

Portuguese Colonial Land Grants in Brazil: Long-term Effects on Inequality and Economic Development

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Feedback

1. **Data:** Best way to connect the land grants to the identification.
2. **Identification:** Any other ways to combine what I am presenting today
3. **Results + Motivation:** Plenty of null results (reduced form) - how does that fit into the story/paper?

Background and Motivation

- Inequality in access to land is a key issue in Brazil.
 - “**Brazil has one of the highest levels of inequality of land distribution in the world [...] An estimated 1% of the population owns 45% of all land in Brazil.**” ([USAID, 2016](#))

Background and Motivation

- Inequality in access to land is a key issue in Brazil.
 - “**Brazil has one of the highest levels of inequality of land distribution in the world [...] An estimated 1% of the population owns 45% of all land in Brazil.**” ([USAID, 2016](#))
 - “The agrarian problem is one of the most serious problems [Brazil] has, because of the great concentration of land ownership and the low level of utilization by the large and medium property owners” ([Oliveira Andrade, 1980](#), p. 1)

Research Question

- How much of economic development and inequality can be traced to historical land grants in Brazil?
 - Today I will focus on possible first channels.

Research Question

- How much of economic development and inequality can be traced to historical land grants in Brazil?
 - Today I will focus on possible first channels.
- Identification:
 - Exploit a 1701 Royal Decree that banned livestock grazing within 80km of the coast of Brazil.
 - Created a separation between where the land grants for livestock could be assigned.

Contribution

- Understanding the historical effects of land distribution and usage in Brazil.
 - Americas: [Wigton-Jones, 2020](#) (JEG), [Sellars et al., 2018](#) (JDE), [C. Smith, 2023](#) (WP)
 - India and Africa: [Banerjee et al., 2005](#) (AER)
- Understand the persistent effects of colonial Brazil's economic structure on the present.
 - Institutional and Natural Endowments: [Acemoglu et al., 2001](#) (AER), [Sokoloff et al., 2000](#) (JEP).
 - [Naritomi et al., 2012](#) (JEH), [Musacchio et al., 2014](#) (JEH), [Laudares et al., 2022](#) (WP).

Outline

1. Background
2. Data
3. Identification Strategy
4. Channels
5. Results
6. Discussion

Background

- Goal was to encourage Portuguese settlement of Brazil.
- One of the few ways to have access to land in colonial Brazil and given to people who could afford to develop the land ([T. L. Smith, 1944](#); [Dean, 1971](#)).
- People without direct access to it were often marginalized ([Simonsen, 2005](#)).
- Lasted until 1822.
- Historical and anecdotal evidence of the land grants having permanent effects in Brazilian economic structure:
 - Early studies argued it led to the development of the “**economic aristocracy of the colonial society**” and the “**principal cause of the [large estates]**” in Brazil ([Lima, 2002](#), p. 36; [Costa Porto, 1979](#), p. 48).

Data

- Land Grant Locations:
 - Information on the land grants from the [Sesmarias of the Luso-Brazilian Empire Database \[Novel Data\]](#)
 - Added the state of Bahia, currently in progress for March to finish Sao Paulo and Minas Gerais. [Map](#)
- Check whether they had an effect in the past:
 - 1872 Brazilian Census [[Novel Data at a Finer Geographical Level](#)] [Parishes](#)
- Present-Day Effects on Land Usage (10 x 10km Grid)
 - 1985 LandSat data from MapBiomass
- Present-Day Effects on Land Tenure (1995 Municipalities)
 - 1995 Brazilian Agricultural Census

Identification Strategy

Coastal Ban on Livestock

- In 1701, the Portuguese Crown enacted a ban on cattle ranching within 80km of the coast ([Fausto et al., 2014](#), p .40; [Simonsen, 2005](#), p .198; [Bethell, 1984](#), p .460).
 - Goal was to prevent grazing on coastal farms.

Identification Strategy

Coastal Ban on Livestock

- In 1701, the Portuguese Crown enacted a ban on cattle ranching within 80km of the coast ([Fausto et al., 2014](#), p .40; [Simonsen, 2005](#), p .198; [Bethell, 1984](#), p .460).
 - Goal was to prevent grazing on coastal farms.
- “Landholding in the [interior] was truly extensive [...] The [land grants] on which cattle ranches were established sometimes exceeded hundreds of thousands of acres” ([Bethell, 1984](#))
- “Extensive cattle raising, with open grazing, did not require much attention or labor. For that reason, the number of slaves in the region was small” ([Oliveira Andrade, 1980](#), p. 113)

Channels

	Within 80 km	Past 80 km
Land Grants	No Livestock	Either Crops or Livestock
Labor	More Human Capital Intensive Focused on Agriculture	Less Human Capital Intensive Focused on Livestock
Demographics	More Slavery	Less Slavery
Land Usage	Smaller More Productive	Larger Lands Poorer Utilization Lower Land Security

Identification Strategy

Coastal Ban on Livestock

- Regression Discontinuity design exploiting this 80km cutoff.

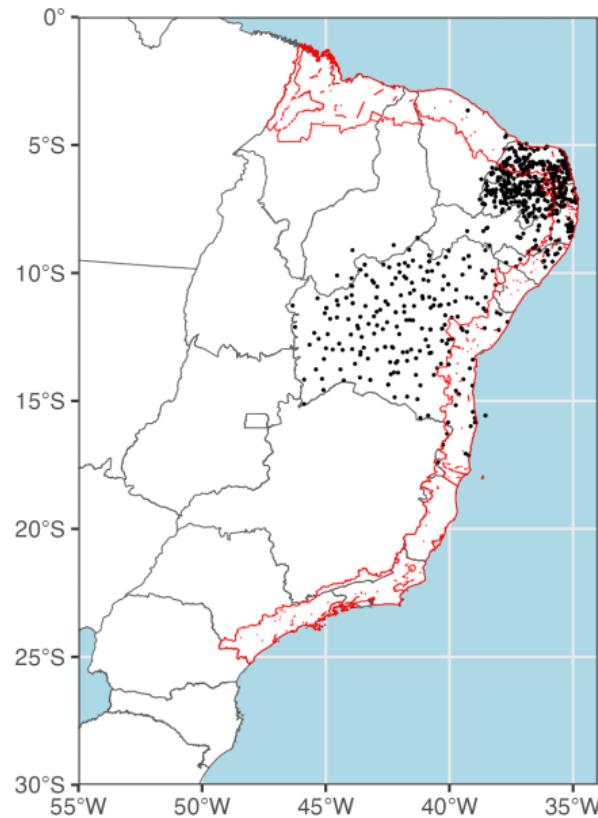
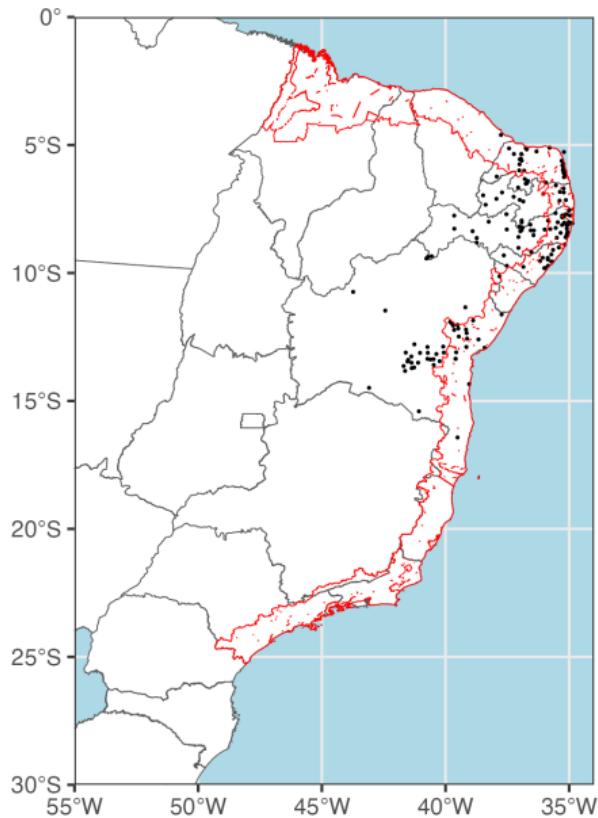
$$Y_{m,s} = \beta \cdot CoastDist_{m,s} + f(D_{m,s}) + \mu_s + \epsilon_{m,s} \quad (1)$$

- Descriptive OLS to distinguish between the border effects vs. more general effects.
 - Also shows evidence of selection and bias.

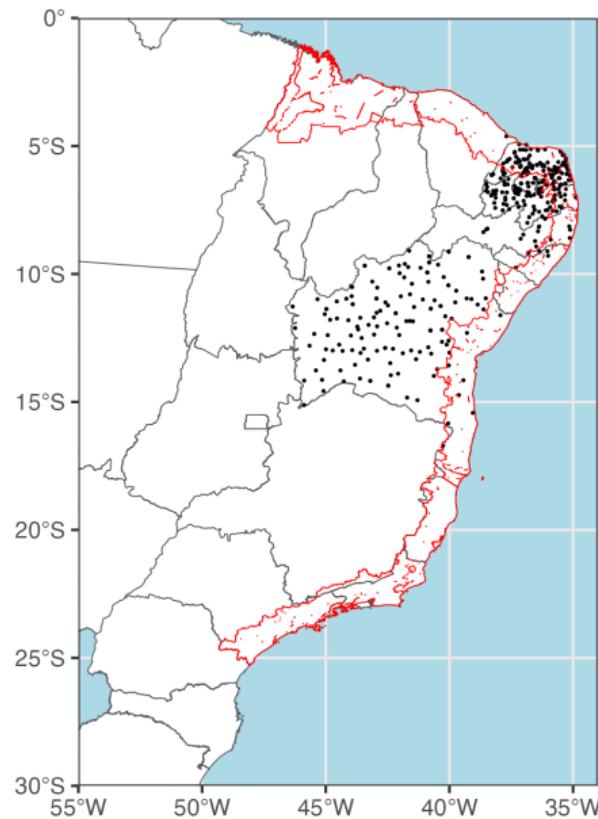
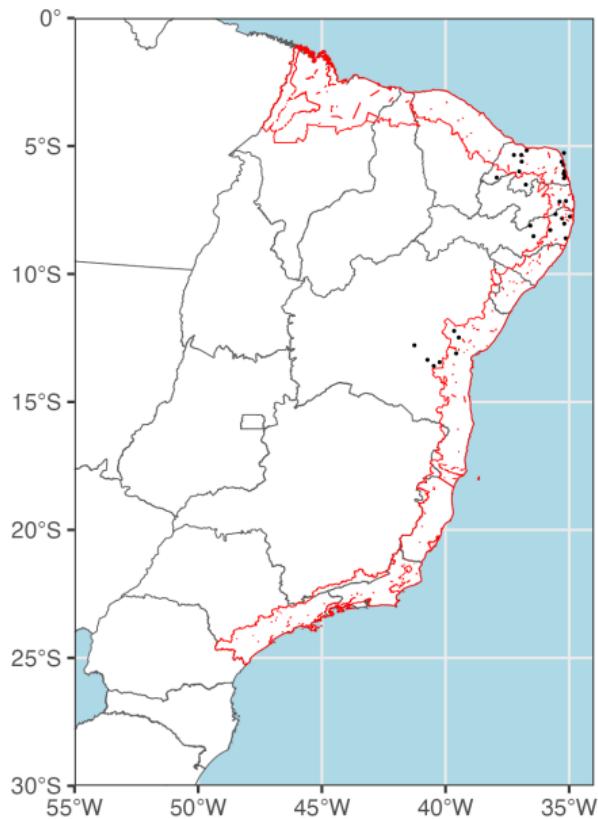
$$Y_{m,s} = \gamma \cdot Past80km_{m,s} + \mu_s + \epsilon_{m,s} \quad (2)$$

