

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

Vinicius Okada da Silva

The University of Illinois at Urbana-Champaign

What I'm Looking for

- ▶ What's the best way to proceed with the project, given the data and a timeline for graduation.
- ▶ Some of the issues with each identification strategy I've thought about.
 - ▶ Paper itself would not just be one identification but a combination of multiple of them.
- ▶ Possible interesting section to analyze how they were distributed.

Motivation

- ▶ Inequality, in both land and income, is high 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)

Motivation

- ▶ Inequality, in both land and income, is high 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](#))
 - ▶ However, it has been the case for the past century ([Alston et al., 2010](#); [Wigton-Jones, 2020](#))

Research Question

- ▶ How much of economic development and inequality can be traced to colonial institutions?
 - ▶ Goal of this research would analyze the effects of colonial Portuguese land grants (*sesmarias*) on long-term development and inequality in Brazil.

Research Question

- ▶ How much of economic development and inequality can be traced to colonial institutions?
 - ▶ Goal of this research would analyze the effects of colonial Portuguese land grants (*sesmarias*) on long-term development and inequality in Brazil.
- ▶ Proposed Identification:
 - ▶ Exploit **exogenous** variation on where the land grants could be granted during early colonization because of a treaty between Portugal and Spain ([Laudares et al., 2022](#)).
 - ▶ Generate **placebo land grants** and compare the effects with the actual ones ([Dell et al., 2019](#)).
 - ▶ Exploit **variation of soil quality** for different types of production across colonial Brazil ([Wigton-Jones, 2020](#)).

Background

- ▶ Goal was to encourage Portuguese settlement of Brazil.

Background

- ▶ Goal was to encourage Portuguese settlement of Brazil.
- ▶ Lasted until 1822

Background

- ▶ Goal was to encourage Portuguese settlement of Brazil.
- ▶ 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).

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?
 - ▶ Economic Development ⇒ the lands granted were (supposed to be) developed by the owners, leading to the early economic development of an area (possible conflict with extractive institutions though). **[Hard to measure for 1872 though]**

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?
 - ▶ Economic Development ⇒ the lands granted were (supposed to be) developed by the owners, leading to the early economic development of an area (possible conflict with extractive institutions though). **[Hard to measure for 1872 though]**
 - ▶ Land inequality ⇒ only those with sufficient financial conditions could get land grants, and were often granted vast plots of land.

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?
 - ▶ Economic Development ⇒ the lands granted were (supposed to be) developed by the owners, leading to the early economic development of an area (possible conflict with extractive institutions though). **[Hard to measure for 1872 though]**
 - ▶ Land inequality ⇒ only those with sufficient financial conditions could get land grants, and were often granted vast plots of land.
 - ▶ Income inequality ⇒ land was associated with wealth, fewer people with land leads to wealth accumulation.

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?
 - ▶ Economic Development ⇒ the lands granted were (supposed to be) developed by the owners, leading to the early economic development of an area (possible conflict with extractive institutions though). **[Hard to measure for 1872 though]**
 - ▶ Land inequality ⇒ only those with sufficient financial conditions could get land grants, and were often granted vast plots of land.
 - ▶ Income inequality ⇒ land was associated with wealth, fewer people with land leads to wealth accumulation.
 - ▶ Demographic Differences ⇒ Land grants often required African slaves, which could skew the demographics of a location.

Possible Channels

- ▶ What are the long-term economic effects of colonial Portuguese land grants in Brazil?
 - ▶ Economic Development ⇒ the lands granted were (supposed to be) developed by the owners, leading to the early economic development of an area (possible conflict with extractive institutions though). **[Hard to measure for 1872 though]**
 - ▶ Land inequality ⇒ only those with sufficient financial conditions could get land grants, and were often granted vast plots of land.
 - ▶ Income inequality ⇒ land was associated with wealth, fewer people with land leads to wealth accumulation.
 - ▶ Demographic Differences ⇒ Land grants often required African slaves, which could skew the demographics of a location.
 - ▶ Political dominance ⇒ Dominance by aristocrats often hampered efforts for local reform and investment ([Manchester, 1931; Bandecchi, 1963](#), p. 40)

Contribution

- ▶ Role of colonization, institutions, and land tenure in present outcomes:
 - ▶ Institutional and Natural Endowments: [Acemoglu et al., 2001 \(AER\)](#), [Sokoloff et al., 2000 \(JEP\)](#).
 - ▶ Americas: [Naritomi et al., 2012 \(JEH\)](#), [Musacchio et al., 2014 \(JEH\)](#), [Wigton-Jones, 2020 \(JEG\)](#), [Laudares et al., 2022 \(WP\)](#), [Sellars et al., 2018 \(JDE\)](#), [Smith, 2023 \(WP\)](#)
 - ▶ India and Africa: [Banerjee et al., 2005 \(AER\)](#), [Lowes et al., 2020 \(WP\)](#).

Data

- ▶ Information on the land grants from the [Sesmarias of the Luso-Brazilian Empire Database](#) [**Partially Added, In Progress**].

Data

- ▶ Information on the land grants from the [Sesmarias of the Luso-Brazilian Empire Database](#) [**Partially Added, In Progress**].
- ▶ Brazilian Censuses (1872-2010)
- ▶ Brazilian Agricultural Censuses (First one in 1920).
- ▶ LandSat data to measure land usage from [MapBiomas](#) (begins in 1985).
- ▶ Nightlight data from [Li et al. \(2020\)](#)
- ▶ Brazilian election results from 1889-1937 [History of Political Institutions](#) (To be released).
- ▶ FAO GAEZ dataset for crop suitability. [**Added for sugarcane**]

Example of Document



PA 0001
Carta de concessão a Domingos Pereira Valadares - 19/06/1738

Registro de uma carta de data e sesmaria passada a Domingos Pereira Valadares de 3 léguas de terra de comprimento e uma de largura, no sítio chamado a Serra dos Cocos.

João de Abreu Castelo Branco, do Conselho de Sua Majestade, governador e capitão-general do estado do Maranhão, etc. Faz saber, aos que esta minha carta de data e semeara virem, que Domingos Pereira Valadares me representou que ele se achava possuidor de grande número de gado vacum e cavalar, e não tinha terras em que apascentasse; e porque no distrito de jurisdição deste governo se achavam devolutas 3 léguas de terra de comprido e uma de largo, na paragem chamada a Serra dos Cocos, fazendo pila no nomeada São Lourenço e São João, e todas as vertentes anexas ao Rio Aratucu, cujo comprimento e largura corrente para a parte que melle conviesse, me pedia fosse concedido-lhe, em nome de Sua Majestade, as ditas 3 léguas de terra de comprido e uma de largo, por carta de sesmaria, para efeito que alegava; ao que atendendo, e a resposta que deu o provedor-mor da Fazenda Real, que havia visto do dito requerimento, e serviu em utilidade da mesma Fazenda o cultiva'rem-se estas terras neste efeito. Hei, por bem, conceder, em nome de Sua Majestade, ao dito Domingos Pereira Valadares, 3 léguas de terra de comprido e uma de largo, no sítio e com as referencias acima decidas e expressadas nas Reais Ordens, com condição de não fazer trespasso por motivo algum, em nenhum tempo, religião ou não, e mandando, que esta primeira dívida de d'la Fazenda ao provedor-mor dela, para se fazer presentes e ver se se deve ou não consentir no tal trespasso, sob pena de ficar nula esta data para se poder conceder novamente a outrem. E, nesta forma, se lhe passa herdeira, ascendente e descendente, como coisa sua própria, para ele e todos os seus herdeiros, ascendentess e descendentes, sem pensamento nem tributo algum mais que o dizimo a Deus, Nossa Senhor dos frutos que nelas tiver, a qual concessão he não faço prejudicando a terceiro nem a Sua Majestade, se no dito sítio quiser mandar fundar alguma villa, reservando os paus Reais que nela houver para embarcações, com declaração que mandará confirmar esta data por Sua Majestade dentro de 3 anos primeiros seguintes, e cultivaria as ditas terras de maneira que d'fruto, e dará caminhos públicos e particulares áonde forem necessários para pontes, fontes, portos e pedreiras; e se demarcara, ao tempo da posse, por rumo de corda e braçadas cravejadas, como é estilo e o dito senhor ordena. E, entrossim, não sucederão nelas religiões ou pessoas eclesiásticas, por quem título, e acertecendo, possuirão-las sera com o encargo de pagar delas dízimos a Nossa Senhor como se fossem possuidas por seculares; e se daram a quem demanda. Pelo que mandou ao provedor-mor que se fizessem as diligências necessárias para que o dito Domingos Pereira Valadares, devolvesse e se dando a quem demanda. Pelo que mandou ao provedor-mor que se fizessem as diligências necessárias para que o dito Domingos Pereira Valadares as ditas terras, para ele e todos os seus herdeiros, ascendentess e descendentes, como coisa sua própria. Cumpram e guardem esta carta de data e sesmaria tão interiormente como nela se contém, a qual lhe mandei passar por mim assinada e selada com o sinete de minhas armas, que se registraria ante tocar e se passou por duas vias. Dada na cidade de São Luís do Maranhão, aos 19 dias do mês de junho do anno do nascimento de Nossa Senhor Jesus Cristo de 1738. Eu, José Gonçalves da Fonseca, secretário do estado, a fiz // João de Abreu Castelo Branco[.]

Data

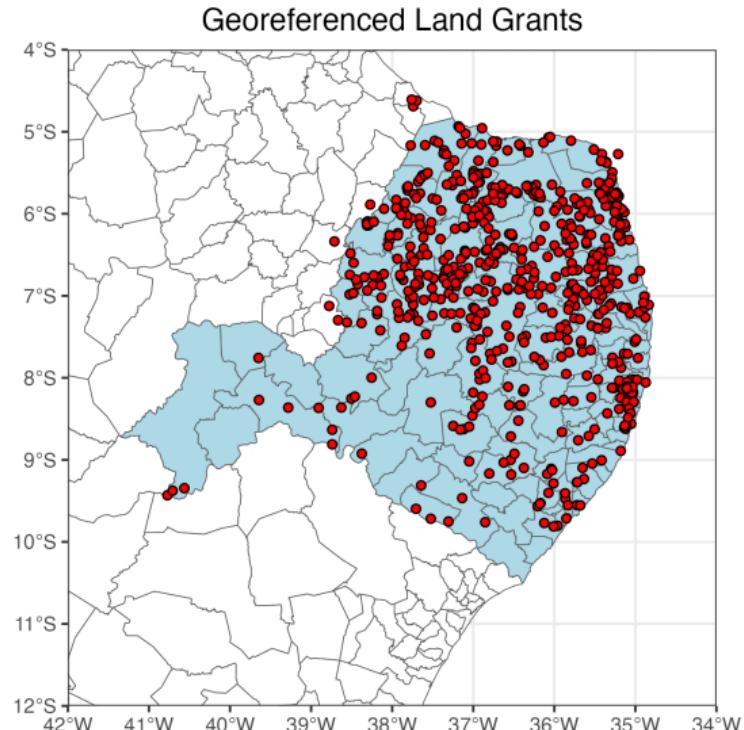
Information extracted from the letters:

- ▶ Location.
- ▶ Area.
- ▶ What purpose was the land requested (livestock, sugar plantation/factory, etc.).
- ▶ Year of Concession. Size Distribution Pre and Post 1697
- ▶ Type of Settler to whom it was granted.
- ▶ Who granted the request.

