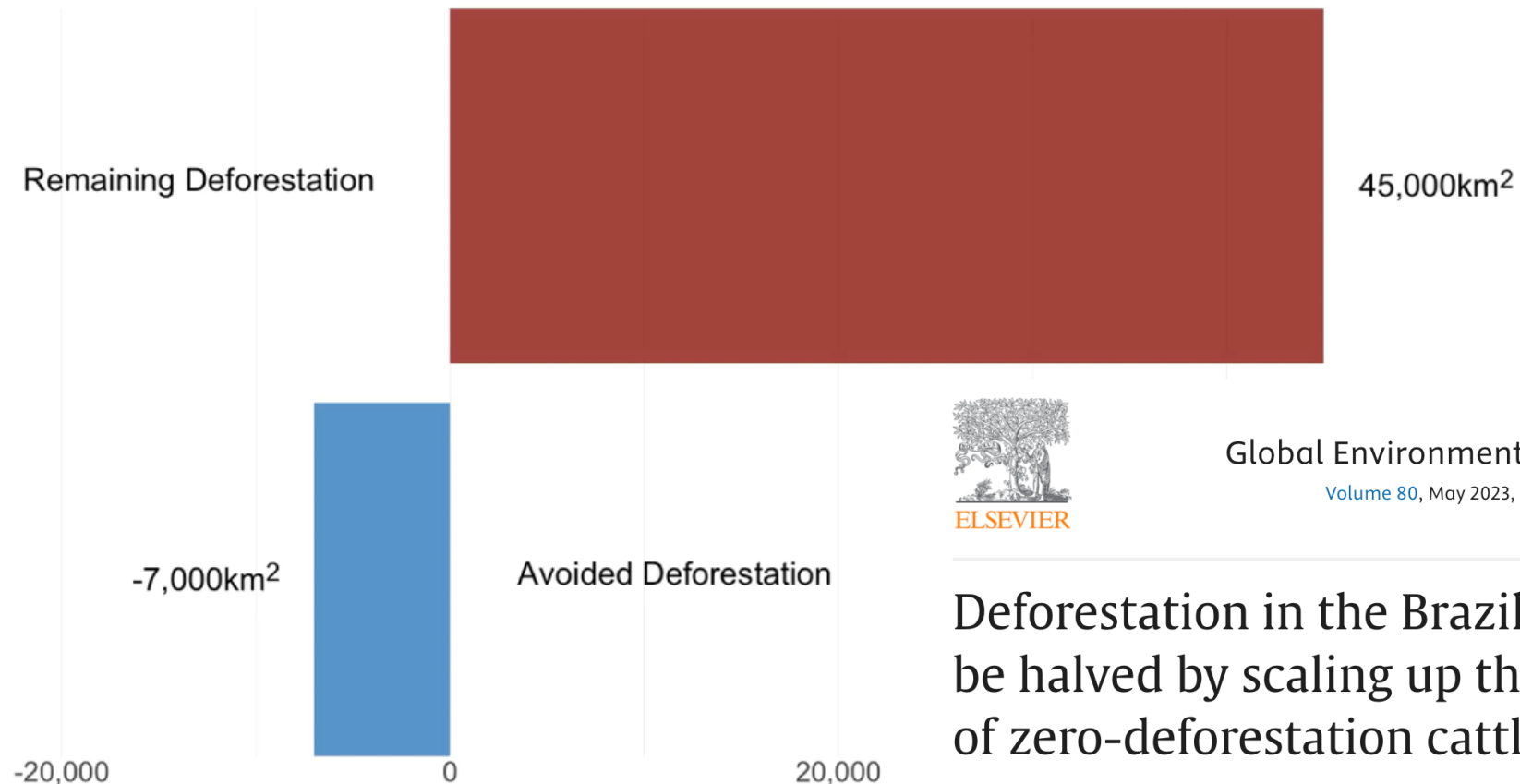
Market share of ZDC companies



High ZDC market share reduced deforestation

Scale: municipality
Region: PA, RO, MT
Period: 2010-2018

% change deforestation associated with ZDCs: **observed**