- Identify effects on demographics and labor (1872), land usage (1985 and 1995).

Distribution of Land Grants pre- and post- 1701



Distribution of Cattle Land Grants pre- and post- 1701



1872 Census - RD vs. OLS

Demographics

	Enslaved (%)	White (%)	Free Black (%)
<i>Panel A (RDD)</i>			
Past 80 km	-1.162 (3.108)	-0.703 (4.402)	0.443 (2.962)
Kernel Bandwidth	Triangular [35.7,35.7]	Triangular [26.8,26.8]	Triangular [19.7,19.7]
N	[73,73]	[57,48]	[40,29]
<i>Panel B (OLS)</i>			
Past 80 km	-2.512*** (0.863)	1.890 (1.216)	-2.730*** (0.856)
N	815	815	815
R ²	0.24	0.51	0.41
Control Mean	13.3	38.5	15.3

* p < 0.1, ** p < 0.05, *** p < 0.01

Enslaved White Free Black

1872 Census RD vs. OLS

Descriptive OLS - Labor

	Crops (%)	Ranching (%)	Industry (%)
<i>Panel A (RDD)</i>			
Past 80 km	-6.926 (6.916)	0.052 (0.653)	-0.363 (0.306)
Kernel Bandwidth	Triangular [29.4,29.4]	Triangular [28,28]	Triangular [35.9,35.9]
N	[60,59]	[59,56]	[114,83]
<i>Panel B (OLS)</i>			
Past 80 km	0.512 (1.698)	1.507*** (0.318)	-0.663*** (0.165)
N	815	815	815
R ²	0.13	0.19	0.29
Control Mean	32.4	0.8	1.9

* p < 0.1, ** p < 0.05, *** p < 0.01

1985 LandSat RD vs. OLS

Land Usage

	Natural Land (%)	Artificial Pasture (%)	Sugarcane (%)
<i>Panel A (RDD)</i>			
Past 80 km	0.569 (2.808)	0.755 (3.608)	0.036 (0.140)
Kernel Bandwidth	Triangular [31.4,31.4]	Triangular [25.6,25.6]	Triangular [22.5,22.5]
N	[436,413]	[347,341]	[313,295]
<i>Panel B (OLS)</i>			
Past 80 km	28.396*** (0.759)	-9.068*** (0.899)	-3.058*** (0.233)
N	6747	6747	6747
R ²	0.20	0.04	0.23
Control Mean	31.5	36.0	3.8

* p < 0.1, ** p < 0.05, *** p < 0.01

Natural

Pasture

Sugarcane

1995 Agricultural Census RD vs. OLS

Agricultural Land Usage

	Livestock (%)	Occupied (%)	Over 2000ha (%)
<i>Panel A (RDD)</i>			
Past 80 km	6.229* (3.632)	7.474 (5.835)	-3.287 (2.102)
Kernel Bandwidth	Triangular [25.1,25.1]	Triangular [16.7,16.7]	Triangular [27.1,27.1]
N	[171,162]	[107,104]	[190,181]
<i>Panel B (OLS)</i>			
Past 80 km	9.404*** (2.111)	2.485 (1.561)	-1.870*** (0.725)
N	1790	1790	1790
R ²	0.04	0.00	0.05
Control Mean	40.4	5.1	9.8

* p < 0.1, ** p < 0.05, *** p < 0.01

Discussion

1. Overall, not much happening at the border (RD).
2. Null results $\not\Rightarrow$ No effect of the land grants.
3. Other ways to disentangle/combine the land grants + this 80 km cutoff?

Next Steps

- Incorporate the feedback today.
- Incorporate 1970-2010 census microdata for future methods.
- Wrap up the data for Minas and Sao Paulo + start Ceara.

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History/Background

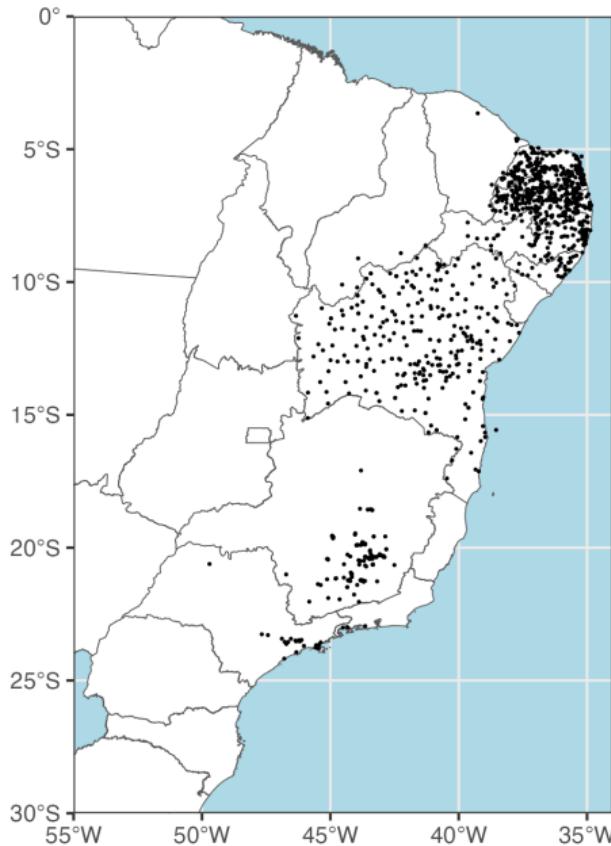
Request Process

- Petitioner submits a letter for an unoccupied land detailing their qualifications (captain, governor, etc.)
- Governor reads it, and if accepted returns back a letter with the requirements for the petitioner to satisfy.
- Five years to develop the land
- If successful, upon an inspection, land was transferred to the *sesmeiro*.
- Able to sell, pass down as inheritance, etc.

Current Land Grant Data Status

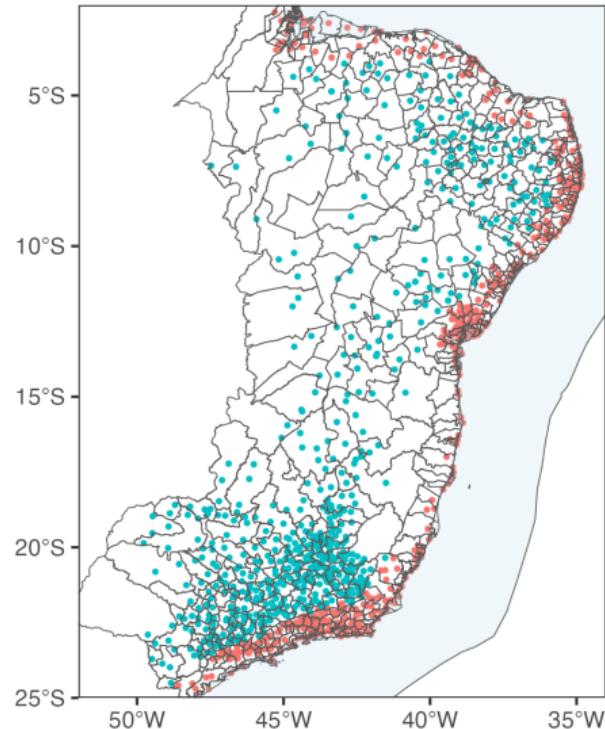
[Back](#)

- Timeline is to have both Minas and Sao Paulo by March.



