The Political Economy Of Amazon Deforestation: Subnational Development And The Uneven Reach Of The Colombian State

Javier Revelo-Rebolledo
University of Pennsylvania

Follow this and additional works at: https://repository.upenn.edu/edissertations

Part of the Latin American Languages and Societies Commons, Latin American Studies Commons, Political Science Commons, and the Urban, Community and Regional Planning Commons

Recommended Citation
https://repository.upenn.edu/edissertations/3511

This paper is posted at ScholarlyCommons. https://repository.upenn.edu/edissertations/3511
For more information, please contact repository@pobox.upenn.edu.
The Political Economy Of Amazon Deforestation: Subnational Development And The Uneven Reach Of The Colombian State

Abstract
The recent peace process between the Colombian government and the Revolutionary Armed Forces of Colombia (FARC) has prompted radical changes in the country’s Amazon region. A decrease in violence has been accompanied by an increase in deforestation, suggesting that good things do not always come together. My dissertation studies the political economy of Amazon deforestation through a cross-disciplinary analysis linking studies of modern state formation with tropical deforestation. As such, it offers an empirically grounded explanation for differential levels of deforestation in the Colombian Amazon. Employing a mixed-methods research strategy, I reviewed historical archives on regional development, interviewed more than ninety local leaders in the region, and produced an original geodatabase on cumulative forest loss. This empirical strategy allowed me to measure Amazonian deforestation since the 1970s and systematically compare Caquetá and Putumayo, which are the two most similar departments with different levels of cumulative deforestation. Based on this research design, this dissertation suggests that an explanation of different levels of cumulative deforestation needs to seriously consider both the degree and the type of territorial integration. Cumulative deforestation and territorial integration tend to be high in departments like Caquetá and Putumayo, which transitioned from extractive economies to agrarian colonization in the first decades of the twentieth century. Both cases were economically and politically similar until the mid-1950s, when their economic and political incorporation trajectories and corresponding levels of deforestation began to diverge as a result of the different integration strategies promoted by the Colombian state between 1948 and 1982 during the ‘developmental era’. Cumulative deforestation in Caquetá (compared to Putumayo) tends to be higher because both the state and market forces succeeded in establishing an integration trajectory based on the farming of livestock. This research has the potential to improve our understanding on the geopolitical drivers of Amazon deforestation. Contemporary explanations that emphasize the withdrawal of the FARC are incomplete insofar as they fail to recognize that the guerrilla organization used to be very influential in both departments and that deforestation in post-conflict Colombia has not increased equally. My dissertation also illustrates the necessity of avoiding the geographical determinism characteristic of much recent political science research and recognizing that geographical phenomena can sometimes be endogenous to the discipline’s most important variables of interest. An increasing interest in environmental issues has the potential to compel scholars and policy makers to better understand exactly how geography matters, both socially and politically.

Degree Type
Dissertation

Degree Name
Doctor of Philosophy (PhD)

Graduate Group
Political Science

First Advisor
Tulia G. Falleti

Keywords
Amazonia, Colombia, Conflict, Deforestation, Development, State Strength
Subject Categories
Latin American Languages and Societies | Latin American Studies | Political Science | Urban, Community and Regional Planning

This dissertation is available at ScholarlyCommons: https://repository.upenn.edu/edissertations/3511
THE POLITICAL ECONOMY OF AMAZON DEFORESTATION: SUBNATIONAL DEVELOPMENT AND THE UNEVEN REACH OF THE COLOMBIAN STATE

Javier Revelo-Rebolledo

A DISSERTATION

in

Political Science

Presented to the Faculties of the University of Pennsylvania

in

Partial Fulfillment of the Requirements for the

Degree of Doctor of Philosophy

2019

Supervisor of Dissertation

_____________

Tulia G. Falleti
The Class of 1965 Endowed Term Professor of Political Science

Graduate Group Chairperson

_____________

Alex Weisiger
Associate Professor of Political Science

Dissertation Committee

Rudra Sil, Professor of Political Science
Devesh Kapur, Starr Foundation Professor of South Asian Studies and Director of Asia Programs, Johns Hopkins University
THE POLITICAL ECONOMY OF AMAZON DEFORESTATION: SUBNATIONAL DEVELOPMENT AND THE UNEVEN REACH OF THE COLOMBIAN STATE