Global Environmental Change

Volume 80, May 2023, 102671



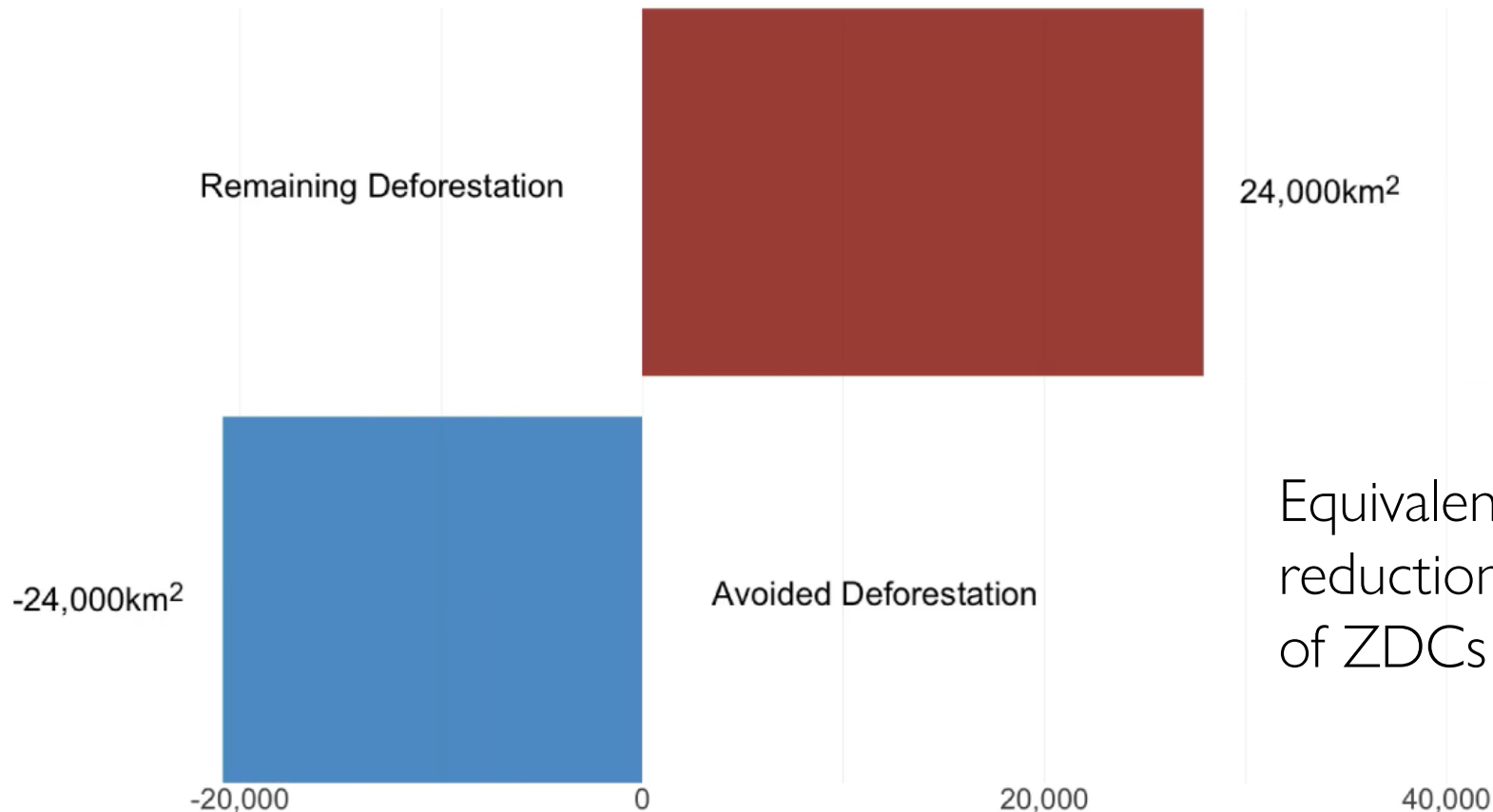
Deforestation in the Brazilian Amazon could be halved by scaling up the implementation of zero-deforestation cattle commitments