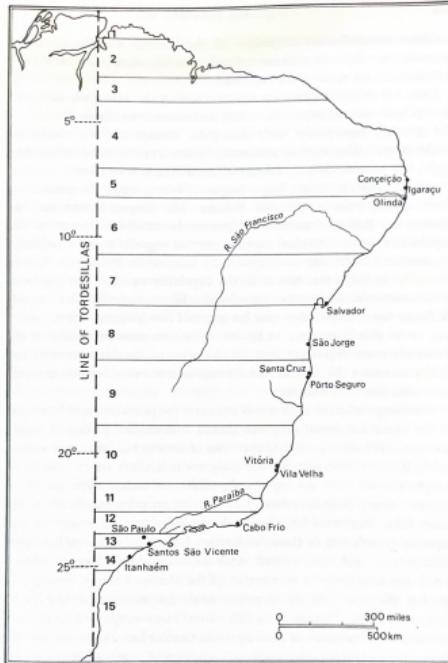
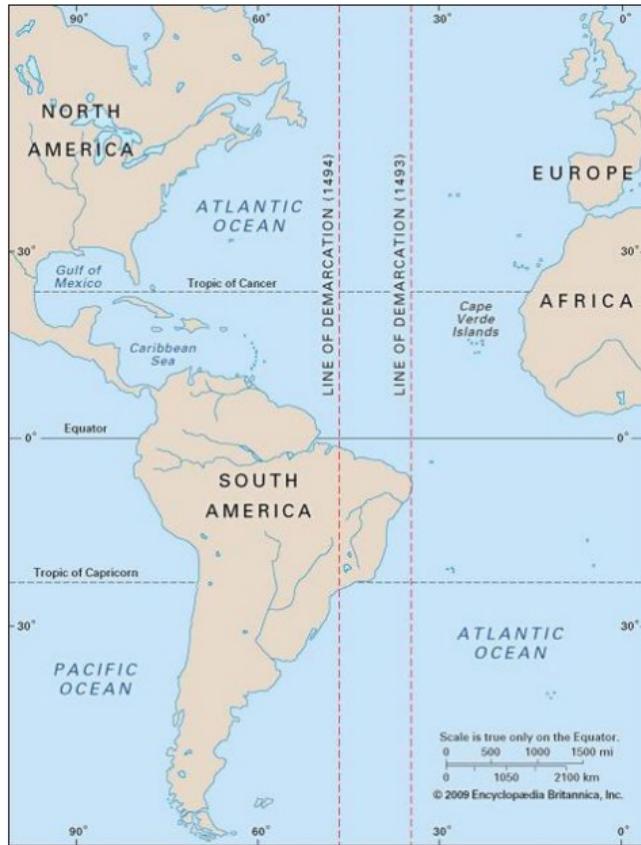
Summary Tables:

- ▶ Summary Tables: Municipality Summary Land Grant Summary

Georeferenced Data



Treaty of Tordesillas (1494)

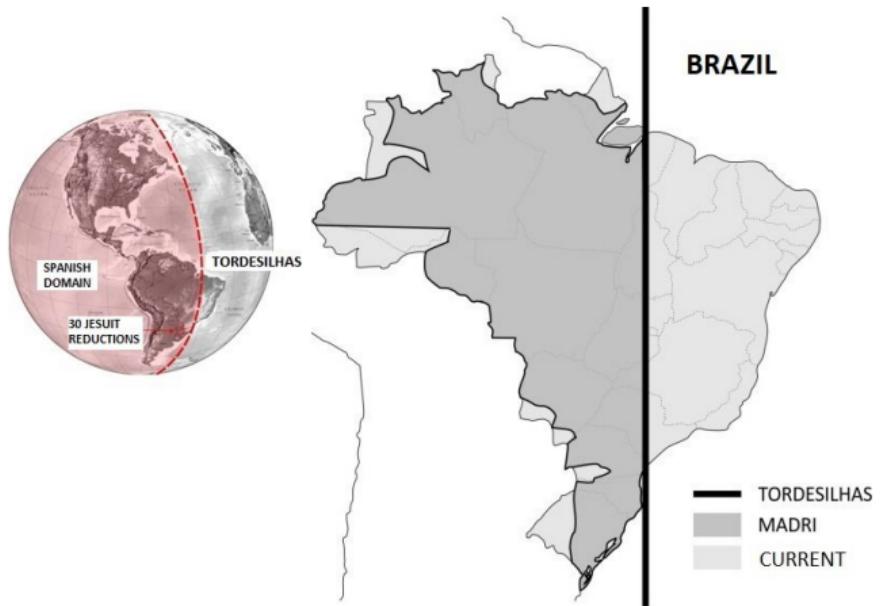


Key to Captaincies

1. João de Barros e Aires da Cunha (Pará), 2nd Part
2. Fernão Álvares de Andrade (Maranhão)
3. Antônio Cardoso de Barros (Paulínia)
4. João de Barros e Aires da Cunha, 1st Part
5. Pero Lopes de Sousa (Iamaracá)
6. Duarte Coelho (Pernambuco)
7. Francisco Pereira Coutinho (Bahia)
8. Jorge Figueiredo Correia (Ilhéus)
9. Pero do Campo Tourinho (Porto Seguro)
10. Vasco Fernandes Coutinho (Espírito Santo)
11. Pero de Gois (São Tomé)
12. Martim Afonso de Sousa (Rio de Janeiro), 2nd Part
13. Pero Lopes de Sousa (Santo Amaro), 1st Part
14. Martim Afonso de Sousa (São Vicente), 1st Part
15. Pero Lopes de Sousa (Sant'Ana), 2nd Part

Captaincies of Brazil in the sixteenth century

Treaty of Madrid (1750)



Identification

Fuzzy RDD Design

- ▶ Estimate a Fuzzy RDD in which the probability a municipality has a land grant is a function of whether it is located to the Portuguese side of the Treaty of Tordesillas (follows [Laudares et al., 2022 \(WP\)](#)).

Identification

Fuzzy RDD Design

- ▶ Estimate a Fuzzy RDD in which the probability a municipality has a land grant is a function of whether it is located to the Portuguese side of the Treaty of Tordesillas (follows [Laudares et al., 2022 \(WP\)](#)).

First Stage:

$$LandGrant_{m,s} = \delta \cdot TT_{m,s} + f(D_{m,s}) + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Second Stage:

$$Y_{m,s} = \beta \cdot \widehat{LandGrant}_{m,s} + f(D_{m,s}) + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Identification

Fuzzy RDD Design

- ▶ Estimate a Fuzzy RDD in which the probability a municipality has a land grant is a function of whether it is located to the Portuguese side of the Treaty of Tordesillas (follows [Laudares et al., 2022 \(WP\)](#)).

First Stage:

$$LandGrant_{m,s} = \delta \cdot TT_{m,s} + f(D_{m,s}) + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Second Stage:

$$Y_{m,s} = \beta \cdot \widehat{LandGrant}_{m,s} + f(D_{m,s}) + \mu_s + X_{m,s} + \epsilon_{m,s}$$

- ▶ **Issue:** For now I only have georeferenced data along the Northeast, which would require pushing the georeferencing to states alongside the coast. Also, since a RDD would require a lot of observations for power.

Identification

Dell et al., 2019

- ▶ Follow Dell et al., 2019 (REStud) in generating placebo land grants based on similar characteristics as the actual granted ones and estimate differential effect of both.
- ▶ **Idea:** “Propensity Score Matching” + randomization inference, but not on unit of observation but instead on the location of the land grants

$$Y_{i,s} = \alpha + \sum_{j=1}^D \delta_1 \cdot dgrant_{i,s}^j + \beta X_{i,s} + \epsilon_{i,s}$$

Identification

Instrumental Variable

- ▶ Exploit exogenous land quality for certain types of requests, following [Wigton-Jones, 2020](#) (JEG).

First Stage:

$$LandGrant_{m,s} = \delta \cdot Suitability_{m,s} + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Second Stage:

$$Y_{m,s} = \beta \cdot \widehat{LandGrant}_{m,s} + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Identification

Instrumental Variable

- ▶ Exploit exogenous land quality for certain types of requests, following Wigton-Jones, 2020 (JEG).

First Stage:

$$LandGrant_{m,s} = \delta \cdot Suitability_{m,s} + \mu_s + X_{m,s} + \epsilon_{m,s}$$

Second Stage:

$$Y_{m,s} = \beta \cdot \widehat{LandGrant}_{m,s} + \mu_s + X_{m,s} + \epsilon_{m,s}$$

- ▶ **Issue:** Tried with potential sugarcane output, and there is no first stage in 1872, but there is in 2010 FS FS - 2010

Descriptive Maps + OLS

Descriptive:

- ▶ Description of the Land Grants: Economic Activity Discovery Discovery by Year Claimed no land
Year of Request
- ▶ 1872 Census Maps: Slavery Sugarcane Output

Grid Level:

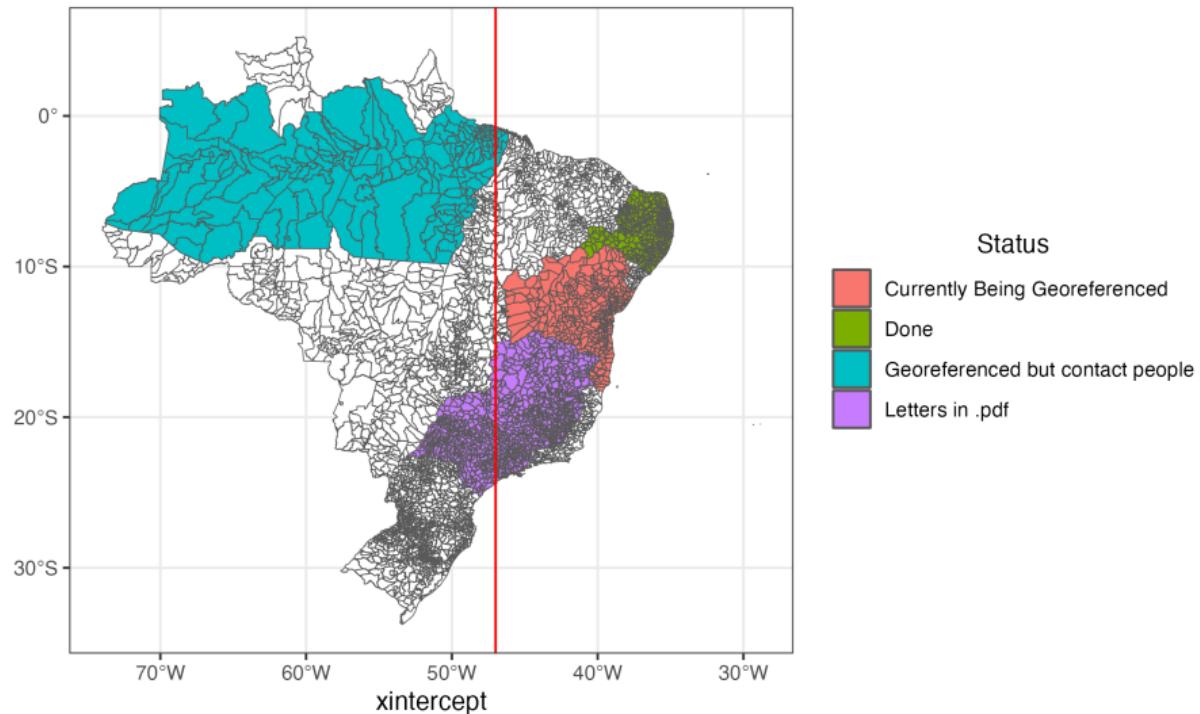
- ▶ Sugarcane: Potential Sugarcane Sugarcane Land Usage
- ▶ Pasture: Pasture Land Usage
- ▶ Nightlight: Nightlight

OLS Results:

- ▶ Land Usage: Economic Activity Economic Development Proxies Land Usage by Year of Grant

Future Steps

Data Collection



Future Steps

To Do List

- ▶ Add more data!
- ▶ Add the information on the data about the people to whom the land grant was requested.
 - ▶ In some cases, there is some information **which city/location** the petitioner lived.

References I

-  Acemoglu, D, S Johnson, and J A Robinson (2001). "The colonial origins of comparative development: An empirical investigation". In: *Am. Econ. Rev.*
-  Alston, Lee J, Gary D Libecap, and Bernardo Mueller (May 2010). *Titles, conflict, and land use*. Economics, Cognition, and Society. Ann Arbor, MI: University of Michigan Press.
-  Bandecchi, Brasil (1963). *Origem do latifúndio no Brasil*. por. Coleção Universidade do povo, 11. São Paulo: Editôra Fulgor.
-  Banerjee, Abhijit and Lakshmi Iyer (Sept. 2005). "History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India". In: *Am. Econ. Rev.* 95.4, pp. 1190–1213.
-  Costa Porto, José da (1979). *O sistema sesmarial no Brasil*. pt-BR. Editora Universidade de Brasília.
-  Dell, Melissa and Benjamin A Olken (Mar. 2019). "The Development Effects of the Extractive Colonial Economy: The Dutch Cultivation System in Java". en. In: *Rev. Econ. Stud.* 87.1, pp. 164–203.

References II

-  Laudares, Humberto and Felipe Valencia Caicedo (2022). *Tordesillas, slavery and the origins of Brazilian inequality*. https://conference.nber.org/conf_papers/f164242.pdf. Accessed: 2022-10-3.
-  Li, Xuecao et al. (June 2020). "A harmonized global nighttime light dataset 1992–2018". en. In: *Sci Data* 7.1, p. 168.
-  Lima, Ruy Cirne (2002). *Pequena história territorial do Brasil: sesmarias e terras devolutas*. pt-BR. Editora UFG.
-  Lowes, Sara and Eduardo Montero (Oct. 2020). *Concessions, Violence, and Indirect Rule: Evidence from the Congo Free State*. Tech. rep. w27893. Cambridge, MA: National Bureau of Economic Research.
-  Manchester, A K (1931). "The rise of the Brazilian Aristocracy". In: *Hisp. Am. Hist. Rev.*
-  Musacchio, Aldo, André Martínez Fritscher, and Martina Viarengo (Sept. 2014). "Colonial Institutions, Trade Shocks, and the Diffusion of Elementary Education in Brazil, 1889–1930". In: *J. Econ. Hist.* 74.3, pp. 730–766.

References III

-  Naritomi, Joana, Rodrigo R Soares, and Juliano J Assunção (May 2012). “Institutional Development and Colonial Heritage within Brazil”. In: *J. Econ. Hist.* 72.2, pp. 393–422.
-  Sellars, Emily A and Jennifer Alix-Garcia (Nov. 2018). “Labor scarcity, land tenure, and historical legacy: Evidence from Mexico”. In: *J. Dev. Econ.* 135, pp. 504–516.
-  Smith, Cory (2023). “Land concentration and Long-run development in the frontier United States”. In.
-  Sokoloff, Kenneth L and Stanley L Engerman (Sept. 2000). “Institutions, Factor Endowments, and Paths of Development in the New World”. In: *J. Econ. Perspect.* 14.3, pp. 217–232.
-  USAID (2016). *USAID COUNTRY PROFILE: PROPERTY RIGHTS AND RESOURCE GOVERNANCE - Brazil*. Tech. rep. USAID.
-  Wigton-Jones, Evan (Dec. 2020). “Legacies of inequality: the case of Brazil”. In: *J. Econ. Growth* 25.4, pp. 455–501.

History/Background

Request Process

- ▶ Petitioner submits a letter for an unoccupied land detailing their qualifications (captain, governor, etc.)

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.

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

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*.

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.

Selection

- ▶ Agglomeration: Effects on Neighboring Grids

Identification

Exploring the Content of the Letters

- ▶ Focus on the letters and their contents.
- ▶ Make the unit of observation a state by year.
- ▶ **Example Research Question:** How would a change in state governorship affect the contents of the letter:
 - ▶ **Channel:** New governor, not enough information on how strict he would be enforcing the land grants ⇒ the letters are longer and more specific.

Other Relevant (?) Information to Add

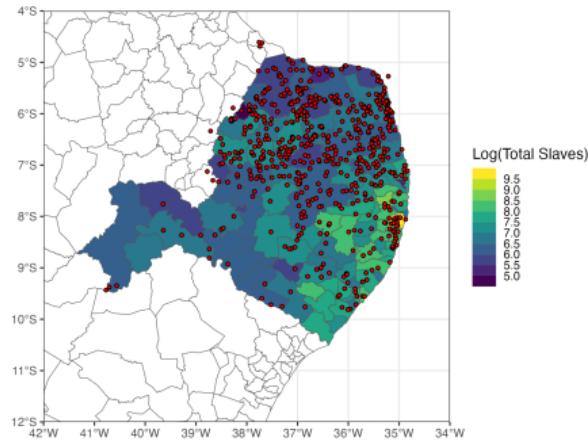
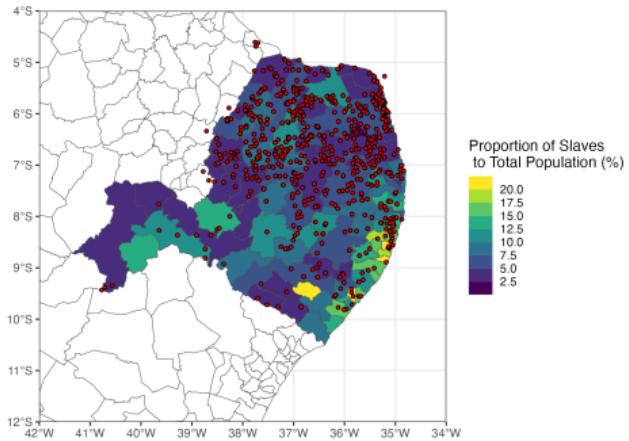
- ▶ *Sesmarias* caused economic uncertainty in colonial times as often poor people would settle, develop land, and then lose the right of the land because a richer person would claim it ([Costa Porto, 1979](#), p. 142).

Manueline Ordinances 1511-1512

“Na petição por uma carta de sesmaria, o requerente devia justificar seu pedido, e quando recebesse a carta de concessão havia uma serie de obrigações entre as quais estava a necessidade do cultivo”

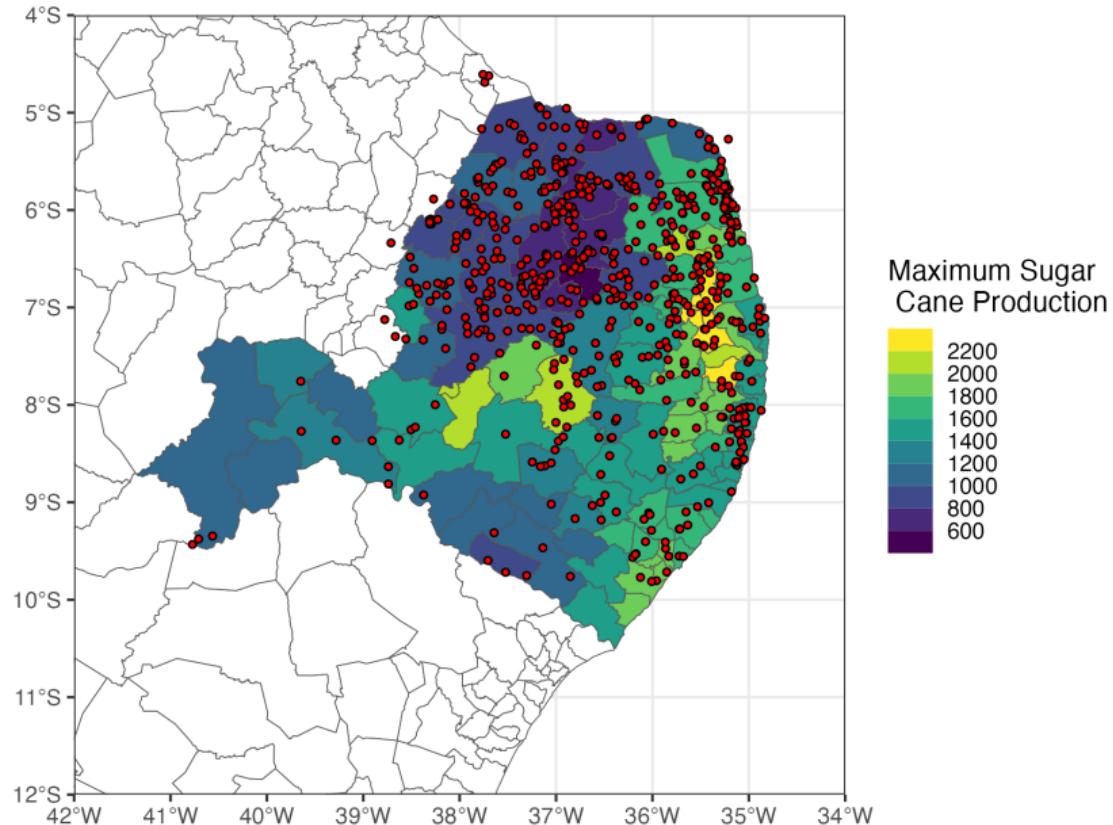
1872 Census - Slavery Distribution

[Back](#)



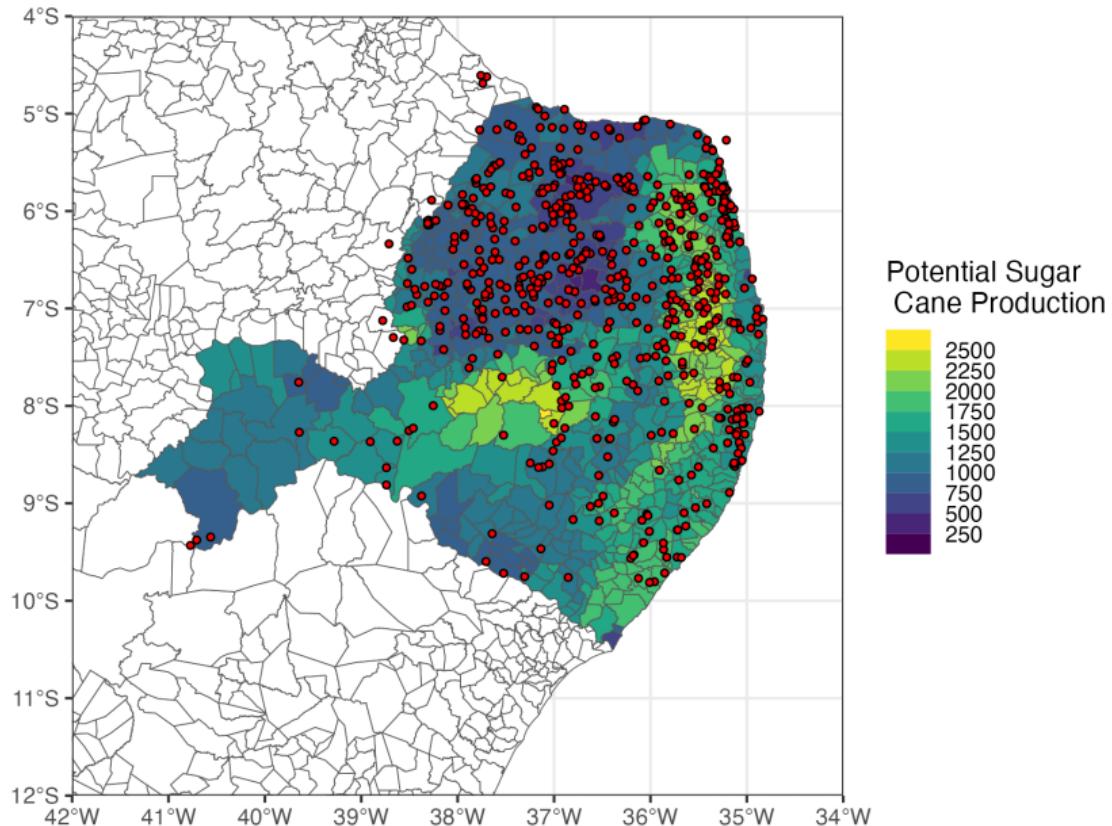
1872 Census - Potential Sugarcane Output

[Back](#)



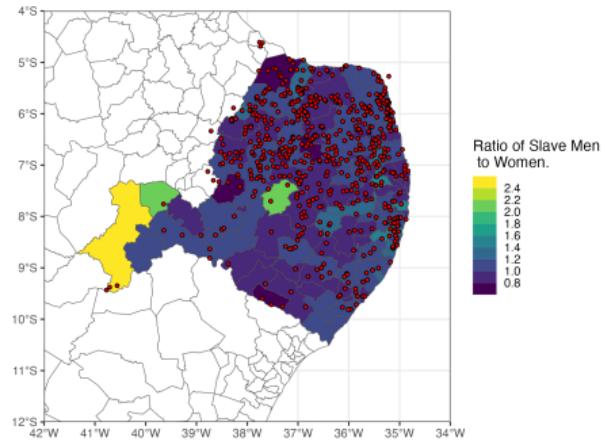
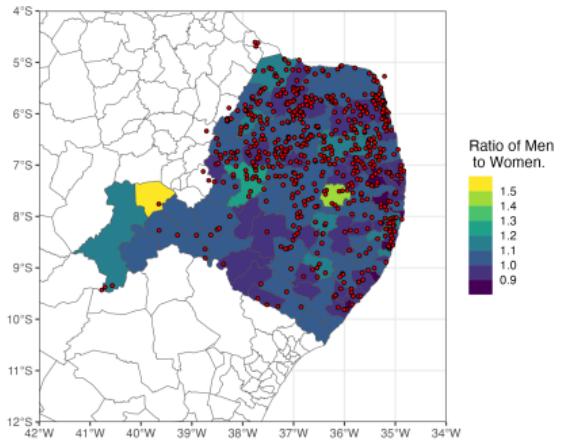
2010 Census - Potential Sugarcane Output

[Back](#)



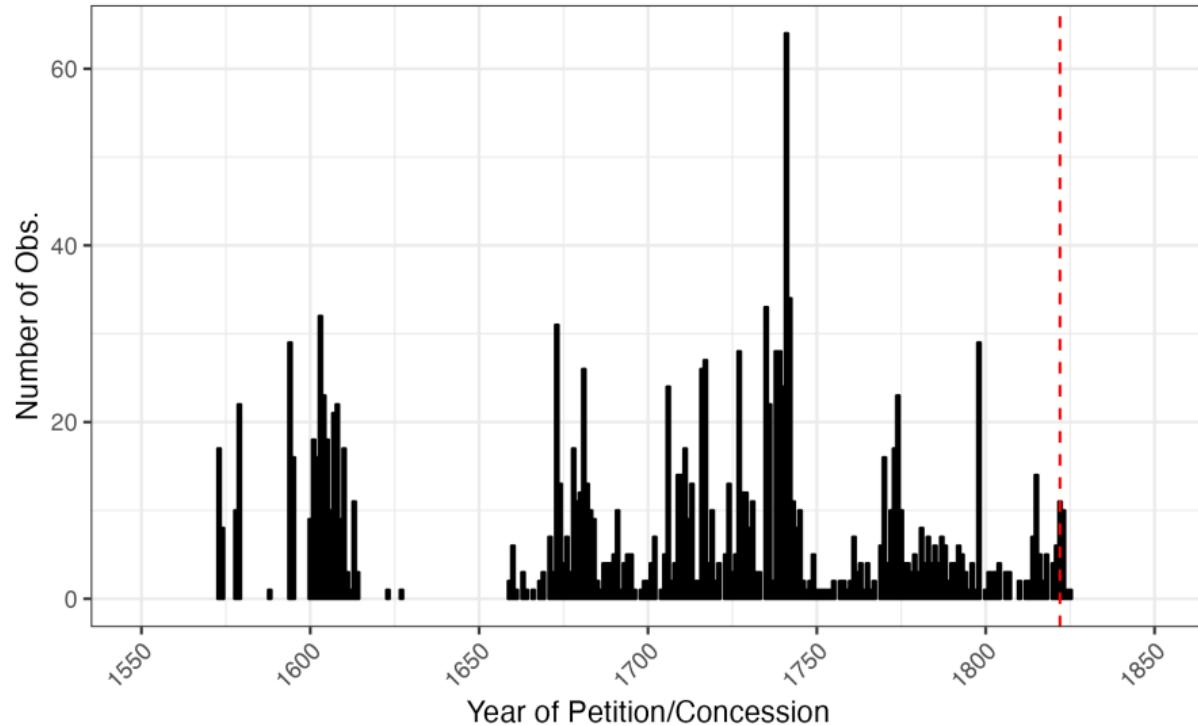
1872 Census - Gender Distribution

[Back](#)



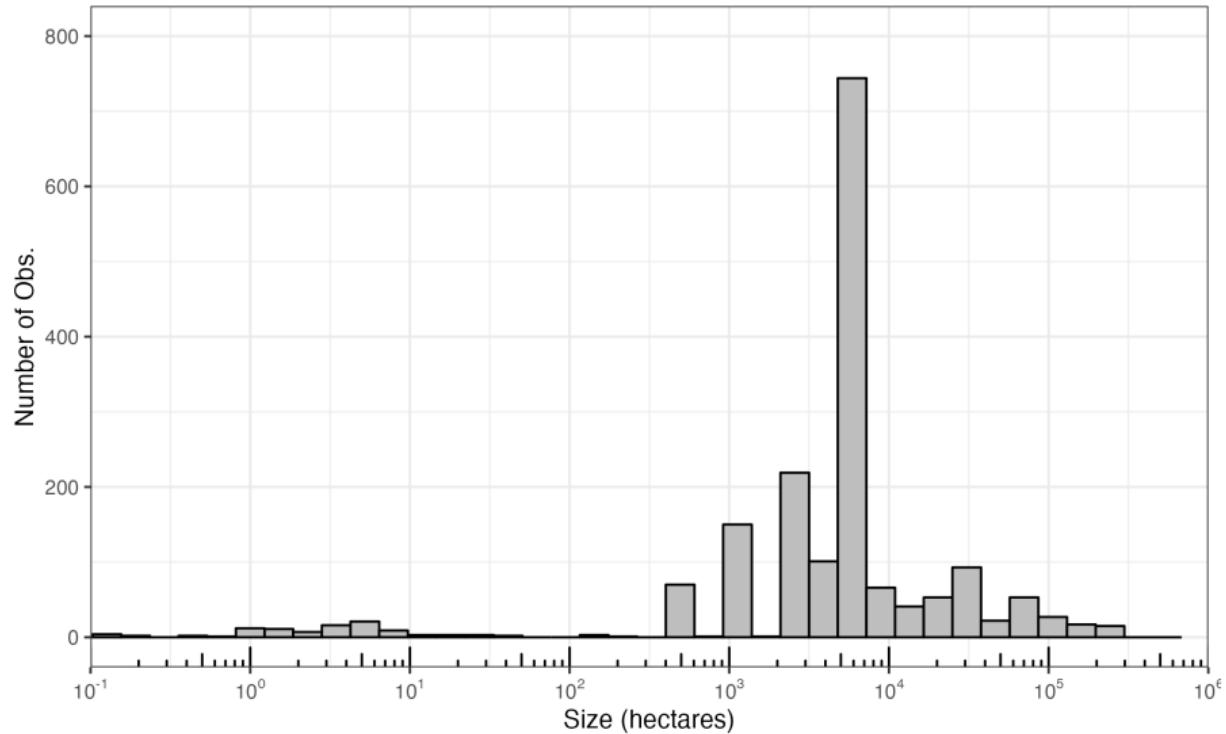
Basic Descriptive Statistics

Year Dist. [Back](#)



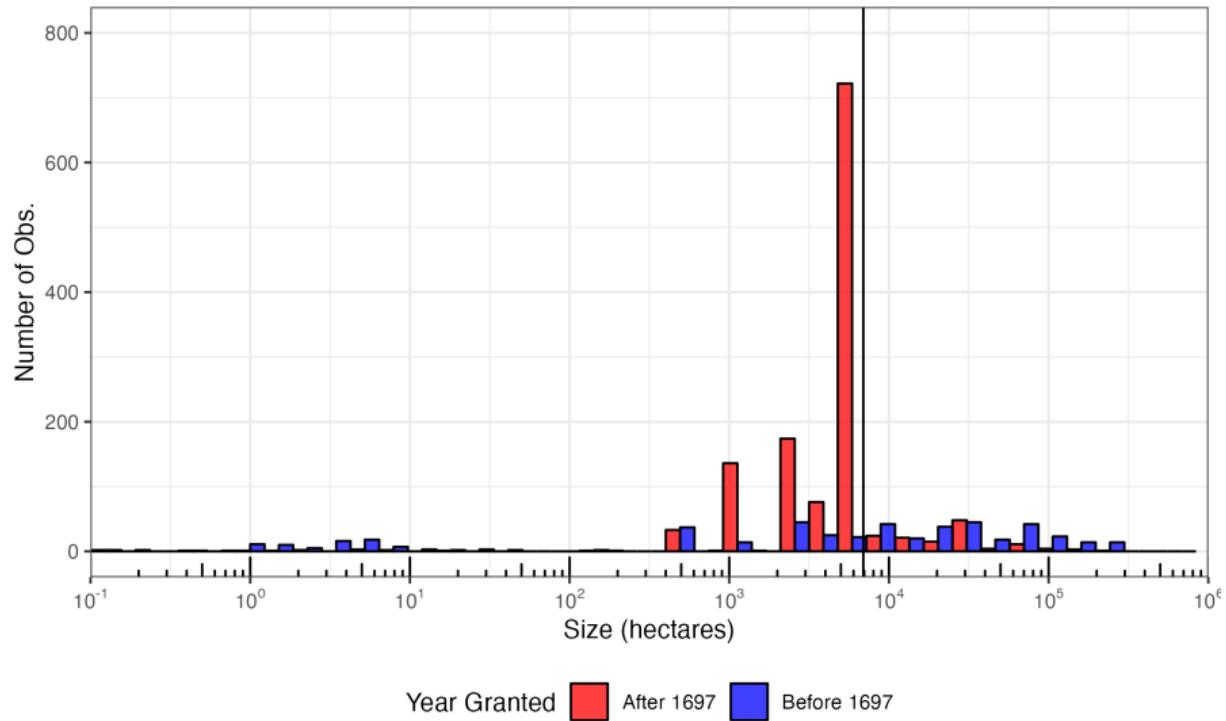
Basic Descriptive Statistics (1 hec = 2.5 Football Fields)

Size Dist. [Back](#)



Basic Descriptive Statistics (1 hec = 2.5 Football Fields)

Size Dist. [Back](#)

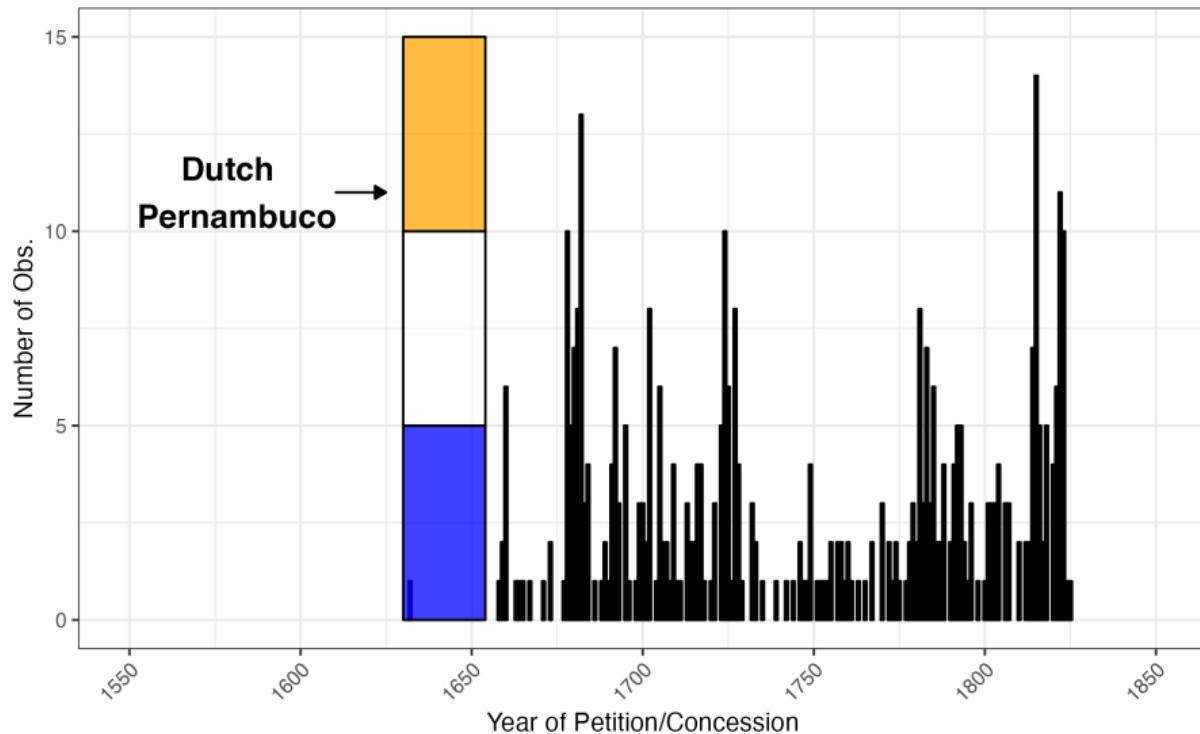


Smallest Land Grant

- ▶ The smallest land grant we have in the dataset is from 1603, in Rio de Janeiro (RJ0118). The petitioner asked for some land to build a house in the city of São Sebastião, which explains why in hectares it is so small.

Basic Descriptive Statistics

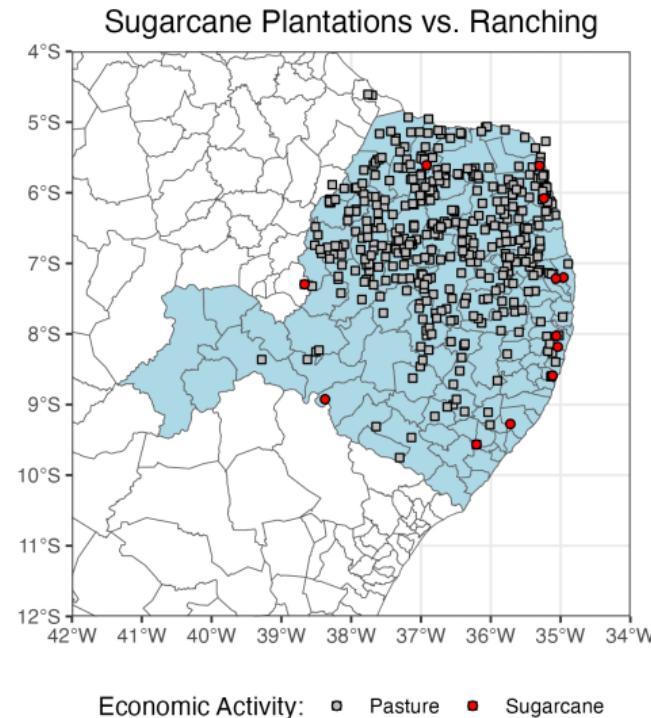
No Obs. in Pernambuco



Georeferenced Land Grants

[Back](#)

Sugarcane vs. Ranching

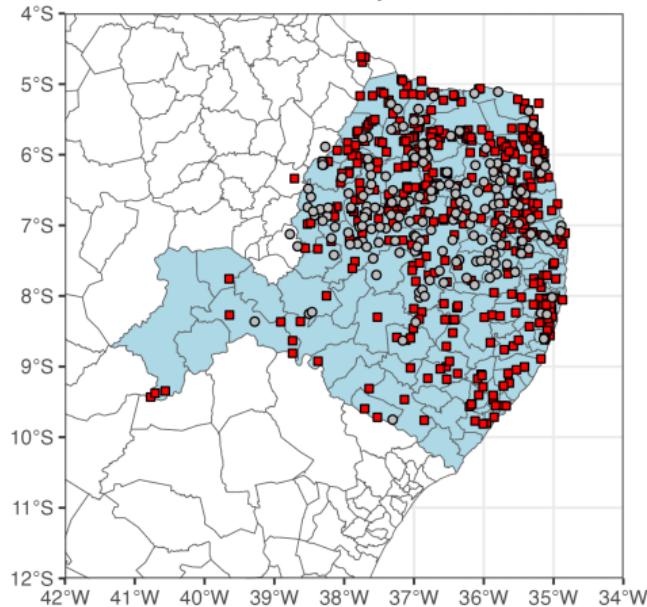


Georeferenced Land Grants

[Back](#)

Alleged Discovery of the Land

Claimed Discovery of the Land

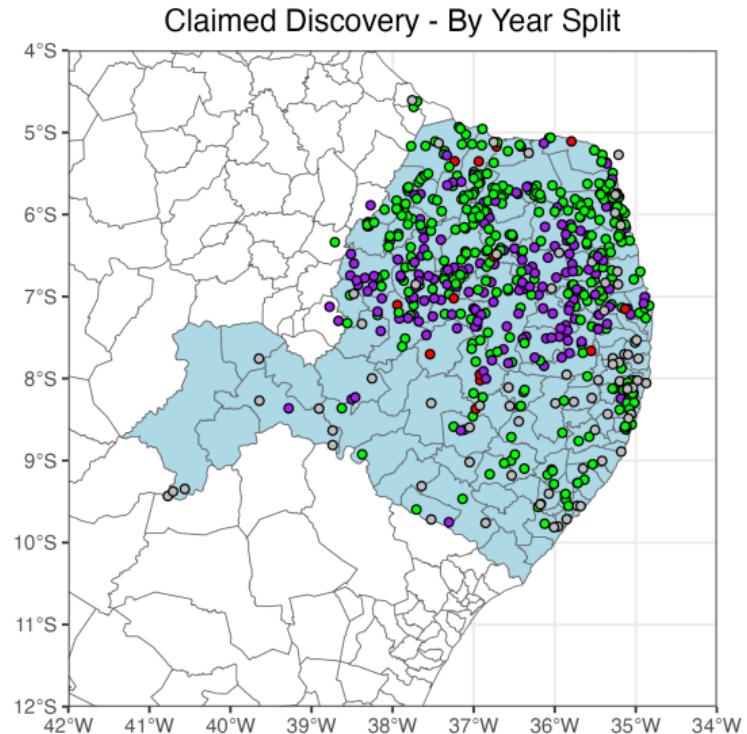


Claimed Discovery of Land: □ No ■ Yes

Georeferenced Land Grants

[Back](#)

Alleged Discovery of the Land



Claimed Discovery of Land - Year:

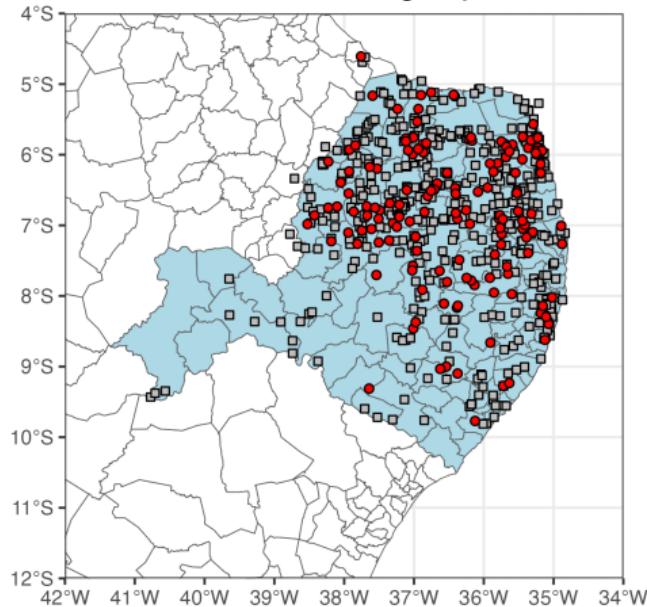
- No - Pre 1700
- Yes - Pre 1700
- No - Post 1700
- Yes - Post 1700

Georeferenced Land Grants

[Back](#)

Alleged Discovery of the Land

Claimed Not Owning Any Land



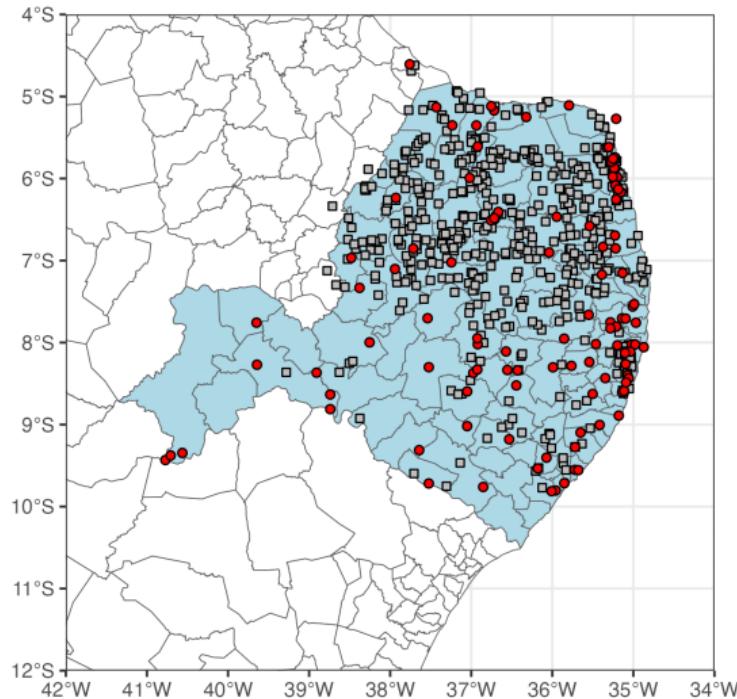
Claimed Not Owning Land: □ No ■ Yes

Georeferenced Land Grants

[Back](#)

Year of the Land Grant

Pre and Post 1700

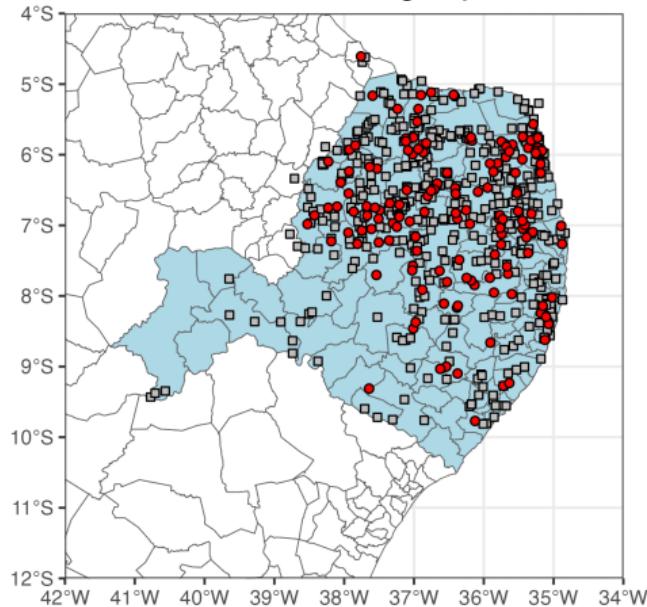


Georeferenced Land Grants

[Back](#)

Alleged Discovery of the Land

Claimed Not Owning Any Land

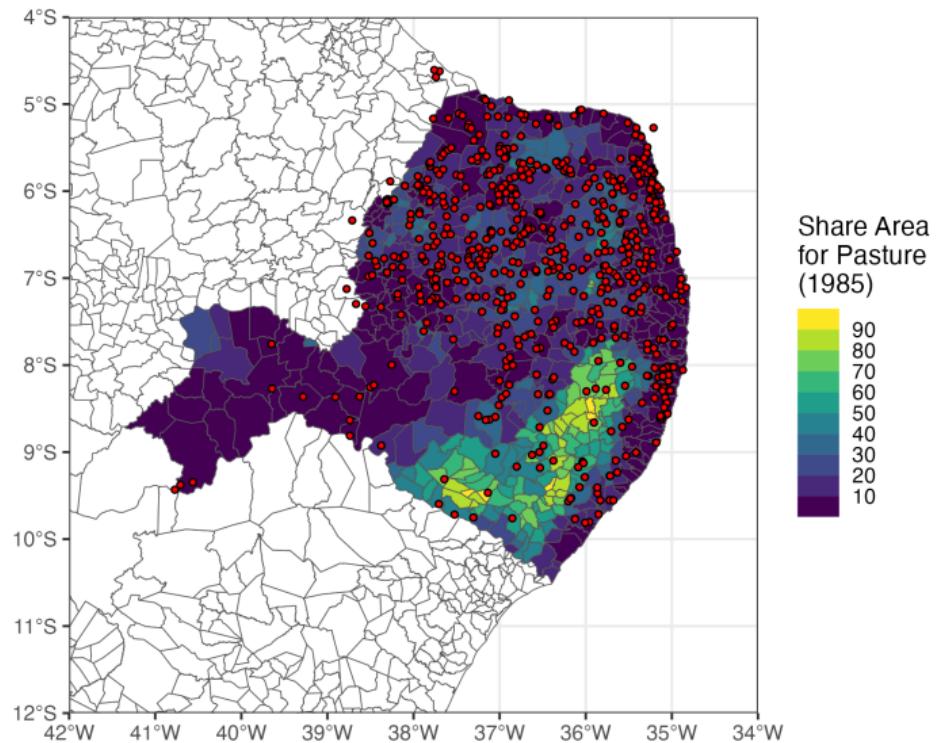


Claimed Not Owning Land: □ No ■ Yes

Georeferenced Land Grants

[Back](#)

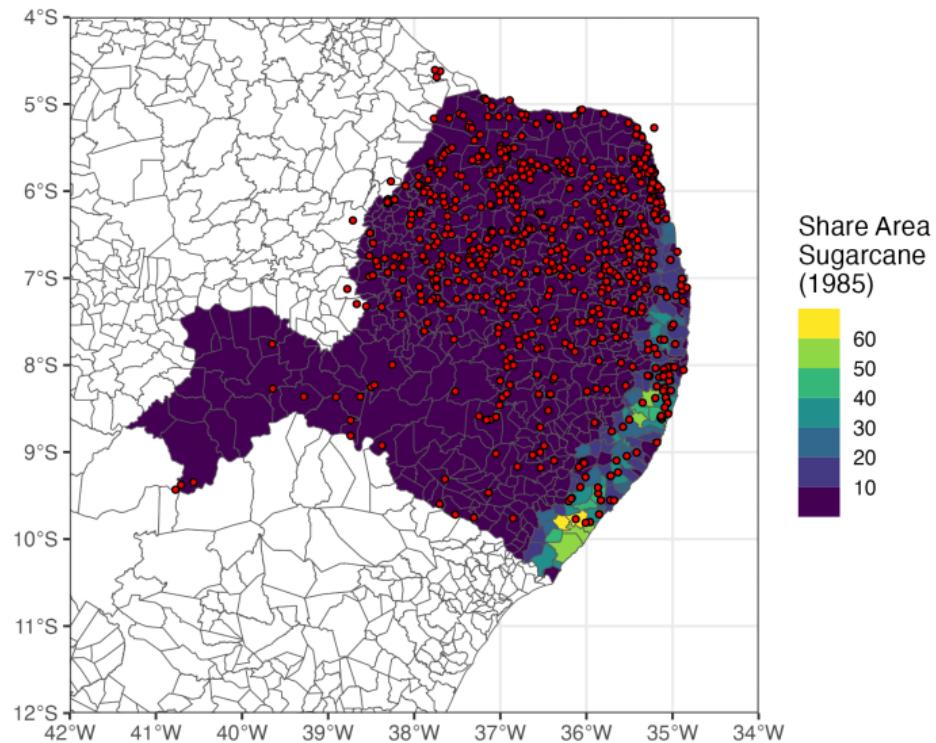
Alleged Discovery of the Land



Georeferenced Land Grants

[Back](#)

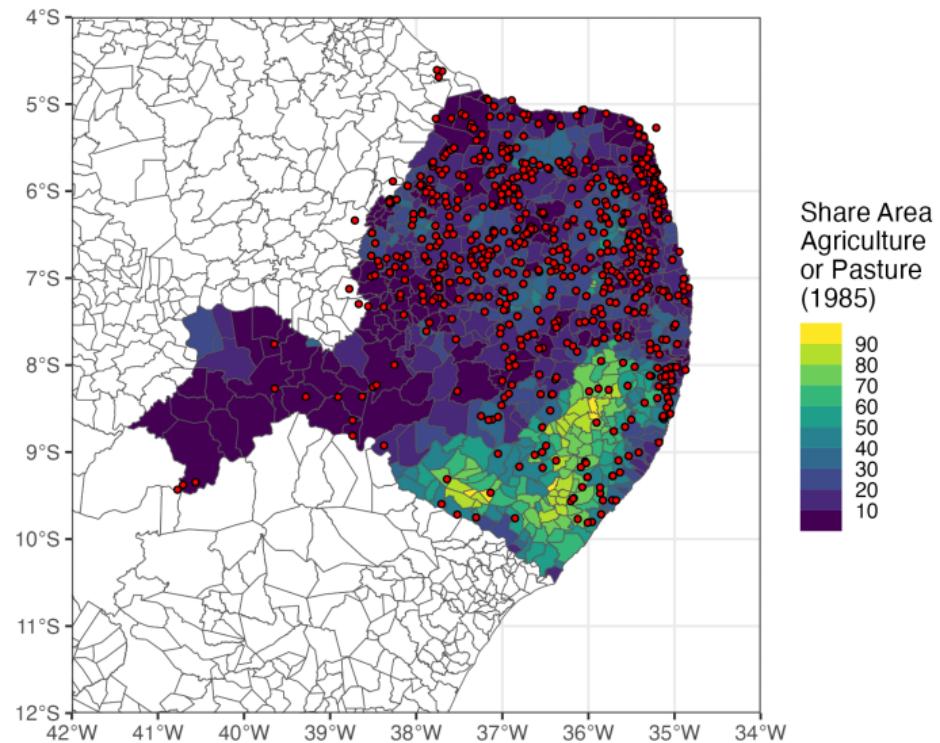
Alleged Discovery of the Land



Georeferenced Land Grants

[Back](#)

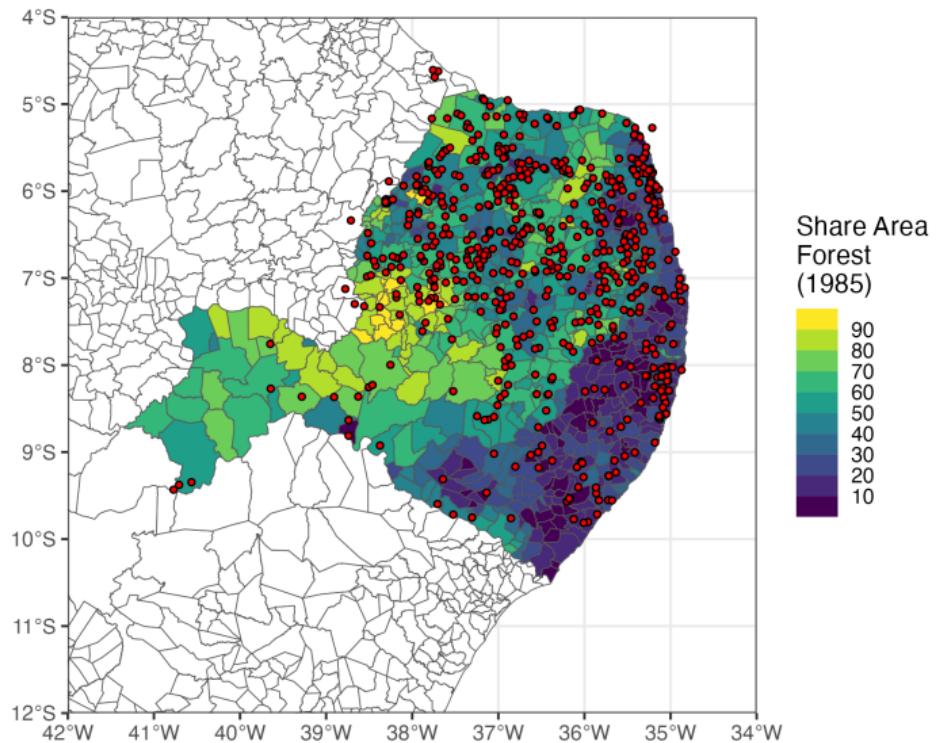
Alleged Discovery of the Land



Georeferenced Land Grants

[Back](#)

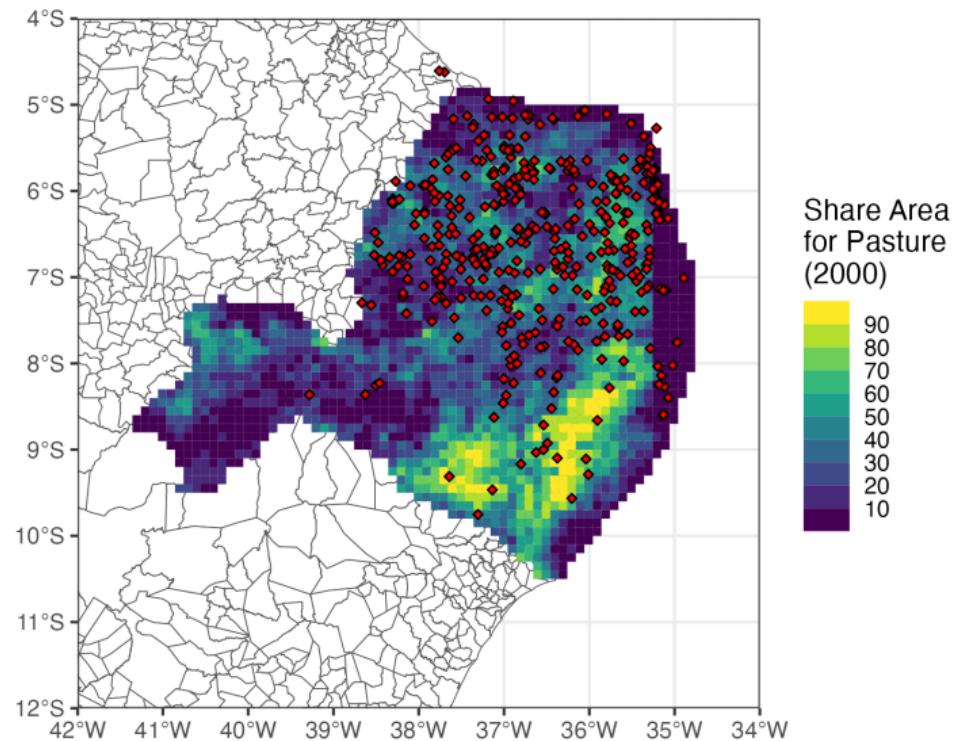
Alleged Discovery of the Land



Georeferenced Land Grants

[Back](#)

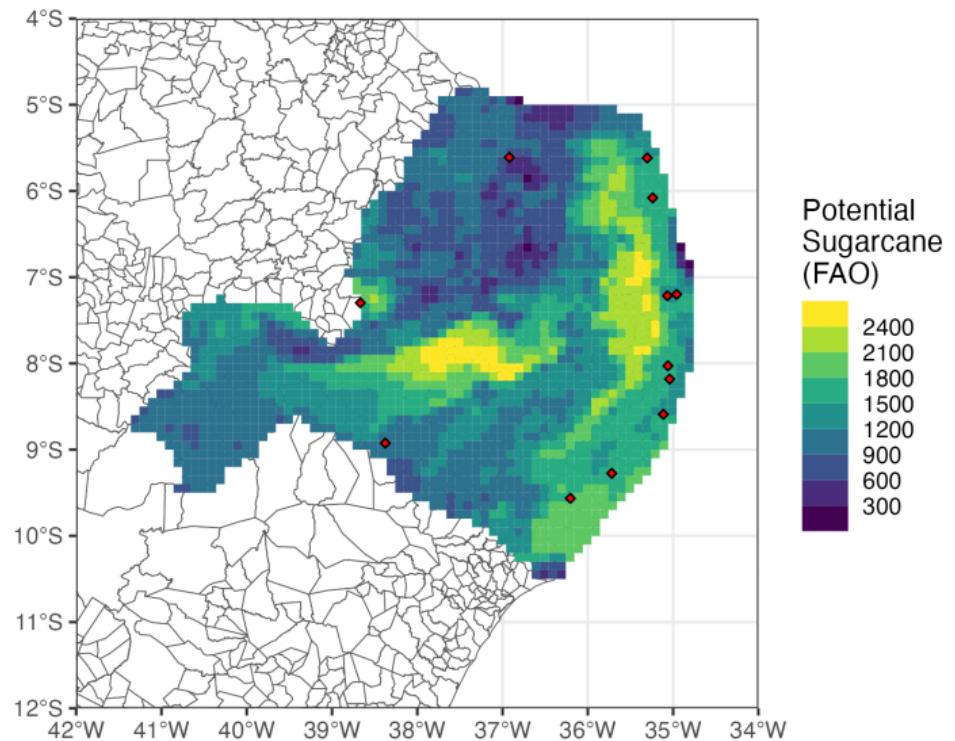
Pasture request + Land Usage in 2000



Georeferenced Land Grants

[Back](#)

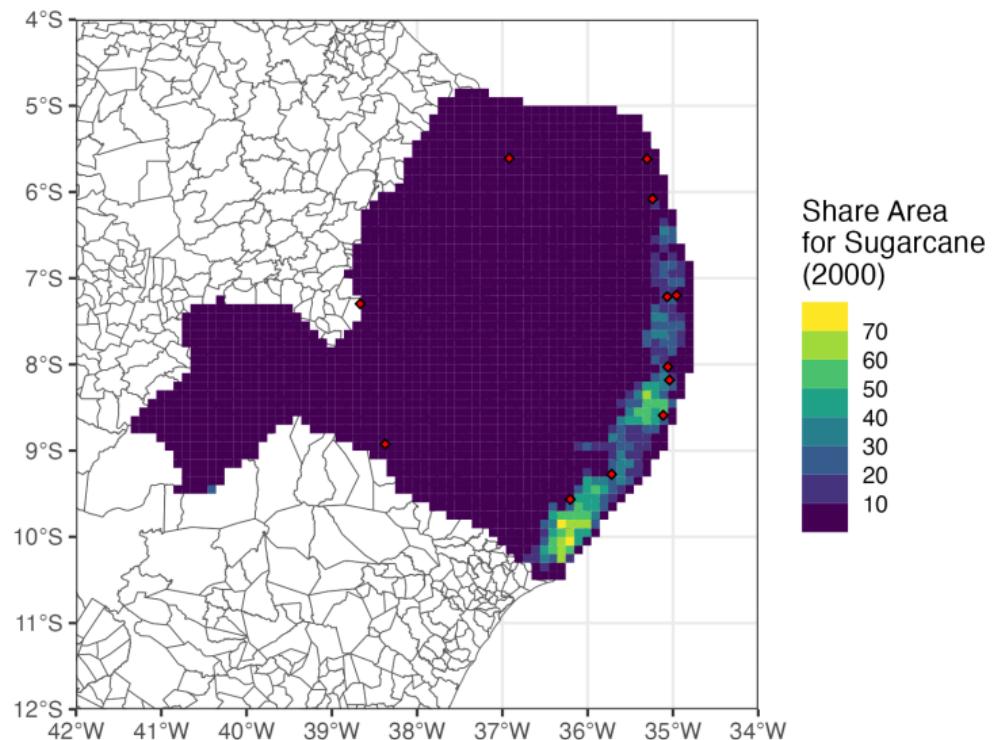
Sugarcane request + Potential Sugarcane Production



Georeferenced Land Grants

[Back](#)