COPYRIGHT

2019

Javier Revelo-Rebolledo

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License

To view a copy of this license, visit

https://creativecommons.org/licenses/by-nc-sa/4.0/us/
For my Mom, my first teacher
ACKNOWLEDGMENTS

There were many people and organizations that made it possible for this thesis to come to fruition. First of all, I would like to thank Tulia Falleti, my thesis supervisor at the University of Pennsylvania. Her generous advice guided the elaboration of my dissertation at every stage: the delimitation of a novel object of study, the elaboration of a rigorous research project, the implementation of creative field work, and writing a clear and in-depth argument. I am particularly grateful for countless meetings and her detailed reading of every one of my drafts. Her work ethic, discipline and generosity, her analytical and methodological clarity, and her ability to identify weaknesses in my ideas, were fundamental inputs to find the difficult balance between theory and empirical research. I also would like to thank Rudra Sil and Devesh Kapur, the other two members of my doctoral committee. The three of them believed in this project from the beginning and encouraged me to study a relatively new topic in the discipline. Rudra Sil helped me develop and understand the theoretical, methodological and empirical contributions of this thesis. His comments allowed me to connect my research question with debates that transcended the region of study. I thank Devesh Kapur for asking the most difficult questions, which I doubt I have fully answered. If this thesis does not reproduce many problems of contemporary environmentalism, it is, to a large extent, thanks to his deep understanding of rural economies in developing countries. Naturally, the errors are my responsibility.

This dissertation would not have been possible without the vital support of many members and departments of the University of Pennsylvania. I am particularly grateful to the School of Arts and Sciences, the Andrea Mitchell Center for the Study of Democracy (former Program for Democracy, Citizenship, and Constitutionalism), the Latin American and Latino Studies, and the Christopher H. Browne Center for International Politics for their generous financial and institutional support. I also want to thank Professors Rogers Smith, Jeffrey Green, Robert Vitalis and Dorothy Kronick, who have always contributed to my academic career even without being part of the doctoral committee. In Penn, I also had the fortune to make new friends and develop my ideas with them from the early stages. I am grateful to Osman Balkan, Matthew Berkman, Guzman Castro, Santiago Cunial, Victoria Gilbert, Ashley Gorham, Matthew Kavanagh, Sergio Mukherjee, Prakirti Nangia, Isabel Perera, Thea Riofrances, Nathaniel Shils, Zachary Smith, and Joanna Wuest for so many enriching conversations. I owe a special thanks to Aniruddha Jairam, Carly Regina, Yu Zeng and Robinson Woodward-Burns, my intercultural family in Philadelphia. Thank you for opening the doors of your worlds and for teaching me that it is possible to live with our differences. All you need is love or, at least, to let others be.

In Colombia my debts are many. Firstly, I thank the state officials and social leaders who generously shared their perceptions and life experiences with me. They showed me the importance of considering the legacies of the past and doubting about over simplistic statements. I sincerely hope that the peace experienced in the region while I implemented my fieldwork can become a consolidated reality.
My debts in Colombia go beyond this doctoral thesis. I thank the Center for the Study of Law, Justice and Society (Dejusticia) for teaching me that academic research should be socially relevant. My work with professors Rodrigo Uprimny, Juan Jaramillo, César Rodríguez, and Mauricio García Villegas was particularly influential. I owe Mauricio a special thank you for believing in me and for closely accompanying my academic process for more than one decade. Thank you for teaching me that the sociology of law and political sociology have much in common and that, in countries like Colombia, the study of territorial unevenness is paramount to understanding state power. In Dejusticia I also met good friends, among whom I remember with much gratitude Carlos Baquero, Carolina Bernal, Aura Bolívar, Camilo Castillo, Sergio Chaparro, Luis Felipe Cruz, Natalia Duarte, Diana Guarnizo, Diana Güiza, Diana Guzmán, Sebastián Lalinde, Miguel La Rota, Vivian Newman, Natalia Orduz, Juliana Poveda, Paula Rangel, Diana Rodríguez, María Paula Saffón, Camilo Sánchez, Luz María Sánchez, Nathalia Sandoval, Nicolás Torres and Carolina Villadiego.