1872 Parish Level Information

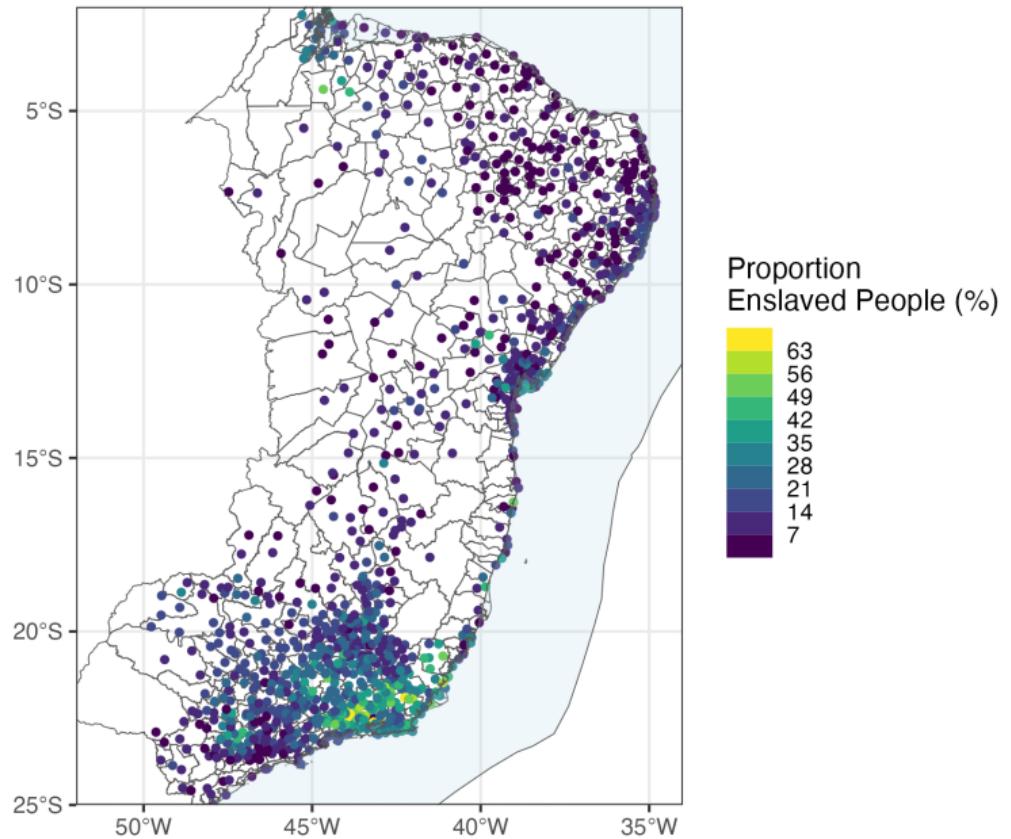
[New Data] [Back](#)



More than 80km: • No • Yes

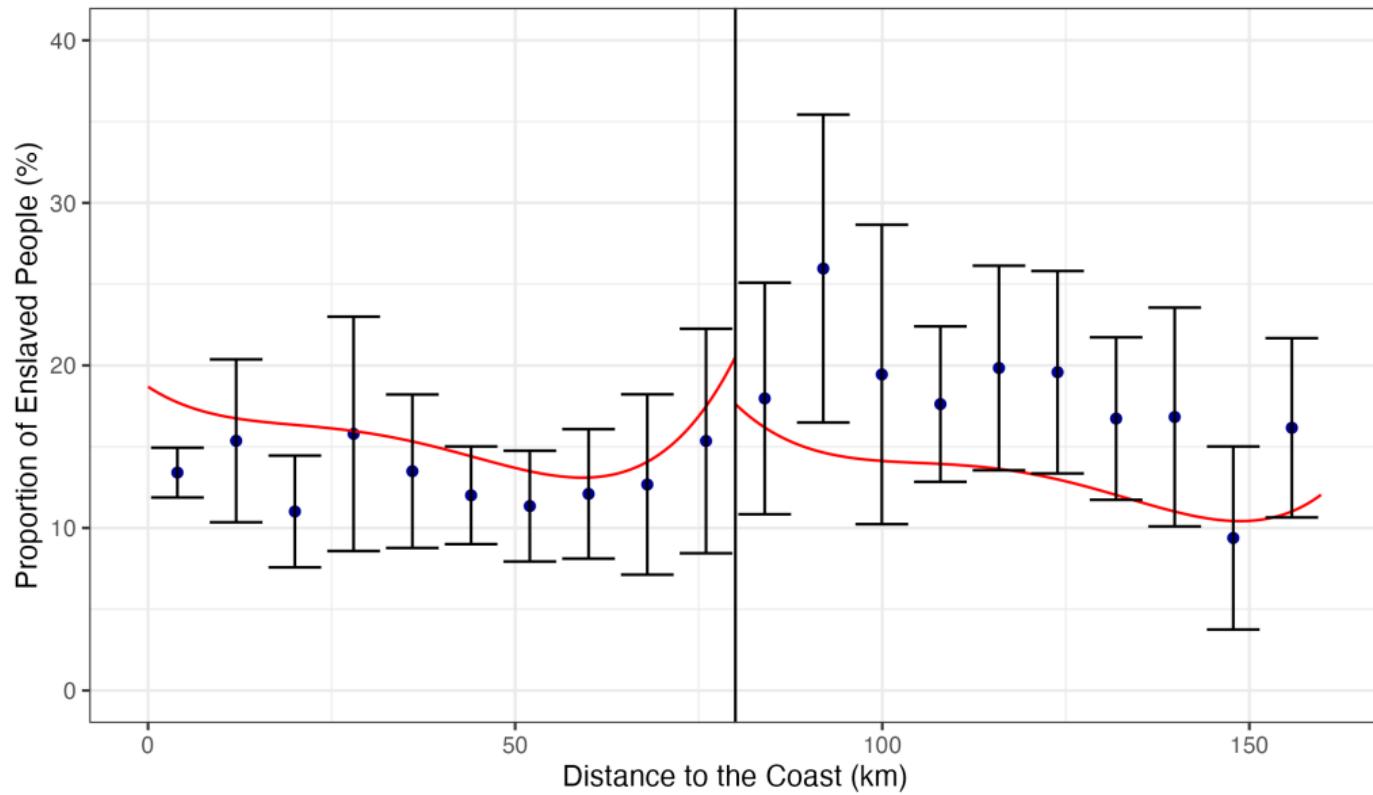
1872 Results

Slavery



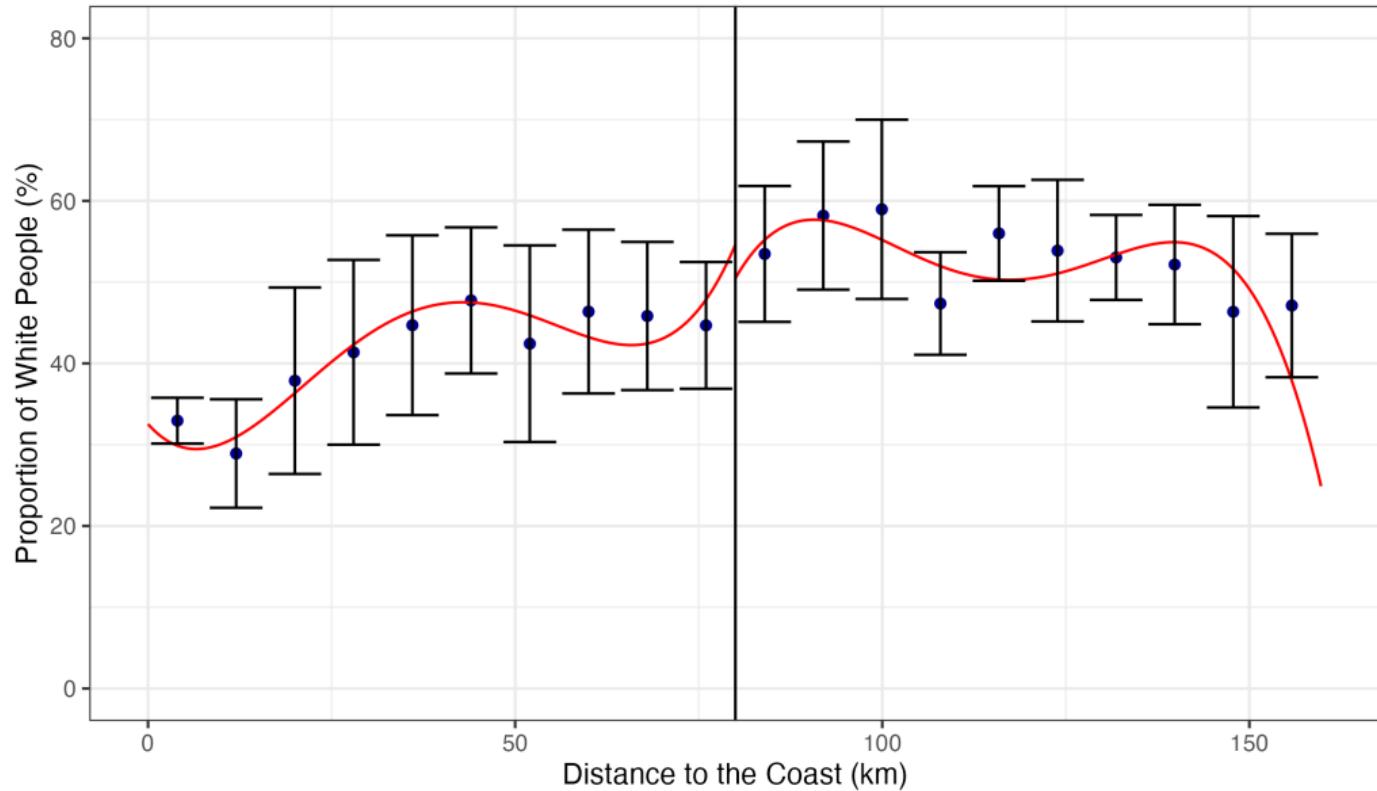
1872 Results

Slavery [Back](#)



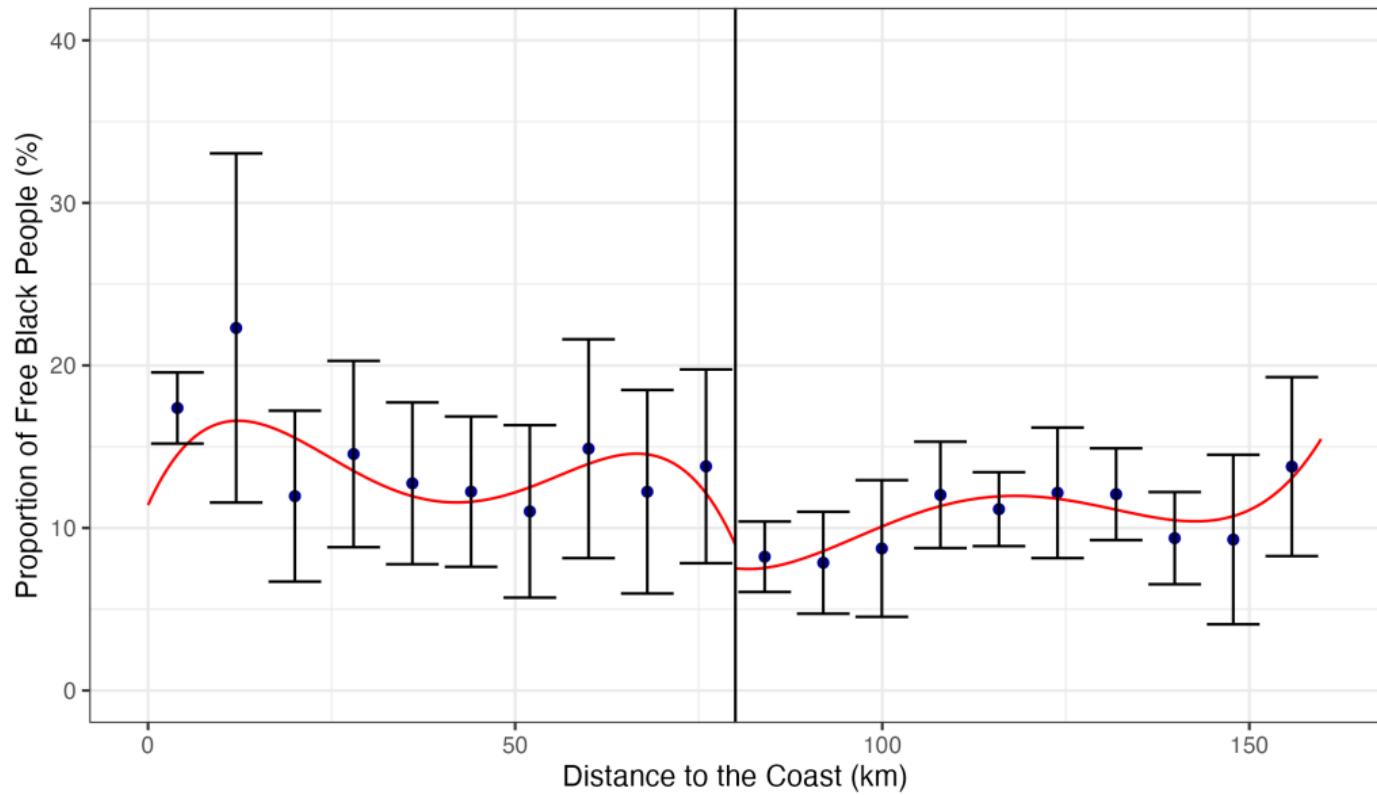
1872 Results

White Population [Back](#)



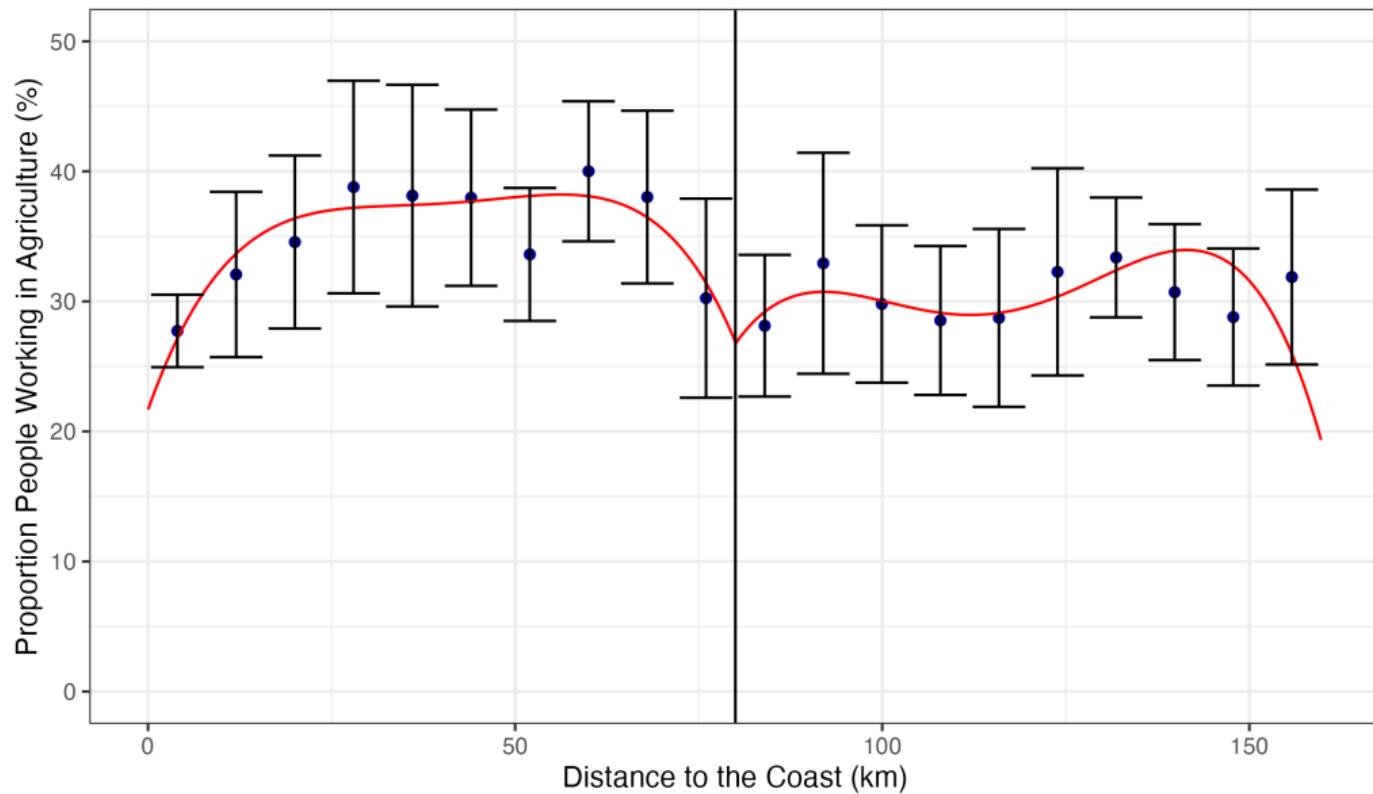
1872 Results

Free Black Population [Back](#)



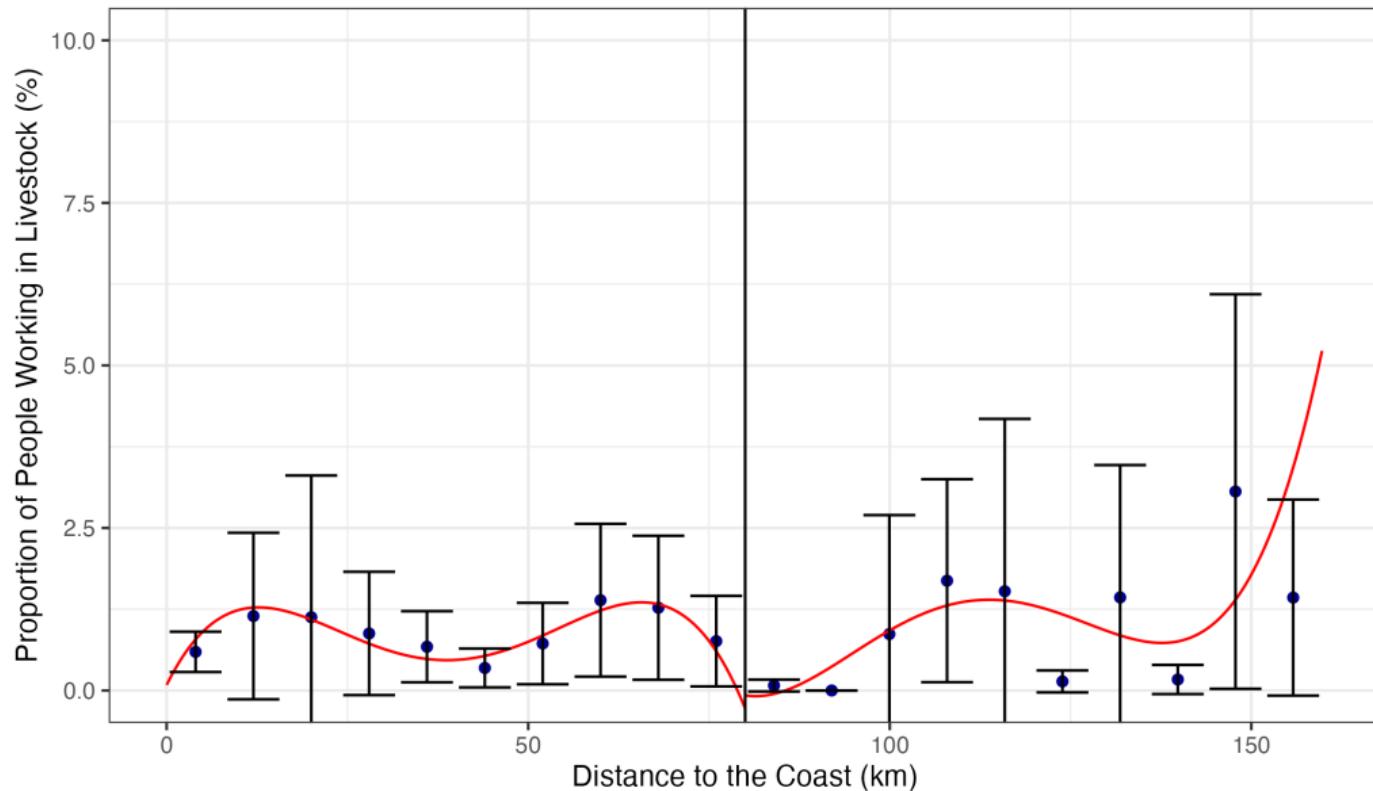
1872 Results

Agriculture [Back](#)