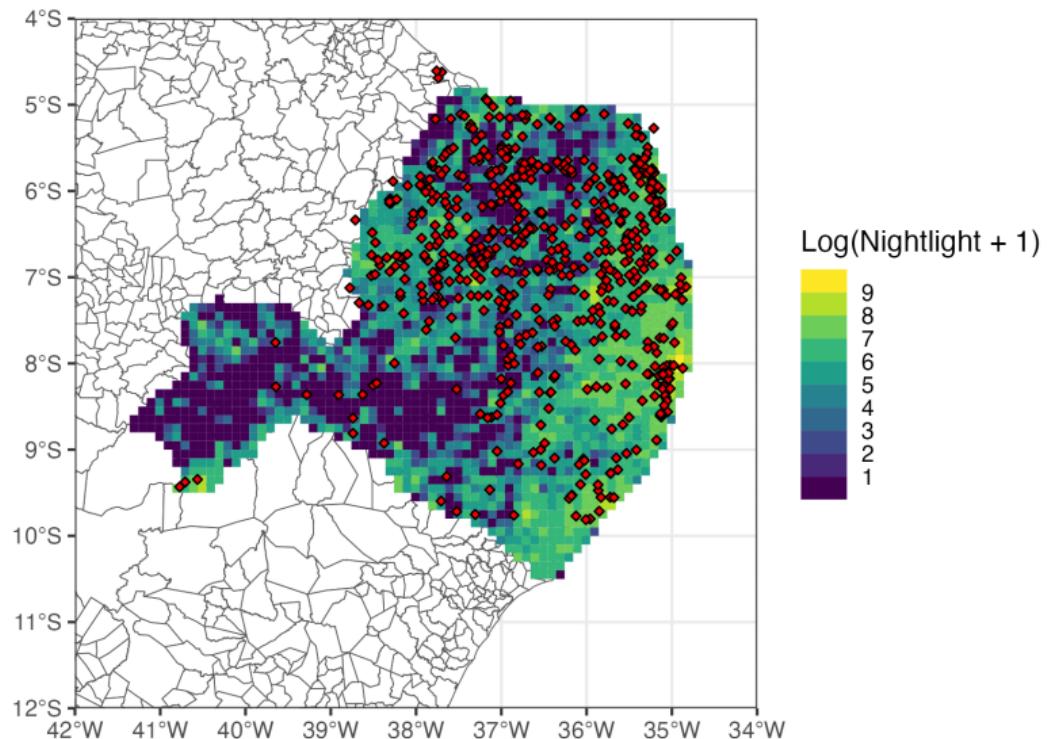
Sugarcane request + Area used for Sugarcane (2000)



Georeferenced Land Grants

[Back](#)

All requests + Nightlight data (2000)



First-Stage Estimates - 1872

[Back](#)

Table: Effects of Potential Sugarcane Output on Land Grants

	Any Land Grants		Sugar Land Grants	
	(1)	(2)	(3)	(4)
Maximum Sugarcane Output (Thousand of Tons per hectare)	-0.085 (0.079)	-0.068 (0.109)	0.027 (0.064)	-0.041 (0.073)
N	104	104	104	104
Geographical Controls		✓		✓
R ²	0.15	0.23	0.02	0.12

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

First-Stage Estimates - 2010

Back

Table: Effects of Potential Sugarcane Output on Land Grants - 2010

	Any Land Grants		Sugar Land Grants	
	(1)	(2)	(3)	(4)
Maximum Sugarcane Output (Thousand of Tons per hectare)	-0.039 (0.038)	-0.093** (0.042)	0.001 (0.006)	-0.019* (0.010)
N	677	677	677	677
Geographical Controls		✓		✓
R ²	0.09	0.19	0.00	0.04

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

First-Stage Estimates - Grid

Back

Table: Effects of Potential Sugarcane Output on Land Grants

	Any Land Grants		Sugar Land Grants	
	(1)	(2)	(3)	(4)
Maximum Sugarcane Output (Thousand of Tons per hectare)	0.054*** (0.020)	-0.009 (0.023)	0.002 (0.003)	-0.005* (0.003)
N	2083	2083	2083	2083
Geographical Controls		✓		✓
R ²	0.11	0.13	0.00	0.01

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

Table: OLS of Land Grants on Present Day Economic Activity

	Area dedicated to Sugarcane		Area dedicated to Livestock	
	(1)	(2)	(3)	(4)
Sugar Land Grants	10.132** (4.810)	4.022 (3.827)	-15.872*** (5.837)	-10.327** (5.139)
Livestock Land Grants	-0.051 (0.389)	-0.609* (0.328)	7.505*** (1.366)	6.052*** (1.330)
Geographical Controls		✓		✓
DV Mean	2.79	2.79	30.96	30.96
N	2083	2083	2083	2083
R ²	0.15	0.34	0.11	0.27

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

Table: OLS of Land Grants on Economic Development

	Ln(Nightlight + 1)		Urban Area (%)	
	(1)	(2)	(3)	(4)
Sugar Land Grants	2.308*** (0.539)	0.623** (0.315)	1.283 (0.989)	0.395 (0.928)
Livestock Land Grants	0.658*** (0.158)	0.425*** (0.137)	0.203 (0.182)	0.108 (0.180)
Geographical Controls		✓		✓
DV Mean	4.25	4.25	0.57	0.57
N	2083	2083	2083	2083
R ²	0.11	0.34	0.00	0.06

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

Table: OLS of Land Grants by Year of Grant on Land Usage

	Sugarcane Area (%)		Pasture Area (%)		Urban Area (%)	
	(1)	(2)	(3)	(4)	(5)	(6)
Grants Pre-1697	5.223*** (1.511)	1.605 (1.260)	-7.529*** (2.613)	-7.339*** (2.378)	2.302** (0.953)	1.824** (0.887)
N	2083	2083	2083	2083	2083	2083
Geographical Controls		✓		✓		✓
DV Mean	2.79	2.79	30.96	30.96	0.57	0.57
R ²	0.16	0.34	0.10	0.27	0.03	0.07

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

Table: OLS of Land Grants on Surrounding Grids

	Surrounding Grids Land Grant Presence (0/1)		Surrounding Grids Number of Land Grants			
	(1)	(2)	(3)	(4)	(5)	(6)
At Least One Land Grant	0.147*** (0.021)	0.084*** (0.021)	1.195*** (0.164)	0.921*** (0.153)		
Total Land Grants					0.770*** (0.116)	0.620*** (0.106)
Geographical Controls		✓		✓		✓
DV Mean	0.6	0.6	1.93	1.93	1.93	1.93
N	2083	2083	2083	2083	2083	2083
R ²	0.30	0.41	0.33	0.39	0.34	0.40

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

Grid Level

Table: Summary Statistics for the Land Grants - Grid Level

	At least 1 Land Grant (N=427)		No Land Grants (N=1656)		Diff. in Means	Std. Error
	Mean	Std. Dev.	Mean	Std. Dev.		
Geographical						
Distance to Nearest River (km)	296.0	115.0	182.3	140.7	-113.7**	6.6
Distance to the Coast (km)	105.9	86.9	187.7	144.3	81.9**	5.5
Mean Slope (m)	2.3	1.6	2.4	1.6	0.1	0.1
Mean Elevation (m)	267.8	206.4	347.3	208.8	79.5**	11.2
Latitude	-36.6	1.1	-37.5	1.6	-0.9**	0.1
Longitude	-7.0	1.1	-7.8	1.3	-0.8**	0.1
Agriculture						
Potential Sugarcane Output (FAO)	1318.8	542.8	1320.0	447.9	1.2	28.5
Maximum Calories Pre-1500 (Galor, 2016)	11331.1	1568.6	11022.0	2253.7	-309.0**	94.0
Maximum Calories Post-1500 (Galor, 2016)	11567.7	1320.4	11186.7	2166.6	-381.0**	83.2
Satellite Data						
Sugarcane Area (%)	2.9	9.2	2.8	9.7	-0.2	0.5
Livestock Area (%)	31.9	22.0	30.7	24.4	-1.2	1.2
Urban Area (%)	1.1	4.8	0.4	2.0	-0.7**	0.2
Ln(Nightlight + 1)	744.4	1155.1	394.2	685.6	-350.2**	58.4

Balance Tables

[Back](#)

1872 Municipality Level

Table: Summary Statistics for Municipalities in 1872

	At least 1 Land Grant (N=86)		No Land Grants (N=18)		Diff. in Means	Std. Error
	Mean	Std. Dev.	Mean	Std. Dev.		
Geographical						
Distance to Nearest River (km)	230.3	129.7	136.8	115.9	-93.6**	30.7
Distance to the Coast (km)	79.3	90.2	83.9	134.8	4.6	33.2
Mean Slope (m)	2.7	1.1	3.1	1.5	0.4	0.4
Mean Elevation (m)	259.0	199.8	193.2	207.2	-65.9	53.4
Agriculture						
Potential Sugarcane Output (FAO)	1436.2	422.4	1647.6	333.9	211.4**	90.9
Maximum Calories Pre-1500 (Galor, 2016)	11061.2	1506.3	9963.2	1514.2	-1098.0**	392.1
Maximum Calories Post-1500 (Galor, 2016)	11494.7	1054.4	10714.4	1300.4	-780.3**	326.9
Demographics						
Total Population	17591.1	14256.7	15940.1	11420.2	-1650.9	3099.8
Enslaved Population as Total (%)	8.0	4.3	10.8	6.1	2.8***	1.5
Ratio of Free Men to Free Women	1.0	0.1	1.0	0.1	0.0***	0.0
Ratio of Enslaved Men to Enslaved Women	1.1	0.3	1.0	0.1	-0.1***	0.0
Labor						
Proportion of Industrial Workers (%)	0.9	0.8	1.3	1.4	0.4	0.3
Proportion of Enslaved People working in Farming (%)	36.5	20.4	38.8	18.6	2.3	4.9
Proportion of Farmers (%)	31.6	15.3	27.5	13.4	-4.1	3.6
Proportion of Free Men Farmers (%)	44.3	16.9	39.2	17.6	-5.0	4.5
Proportion of Free Women Farmers (%)	17.4	17.8	12.5	12.5	-5.0	3.5
Human Capital						
Literacy Rate (%)	16.3	8.3	13.5	6.2	-2.8	1.7

Table: Summary Statistics for the Land Grants

	Granted between 1624-1696 (N=101)		Granted between 1697-1750 (N=531)		Diff. in Means	Std. Error
	Mean	Std. Dev.	Mean	Std. Dev.		
Distance to Nearest River (km)	359.6	873.8	342.9	345.6	-16.7	88.2
Distance to the Coast (km)	183.7	926.9	119.9	342.8	-63.9	93.4
Mean Slope (m)	2.2	2.1	2.2	2.5	0.0	0.2
Mean Elevation (m)	200.5	224.9	253.2	201.8	52.7**	24.1
Potential Sugarcane Output (FAO)	1413.0	522.1	1281.0	549.0	-132.0**	57.6
Maximum Calories Pre-1500 (Galor, 2016)	10473.6	1993.8	11482.7	1316.7	1009.1**	208.4
Maximum Calories Post-1500 (Galor, 2016)	11022.9	1754.8	11660.0	1073.5	637.2**	182.4