Likewise, two organizations were key in the development of this thesis. The Center for Research and Popular Education (CINEP) gave me the opportunity to mature my ideas while making new friends. I want to especially thank Fernán González, Andrés Aponte, Víctor Barrera, Ingrid Bolívar, Lorena Carrillo, Camila Carvajal, Sergio Coronado, Laura Henao, Charles Larrat-Smith, Silvia Otero, and Teófilo Vásquez. They helped me to counteract deductive, decontextualized and normative thinking, and to understand a region that was deeply impacted by the conflict. Similarly, in the Electoral Observation Mission (MOE) I had the opportunity to understand both the institutional reforms resulting from the implementation of the peace agreement and their possible regional impacts. In particular, I want to thank Alejandra Barrios, Camilo Mancera, Camilo Vargas, Marlon Pabón, Germán Robayo and Luisa Salazar.

I am also grateful to professors and students of the Faculty of Law of the Universidad Cooperativa de Pasto, especially "La Minga" research group. Professors Diana Isabel Molina, Hugo Medina, Romel Hernández, Jimmy Ruíz, Mauricio Chamorro and Franco Ceballos, and students Leidy Bolaños, Cristian Polo, Santiago Dorado, and Francisco Gutiérrez welcomed me and supported me with great generosity during different moments of this project.

Many professors and researchers kindly shared their ideas with me. I am grateful for the comments of Tatiana Alfonso, Isabella Alcañiz, Ana Arjona, Paulo Bacca, Andrés Baquero, Sandra Botero, Nicolás Ceballos, Alejandra Ciro, Estefanía Ciro, Eduardo Dargent, Ann Farnsworth-Alvear, Belén Fernández, Miguel García, Ricardo Gutiérrez, Kathryn Hochstetler, Catherine Legrand, Paula Muñoz, Rocio Peña, Juan Diego Prieto, René Provost, Roberto Ramírez, María Clemencia Ramírez, Andrés Abel Rodríguez, Juan Carlos Rodríguez, César Sánchez, Eduardo Silva, Hillel Soifer, Simón Uribe, Laura Wills, and Vishakha Wijenayake. I also want to thank Arun Agrawal, Kiran Asher, Nicholas Blomley, Rodrigo Botero, Jonah Busch, Oliver Coomes, Ivonne Cueto, Ann Norton Greene, Sébastien Jodoin, Claudia Leal, Diego Lugo, Kristina Lyons, Diana Ojeda, Germán Palacio, Natalia Pérez, Irene Piedrahita, Thomas Rudel, James Scott,
Jonathan Schwartz, Jon Unruh, María Alejandra Vélez, and Carlos Zárate, who helped me understand the socio-political dimension of contemporary environmental problems.

During all these years I had the help of superb research assistants, whose work allowed me to combine different sources of data. I want to thank Julieta Montilla, Daniel Velandia, Diana Cortés and Andrés Ospina, who helped me systematize some of the historical information, and María Victoria Alfonso, María Fernanda Jiménez and Laura Useche, for their help clarifying specific issues with regard to environmental institutions. I owe a special thanks to the engineer Nicolás Herrera. His skills with Geographical Information Systems not only showed me the importance of promoting interdisciplinary dialogues, but also made the construction of both the database and the maps possible. I also want to thank Osman Roa, who supervised the early stages of this process in a disinterested way. Likewise, I thank Matthew Berkman, Jeffrey Winchell, Charles Larrat-Smith and Glenn Ojeda for their careful reading and detailed correction of different parts of the text.

To my uncles, aunts, cousins and friends, to the companions of life, I thank you all for your patience. There are many moments that we have not shared due to this thesis. I hope and trust that the coming years will be different. To my mother, Piedad Rebolledo, the light of my life: we did it. Thank you for your unconditional support and for always encouraging me to ask critical questions. I had the opportunity of travelling with her through southern Colombia and studying the environmental problems associated with road construction. During these trips I understood that urban environmentalism is not only irrelevant but can be very harmful if it does not pay special attention to the specific needs of people. Finally, I do not have enough words to thank Maya Ceballos, my accomplice on this journey. Her sharp questions and comments, her editorial help and, above all, her laughter and energy gave me the strength to close this cycle without losing my sanity.
ABSTRACT