Samuel A. Levy^{a b}  , Federico Cammelli^a, Jacob Munger^{c d}, Holly K. Gibbs^{c d}, Rachael D. Garrett^{a e}

High ZDC market share reduced deforestation

Scale: municipality
Region: PA, RO, MT
Period: 2010-2018

% change deforestation associated with ZDCs: had all companies signed an effective ZDC



Equivalent to a **50 ± 28%** reduction in deforestation as a result of ZDCs over study period

Recap & Discussion

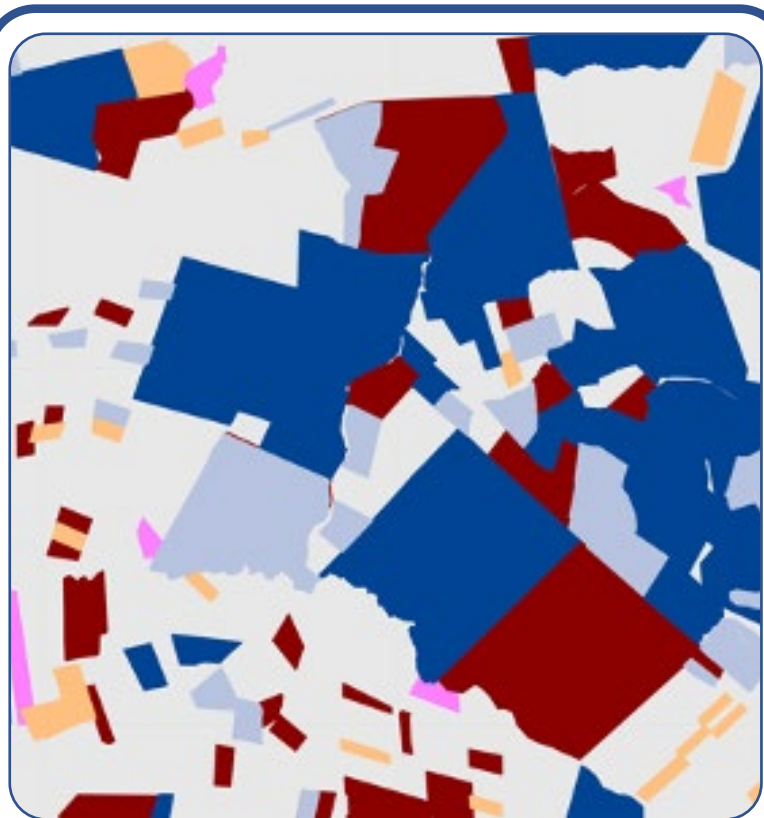


Summary of findings

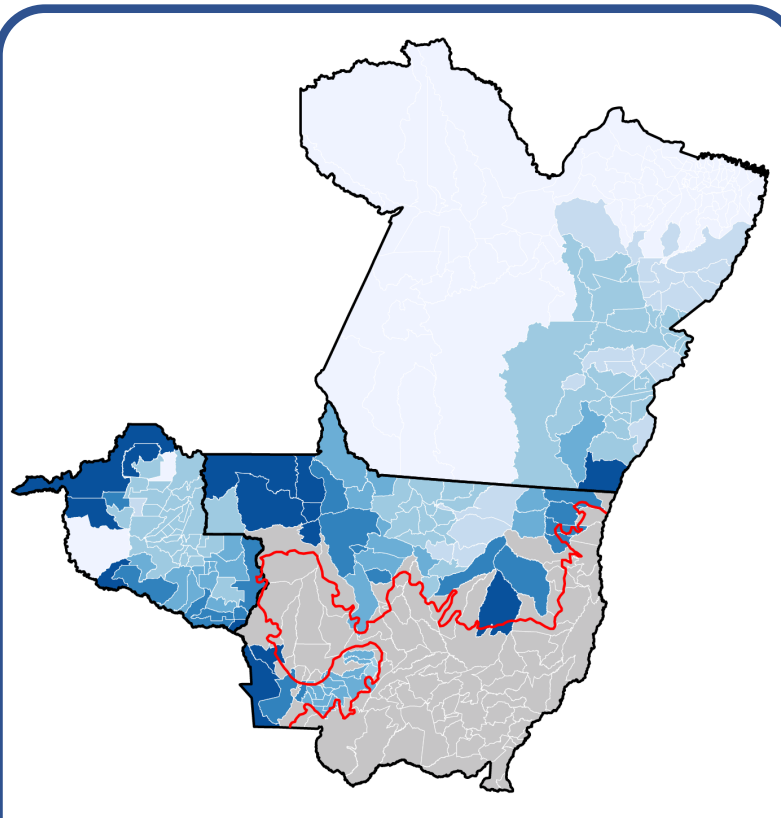


Summary of methodological & theoretical contributions

Two novel data sets

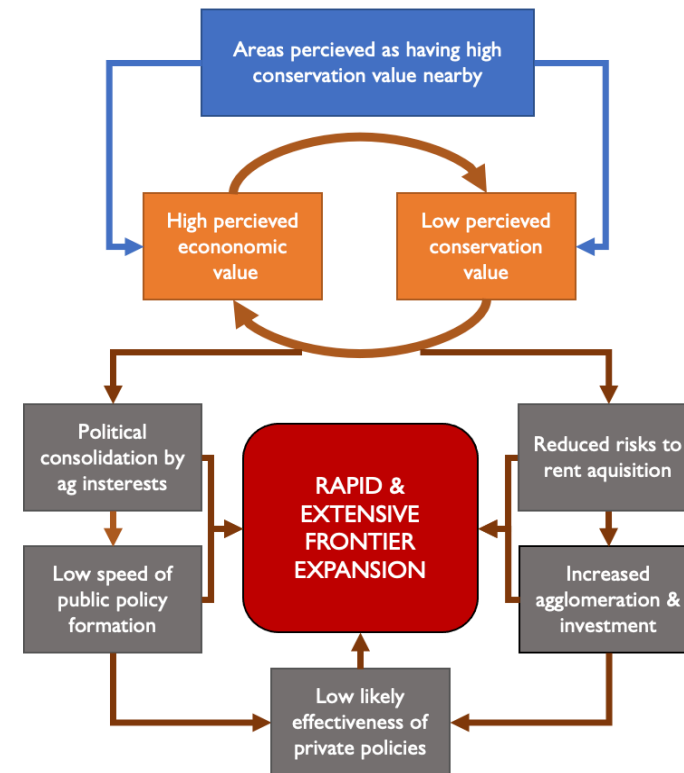


Property-level dataset of ZDC treatment & supply chain tier over space & time



Municipal-level dataset of degree of ZDC exposure over space & time

One theoretical framework



Operationalized sacrifice zone concept & incorporated within frontier theory

Uptake & Engagement

Results from this project have been presented/discussed with:

- Brazilian government organizations (Embrapa, MPF, state/municipal environmental officials)
- Industry organizations (European Roundtable for Beef Sustainability)
- Key NGOs (Imazon, Rainforest Alliance)
- Cattle companies (JBS, Fortefrigo)
- Public media (Swissinfo, Bloomberg, Mongabay & others)

Progress towards addressing loopholes:

- Harmonization of public & private ZDCs in Brazil
- Improved indirect supplier inclusion in ZDCs

Thanks!

Involved institutions:



Funding:

