

Pedro Henrique Batista de Barros

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INTERESTS

Environmental and Resource Economics, Remote Sensing, GIS, Data Science, Machine Learning, Statistics, Econometrics.

EDUCATION

2024 PhD in Economics at University of São Paulo (FEA-USP)

2023/24 MBA in Data Science at University of São Paulo.

2022/23 Visiting Scholar at Johns Hopkins University, Carey Business School and the Department of Environmental Health and Engineering.

2021 MBA in Agribusiness at University of São Paulo.

2019 MA in Economics, University of Ponta Grossa.

2018 Specialization in Mathematics at Candido Mendes University.

2017 BA in Economics, Federal University of Paraná.

WORK EXPERIENCE

- **Postdoctoral Research Fellow** at *Land, Environment, Economics, and Policy (LEEP) Institute, University of Exeter*, UK (September 2024 - Present).
 - Working under the supervision of Professor Ian Bateman on topics related to Environmental and Resource Economics.
 - Applying advanced statistical, machine learning, remote sensing and GIS techniques.
- **Researcher** at IPEA (*Institute of Applied Economic Research*), Brasilia, Brazil (April 2024 - present).
 - Applying Data Science, Big Data, GIS, statistical inference and economics to conduct research that informs and supports public policy development.
 - Developing tools and insights to assist public decision-makers in strategic planning and policy implementation.
- **Researcher** at IDR-PR (*Rural Development Institute of Paraná*), Londrina, Brazil (March 2024 - August 2024).
 - Conducting economic cost-benefit analyses to evaluate agricultural practices.
 - Applying statistical inference techniques to assess the impact of agricultural public policies.
- **Consultant** at FIPE (*Economic Research Foundation and Institute*), São Paulo, Brazil (June 2023 - August 2024).
 - Conducting advanced statistical analysis and geospatial data modeling to assess the impacts of environmental disasters.
 - Performing economic and financial analysis for public infrastructure concessions in public-private partnerships (PPPs).
- **Spatial Data Scientist** at *Picssel*, São Paulo, Brazil (March 2023 - March 2024).

- Specialized in the integration of data science, statistical models, and algorithms within GIS and remote sensing frameworks for agricultural mapping and prediction.
- **Research Assistant** at USP (*University of São Paulo*), São Paulo, Brazil (August 2020 - September 2022).
 - Conducted spatial econometric analysis and developed statistical models to evaluate the impact of locational attributes on oil and gas concession auctions.
 - Applied GIS techniques, Big Data, and causal inference methods to analyze bidding patterns and decision-making in the energy sector.

SKILLS AND LANGUAGES

Data management and analytics: Python, R, JavaScript, Stata, Geographic Information System (GIS), Remote Sensing, Machine Learning, Google Earth Engine (GEE).

Languages: Portuguese (Mother Tongue), English (Proficiency), Spanish (Passive).

SCIENTIFIC PUBLICATIONS

1. "Economic growth and the preservation of the Amazon rainforest: Is it possible to reconcile?" with Ariaster Chimeli. Revised and resubmitted to *World Development*.
2. "The Impacts of Palm Oil Expansion on Deforestation and Economic Activity in the Eastern Amazon" with Ariaster Chimeli. Revised and resubmitted to *Ecological Economics*.
3. "Mapping Oil Palm Expansion and Environmental Impacts in the Eastern Amazon Using Machine Learning and Satellite Imagery" with Filipe Gomes Dias, José Alberto Quintanilha and Carlos Henrique Grohmann, forthcoming in *Remote Sensing Applications: Society and Environment*.
4. "The Relationship of Transportation Infrastructure and Deforestation in Brazil: a Machine Learning Approach", submitted to *Letters in Spatial and Resource Sciences*.
5. "Combining Artificial Intelligence and Satellite Imagery for Agricultural Disaster Prediction." *Revista Brasileira de Economia*, v. 77, p. e012023, 2023.
6. "Socioeconomic Development and Deforestation in the Cerrado biome, Brazil: spatial interactions and heterogeneity" with Alysson L. Stege, *Revista Brasileira de Estudos Regionais e Urbanos (RBERU)*, v. 15, p. 393–415, 2022.
7. "An Expanded Knowledge Production Function: Evidence from Brazil with a Dynamic Spatial Panel Approach" with Adirson M. Freitas Júnior, *Revista Brasileira de Inovação*, v. 20, p. 1-26, 2022.
8. "Cattle's expansion to the legal Amazon: spatial externalities, credit market access and intensification of production" with Adirson M. Freitas Júnior, *Nova Economia*, v. 31, p. 303-333, 2021.
9. "Expanding Access to Childhood Education in Brazil: what is the role of municipal public spending?" with Isadora S. Baggio and Adirson M. Freitas Júnior, *Revista Econômica do Nordeste*, v. 52 (2), p. 41-61, 2021.