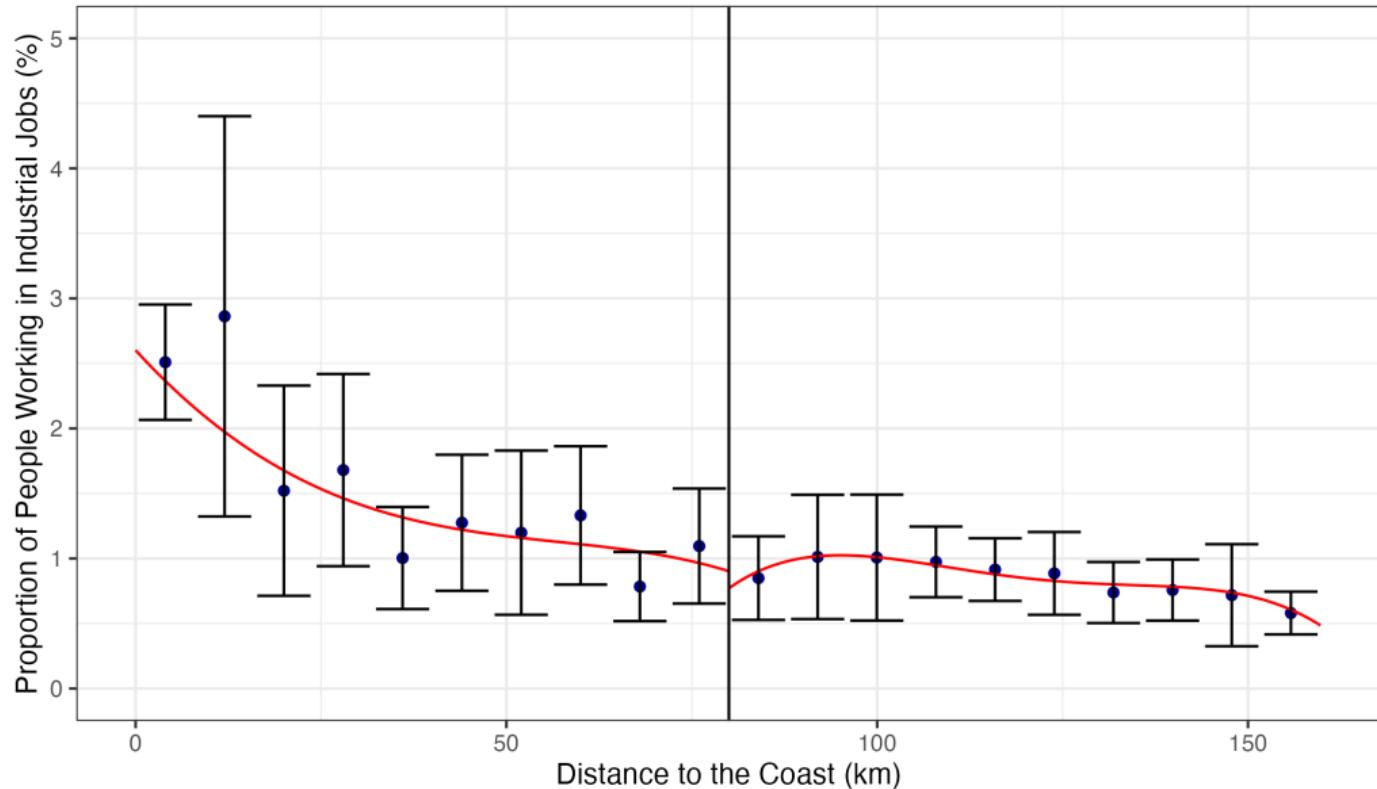
1872 Results

Ranching [Back](#)



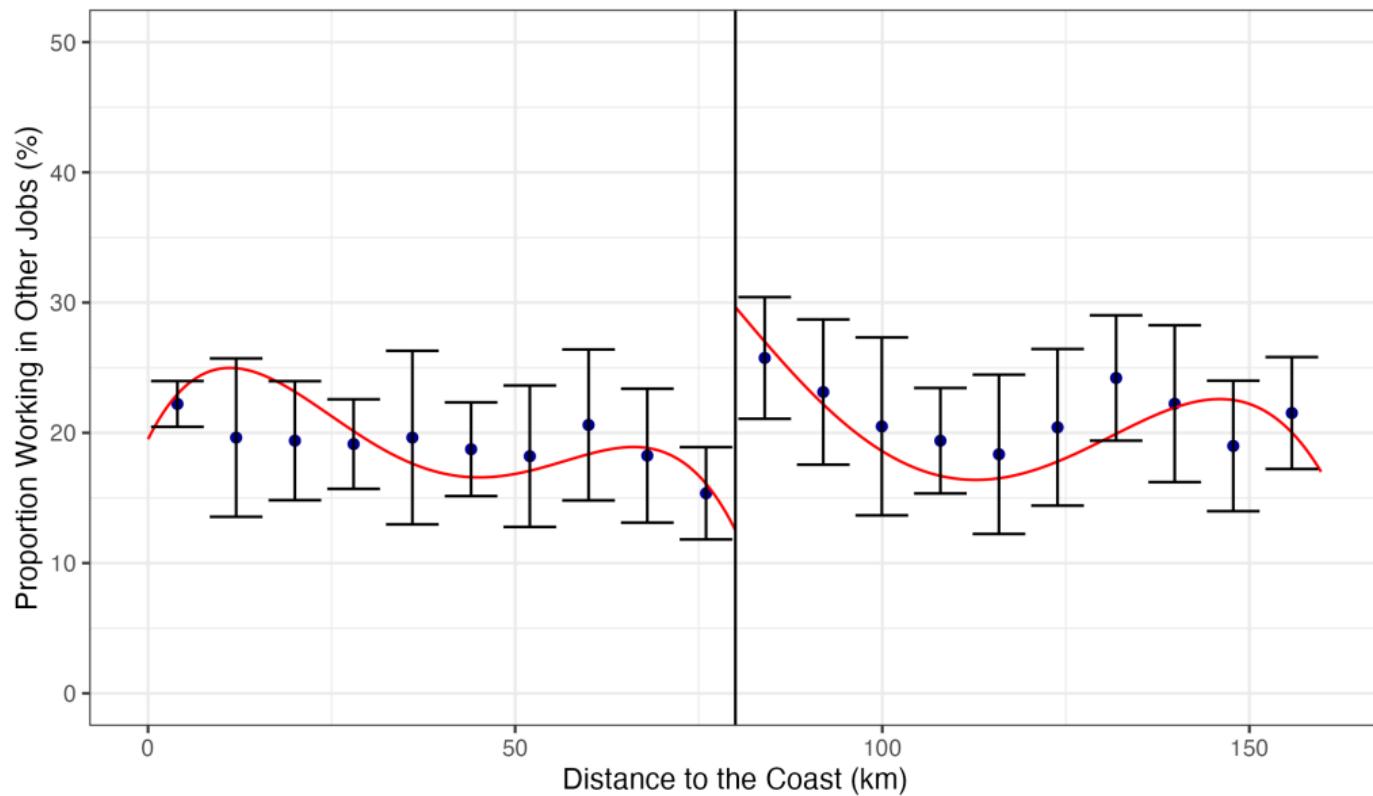
1872 Results

Industry [Back](#)



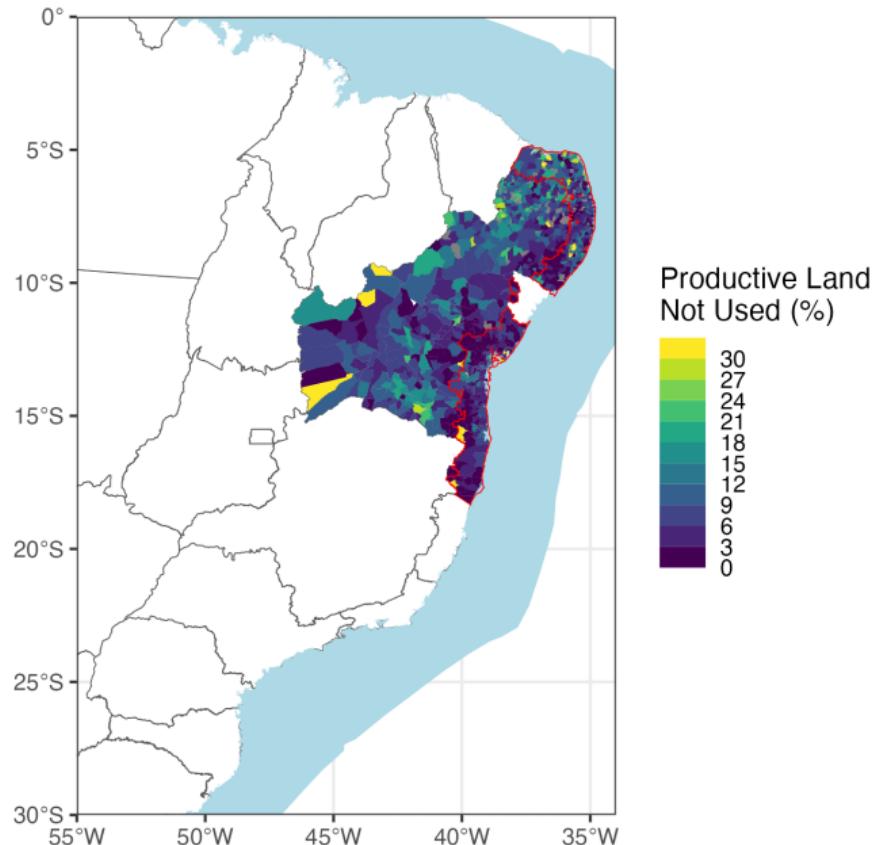
1872 Results

Other Professions



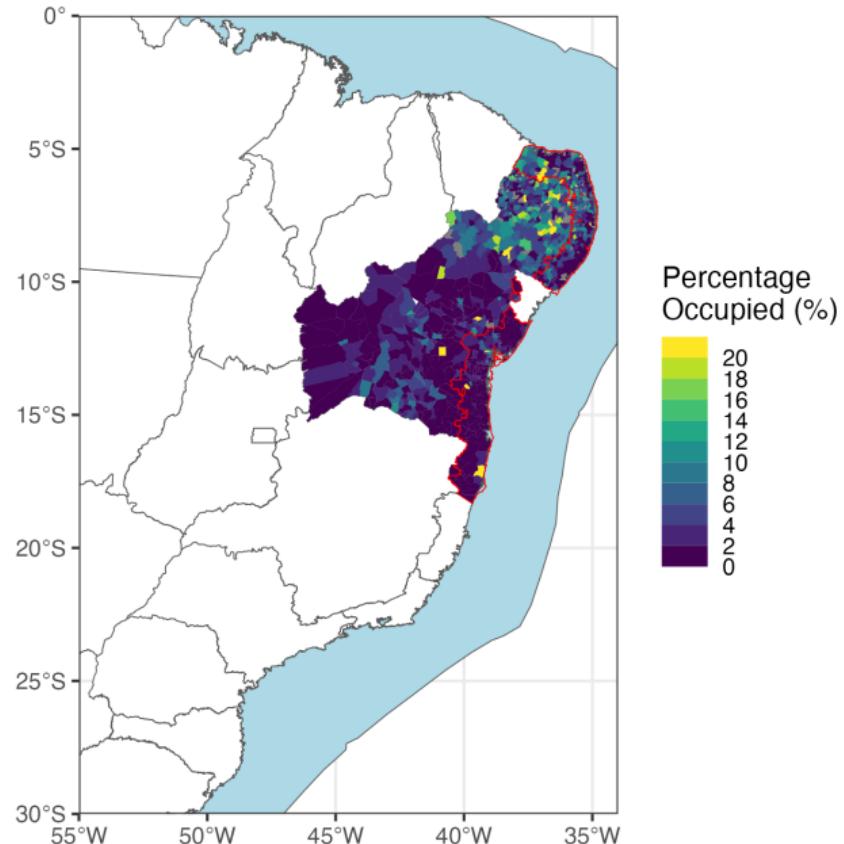
1995 Agricultural Census Results

Productive Land Not Used



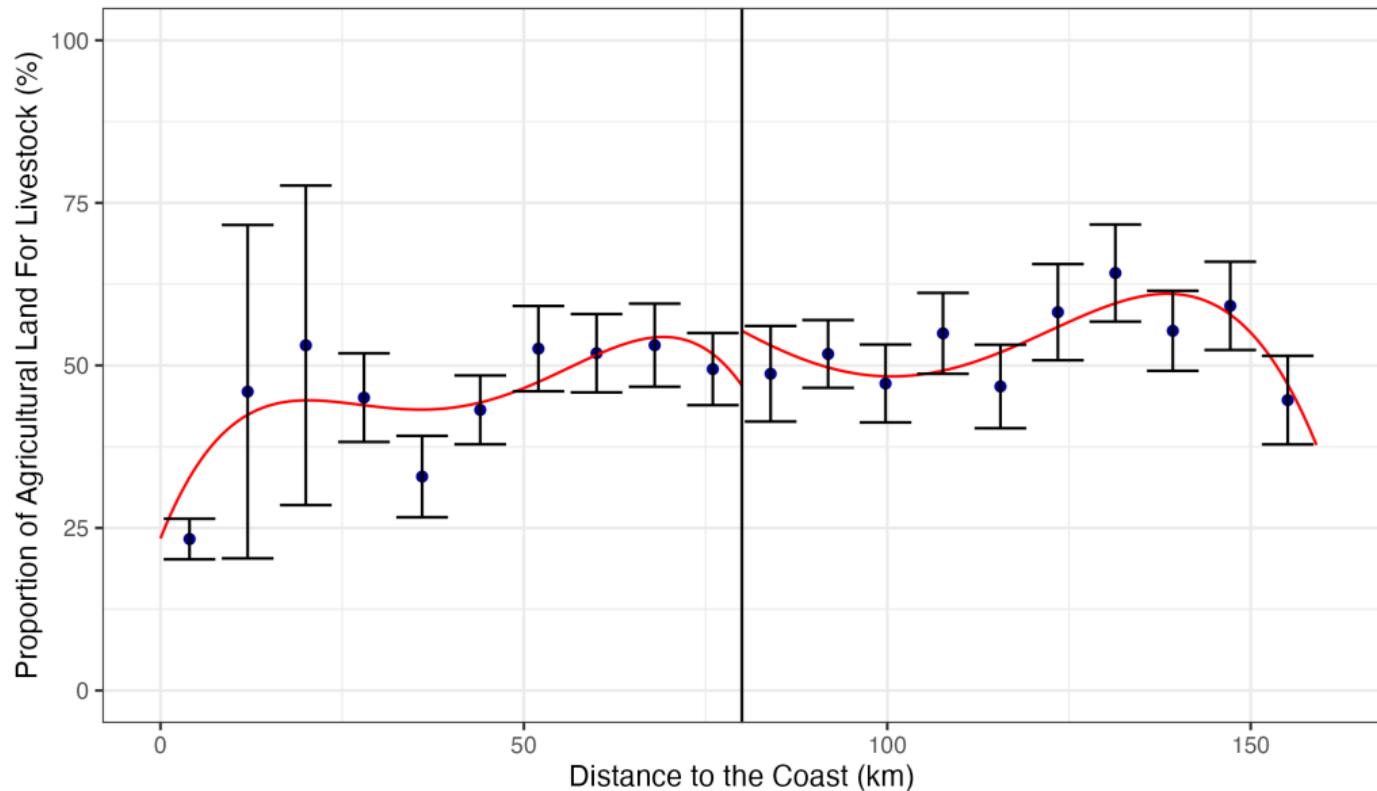
1995 Agricultural Census Results

Occupied Land



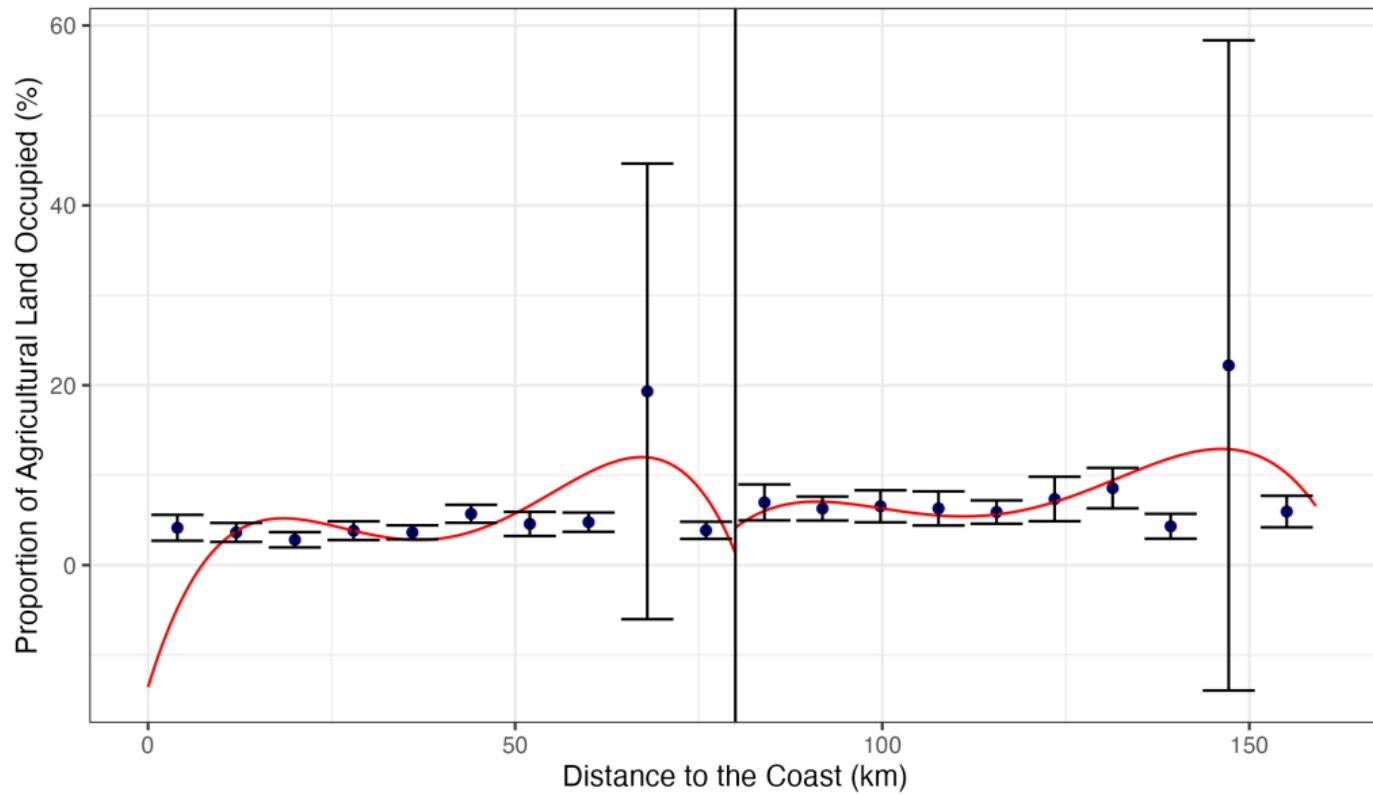
1995 Agricultural Census

Livestock [Back](#)



1995 Agricultural Census

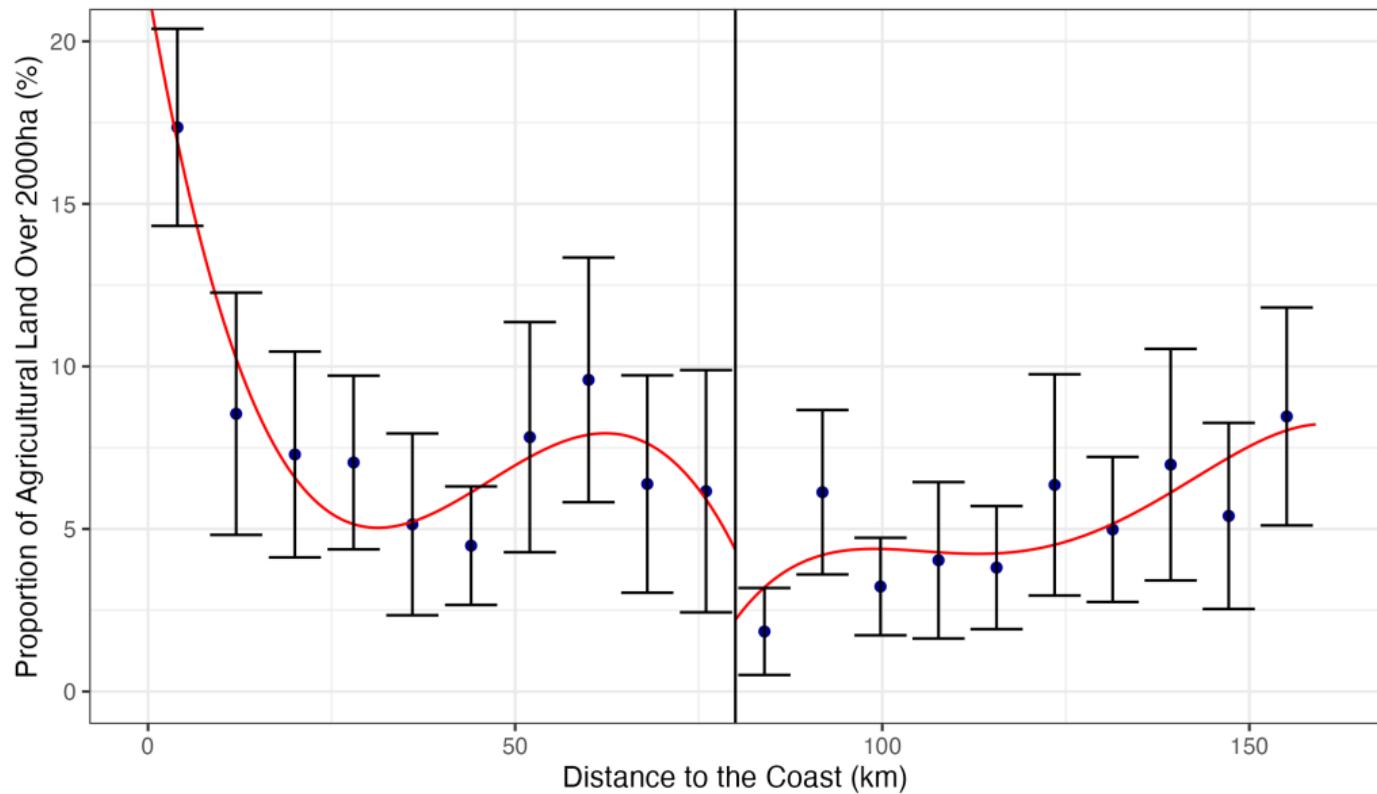
Occupied Land [Back](#)



1995 Agricultural Census

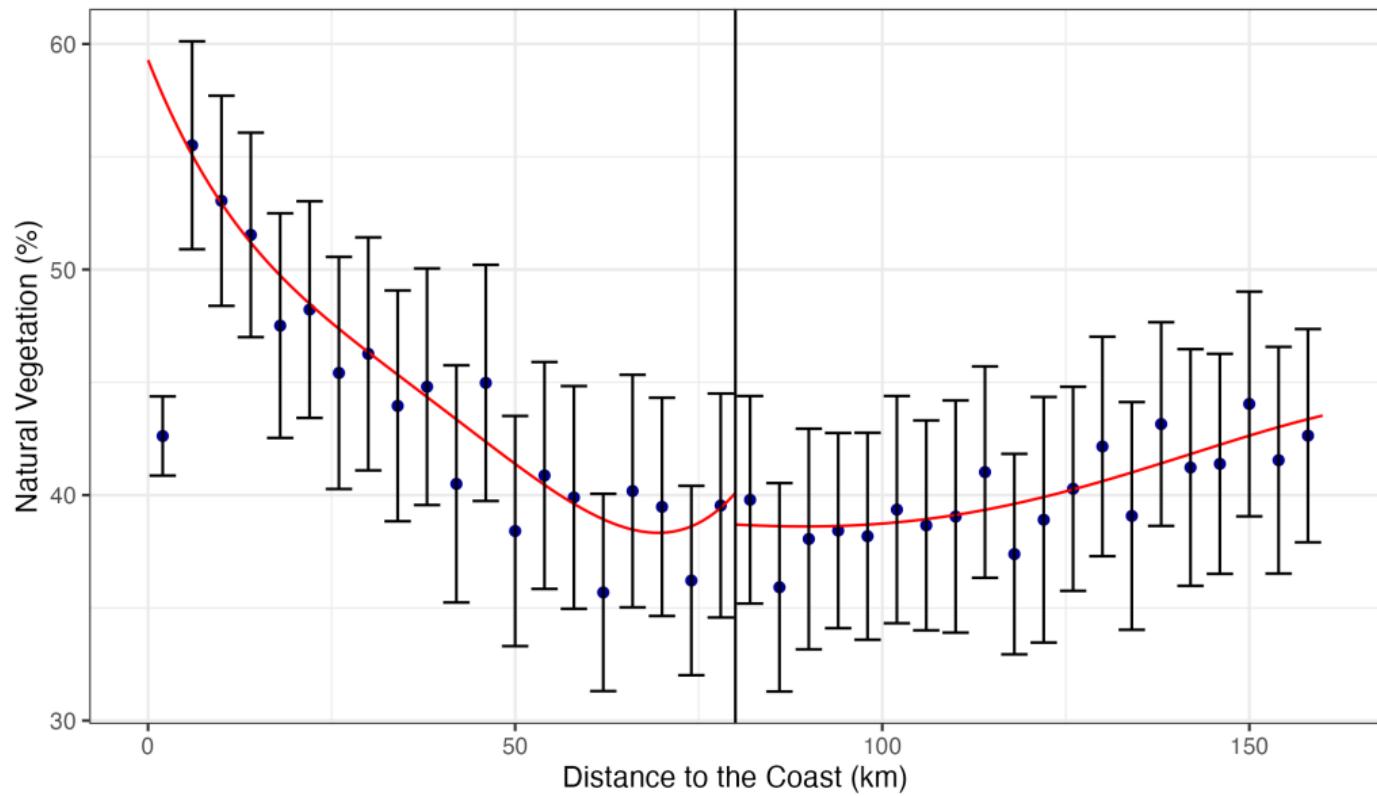
Land Over 2000ha

[Back](#)



1985 LandSat RD

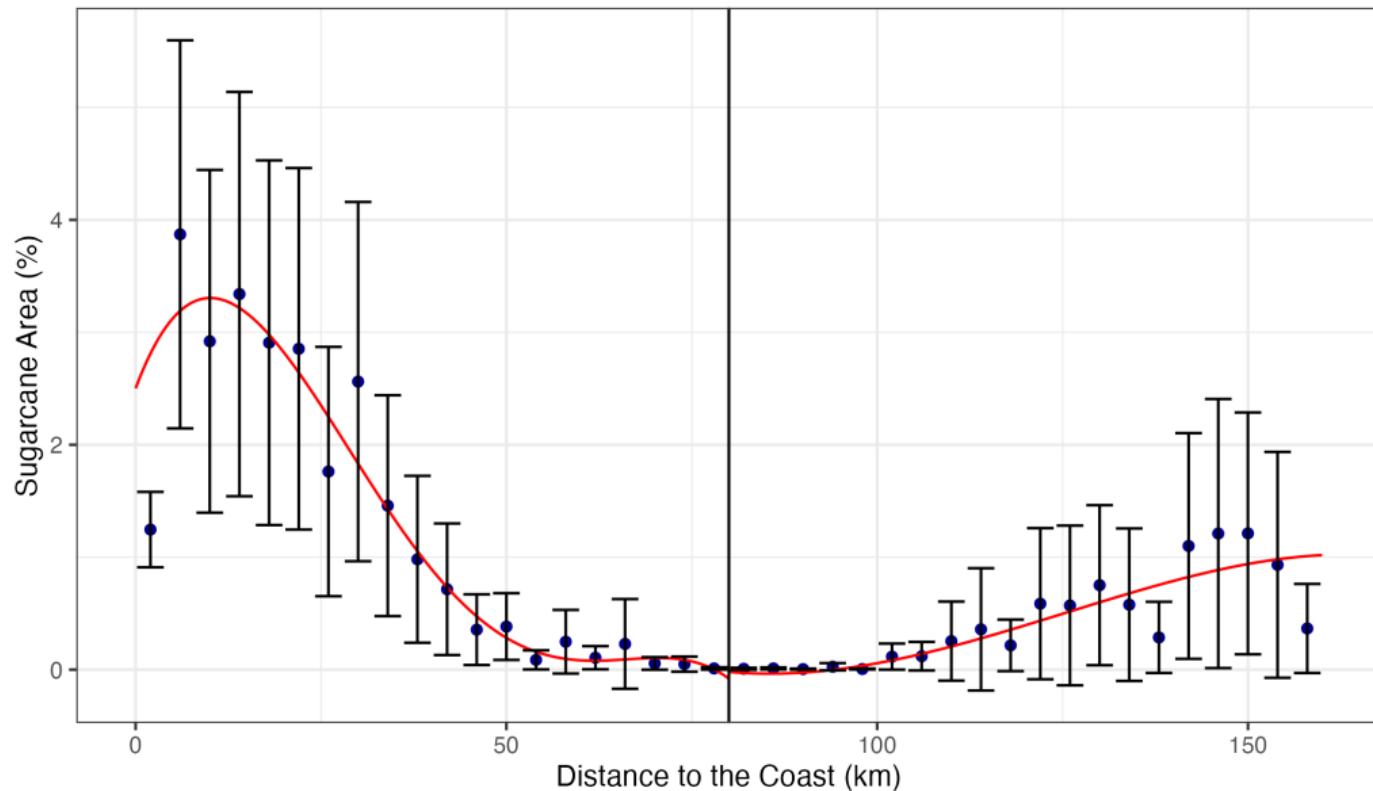
Natural Vegetation [Back](#)