THE POLITICAL ECONOMY OF AMAZON DEFORESTATION: SUBNATIONAL DEVELOPMENT AND THE UNEVEN REACH OF THE COLOMBIAN STATE

Javier Revelo-Rebolledo

Tulia Falleti

The recent peace process between the Colombian government and the Revolutionary Armed Forces of Colombia (FARC) has prompted radical changes in the country’s Amazon region. A decrease in violence has been accompanied by an increase in deforestation, suggesting that good things do not always come together. My dissertation studies the political economy of Amazon deforestation through a cross-disciplinary analysis linking studies of modern state formation with tropical deforestation. As such, it offers an empirically grounded explanation for differential levels of deforestation in the Colombian Amazon. Employing a mixed-methods research strategy, I reviewed historical archives on regional development, interviewed more than ninety local leaders in the region, and produced an original geodatabase on cumulative forest loss. This empirical strategy allowed me to measure Amazonian deforestation since the 1970s and systematically compare Caquetá and Putumayo, which are the two most similar departments with different levels of cumulative deforestation. Based on this research design, this dissertation suggests that an explanation of different levels of cumulative deforestation needs to seriously consider both the degree and the type of territorial integration. Cumulative deforestation and territorial integration tend to be high in
departments like Caquetá and Putumayo, which transitioned from extractive economies to agrarian colonization in the first decades of the twentieth century. Both cases were economically and politically similar until the mid-1950s, when their economic and political incorporation trajectories and corresponding levels of deforestation began to diverge as a result of the different integration strategies promoted by the Colombian state between 1948 and 1982 during the ‘developmental era’. Cumulative deforestation in Caquetá (compared to Putumayo) tends to be higher because both the state and market forces succeeded in establishing an integration trajectory based on the farming of livestock. This research has the potential to improve our understanding on the geopolitical drivers of Amazon deforestation. Contemporary explanations that emphasize the withdrawal of the FARC are incomplete insofar as they fail to recognize that the guerilla organization used to be very influential in both departments and that deforestation in post-conflict Colombia has not increased equally. My dissertation also illustrates the necessity of avoiding the geographical determinism characteristic of much recent political science research and recognizing that geographical phenomena can sometimes be endogenous to the discipline’s most important variables of interest. An increasing interest in environmental issues has the potential to compel scholars and policy makers to better understand exactly how geography matters, both socially and politically.
TABLE OF CONTENTS

ACKNOWLEDGMENTS............................................................................................... IV
ABSTRACT..................................................................................................................... VII
LIST OF TABLES...........................................................................................................XIII
LIST OF FIGURES........................................................................................................ XIV
LIST OF ABBREVIATIONS.......................................................................................... XVI

CHAPTER 1. INTRODUCTION.......................................................................................1
1.1. Peace vs Forests?................................................................................................. 1
1.2. The Why and How of Amazon Deforestation Beyond the Enforcement Paradigm.................................................................................................................. 6
1.3. Amazon Deforestation in Colombia....................................................................... 13
1.4. Research Design and Methodological Approach.................................................... 15
  1.4.1. The Study of Deforestation and Integration....................................................... 15
  1.4.2. Data................................................................................................................ 21
1.5. Why Study Amazon Deforestation and Why in Political Science? .................... 26
  1.5.1. A Key Component of the Contemporary Ecological Challenge....................... 26
  1.5.2. The Study of Amazon Deforestation in Political Science: Justification and Contributions.................................................................................................................. 31
1.6. Argument in Brief................................................................................................. 38
  1.6.1. Cumulative Deforestation Results from Degree of Integration......................... 38
  1.6.2. Cumulative Deforestation Results from Type of Integration............................. 40
1.7. A Roadmap........................................................................................................... 43

CHAPTER 2. DEFORESTATION, STATE UNEVENNESS, AND THE ECOLOGY OF BROWN ZONES........................................................................................................45
2.1. Introduction.......................................................................................................... 45
2.2. Literature on Amazon Deforestation and the Role of Politics.............................. 47
  2.2.1. Defining Deforestation, Agrarian Colonization and the Study of Cumulative Deforestation ............................................................................................................. 47
  2.2.2. The Main Drivers of Tropical Deforestation..................................................... 49
  2.2.3. An Emerging Field on The Politics of Deforestation....................................... 55
  2.2.4. Amazon Deforestation.................................................................................... 59
2.3. Beyond the Enforcement Paradigm: Dimensions of State Power......................... 61
2.3.1. Scratching the Surface: The Enforcement Paradigm