10. "Distribuição Espacial da Inovação na Região Sul do Brasil de 2005 a 2015" with Adirson M. Freitas Júnior, Alysson Stege and Carlinton V. Santos, *Revista de Desenvolvimento Econômico*, v. 1, p. 31-59, 2021.
11. "Determinantes da Inovação na Região Sul do Brasil de 2004 a 2016: uma perspectiva partir das Leis Estaduais de Inovação" with Adirson M. Freitas Júnior and Cleise M. T. Hilgemberg, *Economic Analysis of Law Review*, v. 12, p. 614-634, 2021.
12. "The Socioeconomic Determinants of Crime in Brazil: the role of spatial spillovers and heterogeneity" with Hiago S. Baggio and Isadora S. Baggio, *Revista Brasileira de Segurança Pública*, v. 14, p. 188-209, 2020.
13. "Sistema de Aluguéis de Bicicleta como Política Pública: Externalidades Econômicas e Ambientais" with Adirson M. Freitas Júnior and Cleise M. T. Hilgemberg, *Economia em Revista*, v. 28, p. 99-112, 2020.
14. "Deforestation and Human Development in the Brazilian Agricultural Frontier: an Environmental Kuznets Curve for MATOPIBA" with Alysson Stege, *Revista Brasileira de Estudos Regionais e Urbanos (RBERU)*, v. 13, p. 161-182, 2019.
15. "Economic Development and Crime in Brazil: a multivariate and spatial analysis" with Isadora S. Baggio, Alysson Stege and Cleise M. T. Hilgemberg, *Revista Brasileira de Estudos Regionais e Urbanos (RBERU)*, v. 13, p. 1-22, 2019.
16. "Coffee Productivity and Regional Development in Brazil" with Renato A. Oliveira and Isadora S. Baggio, *Revista de Política Agrícola*, v. XXVIII, p. 76-91, 2019.
17. "Convergência do Desenvolvimento Tecnológico no Sul do Brasil: Uma Análise Espacial, com ênfase nos Efeitos Locais" with Adirson M. Freitas Júnior, Augusta P. Raiher and Alysson Stege, *Revista Brasileira de Inovação*, v. 18, p. 9-36, 2019.
18. "Curva Ambiental de Kuznets para a Mata Atlântica" with Adirson M. Freitas Júnior and Cleise M. T. Hilgemberg, *Economia em Revista*, v. 27, p. 24-34, 2019.
19. "Medium-sized Cities and Income Concentration in Paraná: The Inverted Curve of Kuznets" with Augusta P. Raiher, Emerson T. Hilgemberg, Adirson M. Freitas Júnior, Cleise M. T. Hilgemberg, *Economia & Região*, v. 7, p. 49-62, 2019.
20. "Análise da Contribuição das Universidades Estaduais Paranaenses na Geração de Inovação Tecnológica: Uma Perspectiva a Partir das Leis de Inovação" with Adirson M. Freitas Júnior and Cleise M. T. Hilgemberg, *Economia em Revista*, v. 26, p. 75-88, 2018.

WORKING PAPERS

1. "Do local institutions impact the environment? Evidence from deforestation in Brazil" with Ariaster Chimeli.
2. "The Indirect Effects of Soybean and Sugarcane Expansion in Brazil on the Deforestation of the Amazon Rainforest." with André Luis Squarize Chagas.
3. "The Human Capital Impacts the Agricultural Productivity and the Frontier Expansion? Evidence from Brazil" with Gustavo H. L. de Castro and Naercio Menezes-Filho.

4. "Controversies among the pioneers of economic development theory" with José Raymundo Novaes Chiappin.
5. "Relationship between Economic Growth and Deforestation in Brazil: the role of Spatial Spillovers and Heterogeneity."
6. "Does Location Matter? Evidence from Brazil's OG Concession Auctions" with Luzio, E.F. and Chagas, A.L.S.
7. "Soil Erosion Costs in Brazil" with T. S. Telles.
8. "The ABC Program's Role in Enhancing the Recovery of Degraded Pastures in Brazil" with T. S. Telles.
9. "Rural Credit and Conservation Agriculture in Brazil" with T. S. Telles.
10. "Is There a Trade-off between Economic Development and the Environment? Evidence from Deforestation in Brazil."
11. "The Environmental Impacts of the Agricultural Frontier Expansion in the Cerrado, Brazil" with Alysson L. Stege.

TEACHING

2020 Teaching assistant in econometrics at University of São Paulo.

2018 Teaching assistant in mathematics at University of Ponta Grossa.

AWARDS

2021 Carlos Azzoni Award, Brazilian Association of Regional and Urban Studies.