1985 LandSat RD

Area dedicated to sugarcane

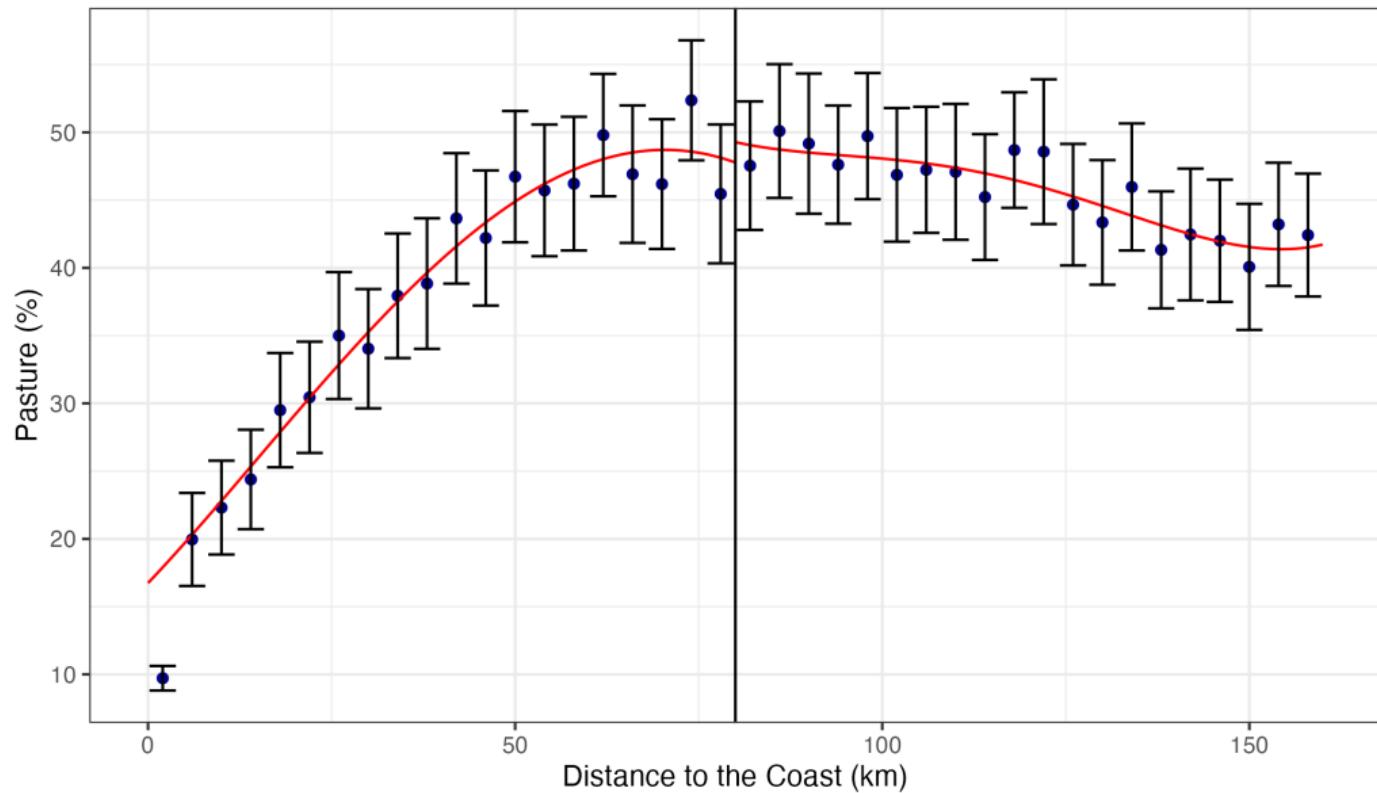
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1985 LandSat RD

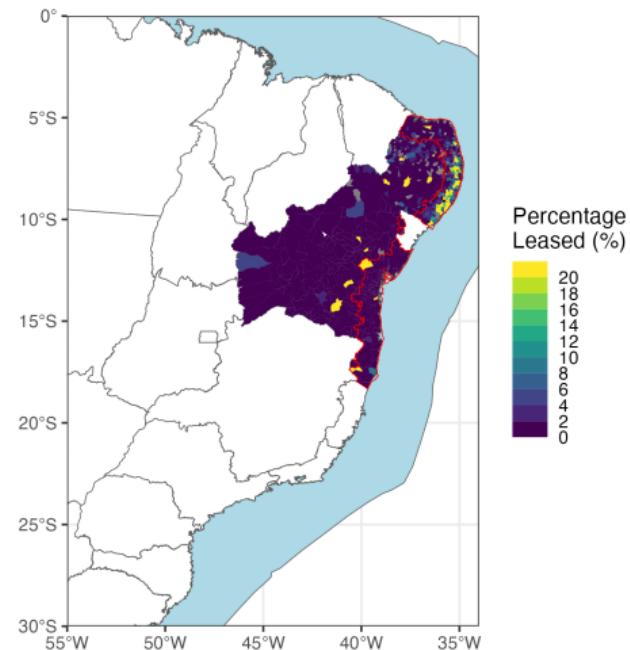
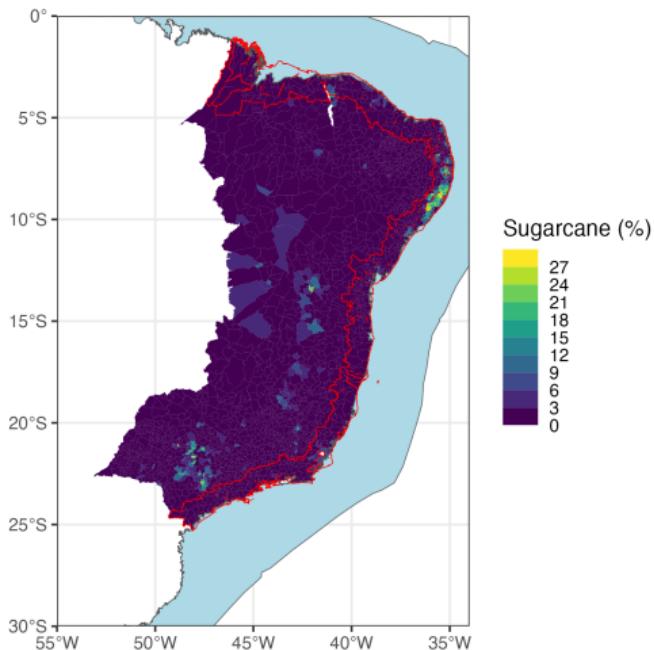
Planted Pasture

[Back](#)



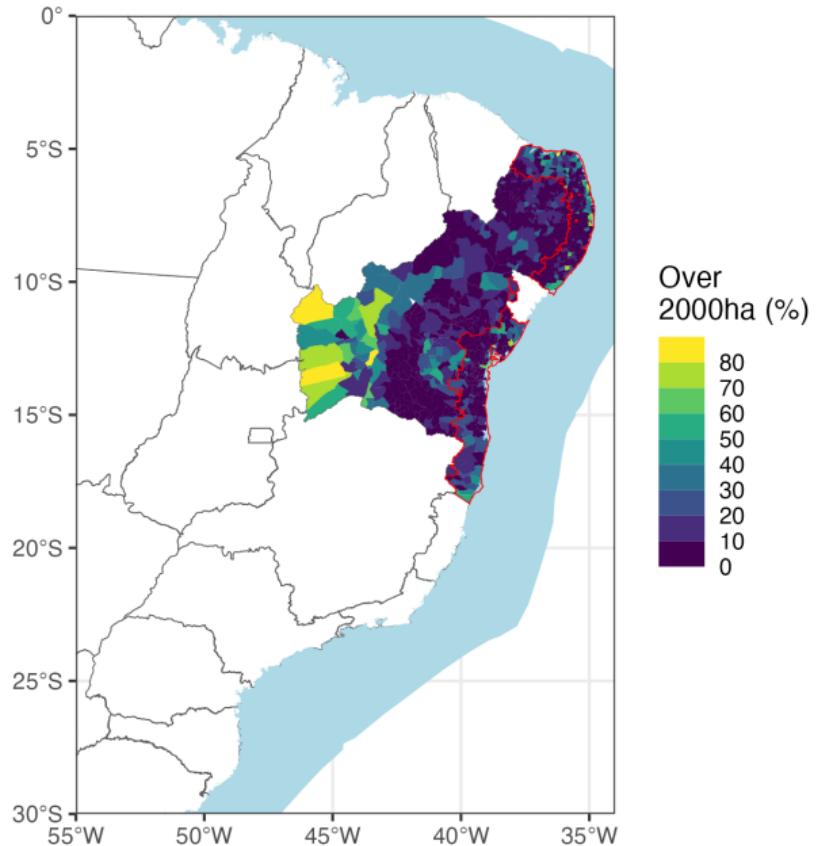
1995 Agricultural Census - 1970 Census

Leased Land and Sugarcane Workers



1995 Agricultural Census

Over 2000 ha



1872 RD vs. OLS

Descriptive OLS - Labor Enslaved

	Agriculture (%)	Industry (%)	Manual (%)	Liberal (%)	Other (%)
<i>Panel A (RDD)</i>					
Past 80 km	-15.311 (13.032)	0.010 (0.009)	-0.595 (1.870)	-0.076** (0.038)	15.549 (10.903)
Kernel Bandwidth	Triangular [29.1,29.1]	Triangular [28.5,28.5]	Triangular [33.6,33.6]	Triangular [43.1,43.1]	Triangular [40.6,40.6]
N	[60,59]	[59,57]	[68,65]	[95,89]	[90,80]
<i>Panel B (OLS)</i>					
Past 80 km	0.078 (2.068)	-0.003 (0.003)	0.899* (0.532)	-0.031 (0.052)	-1.412 (1.758)
N	815	815	815	815	815
R ²	0.24	0.01	0.12	0.02	0.14

* p < 0.1, ** p < 0.05, *** p < 0.01

1872 RD vs. OLS

Descriptive OLS - Labor Free

	Agriculture (%)	Industry (%)	Manual (%)	Liberal (%)	Other (%)
<i>Panel A (RDD)</i>					
Past 80 km	-5.261 (6.771)	-0.629 (0.542)	2.614 (1.811)	-0.557** (0.280)	7.578 (4.726)
Kernel Bandwidth	Triangular [30.9,30.9]	Triangular [34.7,34.7]	Triangular [24.7,24.7]	Triangular [34.3,34.3]	Triangular [28.2,28.2]
N	[61,61]	[69,70]	[52,39]	[69,69]	[59,56]
<i>Panel B (OLS)</i>					
Past 80 km	0.784 (1.720)	-0.808*** (0.195)	0.431 (0.507)	-0.516*** (0.122)	-2.241* (1.255)
N	815	815	815	815	815
R ²	0.14	0.17	0.37	0.11	0.18

* p < 0.1, ** p < 0.05, *** p < 0.01

1985 LandSat RD vs. OLS

Geography

	Slope	Elevation	Caloric Input pre 1500	Caloric Input post 1500	Maximum Sugarcane Output
<i>Panel A (RDD)</i>					
Past 80 km	0.248 (0.372)	7.362 (20.873)	53.591 (170.613)	33.681 (122.499)	10.843 (84.956)
Kernel Bandwidth	Triangular [35.9,35.9]	Triangular [24.4,24.4]	Triangular [23.8,23.8]	Triangular [26.7,26.7]	Triangular [31.4,31.4]
N	[494,473]	[334,326]	[329,318]	[362,360]	[436,413]
<i>Panel B (OLS)</i>					
Past 80 km	-0.427*** (0.068)	398.648*** (4.822)	1578.633*** (39.756)	433.530*** (36.447)	-302.971*** (15.527)
N	6747	6747	6747	6747	6747
R ²	0.02	0.55	0.09	0.02	0.12

* p < 0.1, ** p < 0.05, *** p < 0.01