2.3.2. First Step Back: The Infrastructural Power of the State and the Concept of Territorial Integration

2.3.3. Second Step Back: State Territorial Reach

2.3.4. Third and Final Step Back: The Scope of the State

2.4. Green is the New Brown

2.4.1. States Have Many Brown Zones

2.4.2. Brown Zones Resulting from Varied Ecologies

2.4.3. Amazonia: A Brown Zone that Could Be Modified

2.5. Conclusion

CHAPTER 3. A THEORETICAL PROPOSAL ON THE STATE AND AMAZON DEFORESTATION

3.1. Introduction

3.2. An Overview: Deforestation and Integration

3.3. Integration as an Underlying Driver of Amazon Deforestation

3.3.1. Understanding the Amazon’s Brownness

3.3.2. The Short-term Effect: Agrarian Colonization as Creative Destruction

3.3.3. The Long-term Effect: State Embeddedness in Agrarian Colonization

3.3.4. State Reach and Agrarian Colonization

3.3.5. Territorial Integration through Non-Developmental Agendas

3.4. Types of Integration: Cumulative Deforestation Among Integrated Areas

3.4.1. From Degrees to Types of Integration

3.4.2. Pre-conditions: Changing Strategic Interests and Initial Agrarian Colonization


3.4.4. Integration Trajectories during the Neoliberal Era (1982-Present)

3.4.5. The Legacies for Advancing Environmental Policies

CHAPTER 4. BEFORE DIVERGENCE: INCREASING DEGREES OF INTEGRATION ON SIMILAR PATHS

4.1. Introduction
4.2. Geographic and Early Developmental Similarities Between Caquetá and Putumayo...

4.2.1. Biophysical Characteristics

4.2.2. Integration Trajectories Before the Late Nineteenth Century

4.3. Increasing Degrees of Economic and Political Integration (1850s-1932)

4.3.1. Economic Integration Through Extractive Economies

4.3.3. The Advancement of Agrarian Colonization

4.4. From the Colombian-Peruvian War to La Violencia

4.4.1. The Outbreak of the 1932 War

4.4.2. Agrarian Colonization’s Dynamism After the War

4.4.3. La Violencia’s Impact in the Amazonian Piedmont

4.5. Conclusion

CHAPTER 5. A CRITICAL JUNCTURE: SHAPING THE TWO TYPES OF INTEGRATION AND DEFORESTATION DURING THE DEVELOPMENTAL ERA

5.1. Introduction

5.2. Cumulative Deforestation in the Amazonian Foothills


5.3.1. A Demographic and Developmental Big Push

5.3.2. Integration Through the Agrarian Agenda

5.3.3. The Role of the Market: Nestlé’s Dairy District

5.3.4. A Consolidated Livestock Economy in Constant and Rapid Expansion

5.3.5. Caquetá Reaches “Adulthood”

5.4. Putumayo: Integration Through the Extractive Agenda

5.4.1. Integration Through Oil Extraction

5.4.2. Early Contraction and Delayed “Adulthood”

5.5. Path Dependency in Neoliberal Times (1982-)

5.5.1. The Withdrawal of the State

5.5.2. Integration Through Coca Cultivation

5.5.3. The Empowerment of the Non-developmental Agendas of the State

5.6. Conclusion
CHAPTER 6. DIVERSE LEGACIES IN THE AMAZONIAN FOOTHILLS……225
6.1. Introduction .................................................................................................................. 225
6.2. Current Environmental Issues in Caquetá and Putumayo........................................ 227
   6.2.1. The Expansion of the Agricultural Frontier......................................................... 228
   6.2.2. The Expansion of the Extractive Frontier............................................................ 231
6.3. The Political Economy of the Environment in the Amazonian Foothills .............. 232
   6.3.1. The Political Economy of the Environment in Caquetá .................................... 233
   6.3.2. The Political Economy the Environment in Putumayo..................................... 244
6.4. The Moral Economy ................................................................................................... 249
   6.4.1. The Dominant Moral Economy of Caquetá......................................................... 251
   6.4.2. The Dominant Moral Economy of Putumayo..................................................... 260
6.5. Conclusion .................................................................................................................. 265

CHAPTER 7. CONCLUSIONS AND IMPLICATIONS......................................................... 268
7.1. Introduction ................................................................................................................ 268
7.2. Contributions: Deforestation in the Amazon, Subnational Development, and STR.. 269
7.3. Alternative Explanations ............................................................................................ 271
7.4. Limitations: The Road Ahead .................................................................................... 274
   7.4.1. From Hypothesis Generating to Hypothesis Testing ........................................... 274
   7.4.2. Do the Findings Travel? ...................................................................................... 276
7.5. Implications ................................................................................................................ 278
   7.5.1. State Detachment and Dislocation ..................................................................... 278
   7.5.2. Dealing with the Legacies of the Developmental Era ......................................... 280
   7.5.3. The Environment for Peace and Peace for the Environment ............................. 282
   7.5.4. A New Developmental Critical Juncture? .......................................................... 286

APPENDIX A. MAPPING CUMULATIVE DEFORESTATION ............................... 290
APPENDIX B. HISTORICAL ARCHIVES .............................................................. 307
APPENDIX C. IN-DEPTH INTERVIEWS ............................................................. 308
BIBLIOGRAPHY .............................................................................................................. 314
LIST OF TABLES

Table 1.1. Deforestation Articles in Political Science and International Relations .......... 32
Table 2.1 State Agendas, Institutions, and Orientations Towards Development .......... 79
Table 3.1 Sectoral Agendas of the State and State Reach in the Amazon over Time .... 122
Table 3.2 Two Integration Trajectories in the Amazonian Foothills Through the Developmental Agendas of the State ............................................................................. 126
Table 3.3 The Legacies of Different Types of Integration ........................................ 138
Table 5.1. The INCORA’s Investments in Colonization Regions (1961-1980) ............ 187
Table 5.2 Nestle’s Dairy Market in Caquetá ................................................................. 192
Table 6.1 Official Symbolism in Caquetá ...................................................................... 253
Table 6.2 Official Symbolism in Putumayo ................................................................. 261
LIST OF FIGURES

Figure 1.1. The Colombian Amazon region in context ........................................ 2
Figure 1.2. Annual deforestation by country in the Andean Amazon ............ 3
Figure 1.3. Integration and cumulative deforestation in the Colombian Amazon 17
Figure 1.4. Processed Landsat images .............................................................. 25
Figure 2.1. The institutional antecedents of law enforcement research ........ 62
Figure 2.2. Varieties of STR ........................................................................ 75
Figure 2.3. Forest cover and indirect rule in Colombia ................................ 89
Figure 3.1. Amazon deforestation resulting from degree and type of integration 97
Figure 3.2. Understanding the linkage between deforestation and degree of integration 101
Figure 3.3. Cumulative deforestation and economic and political integration in the Colombian Amazon .......................................................... 107
Figure 3.4. Cumulative deforestation and political integration over time in the Amazonian piedmont ................................................................. 109
Figure 3.5. Allocated public land to private hands in the Colombian Amazon by department ................................................................. 118
Figure 3.6. Land-use planning institutions in the Colombian Amazon ........... 121
Figure 4.1. Towns founded or re-founded by the Capuchin monks (1905-1925) 155
Figure 4.2. Puerto Asís in 1933. A boat to transport freight and soldiers to the Guepí campaign .............................................................. 161
Figure 4.3. Population and population density in Caquetá and Putumayo (1928-1973) 166
Figure 4.4. Homicide rate in ejecting regions (1946-1960) ......................... 167
Figure 4.5. Origin of Caquetá, Putumayo, and Meta’s migrants ..................... 168
Figure 5.1. Cumulative deforestation and regrowth in the Amazonian piedmont (1970-2016) ................................................................. 175
Figure 5.2. Non-forest land area per (rural) capita in Caquetá and Putumayo 177
Figure 5.3. Population in Caquetá (1928-2005) ............................................ 179
Figure 5.4. Allocated public land in Caquetá over time .............................. 183
Figure 5.5. The organization of the milk market in Caquetá: dairy routes 190
Figure 5.6. Total livestock in Caquetá (1959-2018) .................................. 193
Figure 5.7. Population in Putumayo (1928-2005) ....................................... 203
Figure 5.8. Allocated public land in Putumayo over time .......................... 206
Figure 5.9. Produced barrels of oil in Putumayo (1969-1986) ..................... 209
Figure 5.10. Population increase by period and department ...................... 216
Figure 5.11. National Parks and indigenous reservations in Caquetá and Putumayo over time .......................................................... 219
Figure 6.1. Most salient environmental issues in the Colombian Amazon foothills .... 228
Figure 6.2. Annual deforestation, coca crops and livestock inventory by department .............................................................. 229
Figure 6.3. Farms by number of animals in Caquetá and Putumayo (2018) 235
Figure 6.4. The destruction of community-built roads by local residents 243
Figure 6.5. Four examples of coats of arms in Caquetá.............................................. 254
Figure 6.6. Old and new coat of arms of Florencia, the capital city of Caquetá ............ 259
Figure 6.7. Three examples of coats of arms in Putumayo.......................................... 263
Figure 6.8. Putumayo’s flag....................................................................................... 264
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>National Land Agency (<em>Agencia Nacional de Tierras</em>)</td>
</tr>
<tr>
<td>AUC</td>
<td>United Self-Defense Forces of Colombia (<em>Autodefensas Unidas de Colombia</em>)</td>
</tr>
<tr>
<td>Banco Ganadero</td>
<td>Livestock Bank (<em>Banco Ganadero</em>)</td>
</tr>
<tr>
<td>Caja</td>
<td>Agricultural Credit Bank (<em>Caja Agraria</em>)</td>
</tr>
<tr>
<td>CECORA</td>
<td>Agrarian Reform Cooperative Center Ltd. (<em>Central de Cooperativas de la Reforma Agraria Ltda</em>)</td>
</tr>
<tr>
<td>CIAT</td>
<td>International Center for Tropical Agriculture (<em>Centro Internacional de Agricultura Tropical</em>)</td>
</tr>
<tr>
<td>CNMH</td>
<td>National Centre for Historical Memory (<em>Centro Nacional de Memoria Histórica</em>)</td>
</tr>
<tr>
<td>COOPERAGRO</td>
<td>Multiactive Cooperative of Workers and Pensioners of Establishments of the Ministry of Agriculture and Others (<em>Cooperativa Multiactiva de Trabajadores y Pensionados de Establecimientos del Ministerio de Agricultura y Otros</em>)</td>
</tr>
<tr>
<td>CORPOAMAZONIA</td>
<td>Corporation for Sustainable Development in the Southern Amazon (* Corporación para el Desarrollo Sostenible del Sur de la Amazonía*)</td>
</tr>
<tr>
<td>DAINCO</td>
<td>Administrative Department of Intendancies and Commissariats (<em>Departamento Administrativo de Intendencias y Comisarias</em>)</td>
</tr>
<tr>
<td>DANE</td>
<td>National Administrative Department of Statistics (<em>Departamento Administrativo Nacional de Estadística</em>)</td>
</tr>
<tr>
<td>FARC</td>
<td>Revolutionary Armed Forces of Colombia (<em>Fuerzas Armadas Revolucionarias de Colombia</em>)</td>
</tr>
<tr>
<td>Short Form</td>
<td>Full Name</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>FEDEGAN</td>
<td>National Federation of Cattle Farmers (Federación Colombiana de Ganaderos)</td>
</tr>
<tr>
<td>HIMAT</td>
<td>Colombian Institute for Hydrology, Metereorology and Land Development (Instituto Colombiano de Hidrología, Meteorología y Adecuación de Tierras)</td>
</tr>
<tr>
<td>ICA</td>
<td>Colombian Agricultural Institute (Instituto Colombiano Agropecuario)</td>
</tr>
<tr>
<td>IDEAM</td>
<td>Institute of Hydrology, Meteorology and Environmental Studies (Instituto de Hidrología, Meteorología y Estudios Ambientales)</td>
</tr>
<tr>
<td>IDEMA</td>
<td>Agricultural Marketing Institute (Instituto de Mercadeo Agropecuario)</td>
</tr>
<tr>
<td>IGAC</td>
<td>Agustin Codazzi Geographic Institute (Instituto Geográfico Agustín Codazzi)</td>
</tr>
<tr>
<td>INCADER</td>
<td>Colombian Institute for Rural Development (Instituto Colombiano de Desarrollo Rural)</td>
</tr>
<tr>
<td>INCORA</td>
<td>Colombian Institute for Agrarian Reform (Instituto Colombiano para la Reforma Agraria)</td>
</tr>
<tr>
<td>INDERENA</td>
<td>National Institute of Renewable Natural Resources and Environment (Instituto Nacional de los Recursos Naturales Renovables y del Ambiente)</td>
</tr>
<tr>
<td>M-19</td>
<td>19th of April Movement (Movimiento 19 de abril)</td>
</tr>
<tr>
<td>PDET</td>
<td>Development Programs with a Territorial Approach (Programas de Desarrollo con Enfoque Territorial)</td>
</tr>
<tr>
<td>SIAC</td>
<td>Environmental Information System of Colombia (Sistema de Información Ambiental de Colombia)</td>
</tr>
<tr>
<td>SIATAC</td>
<td>Territorial Environmental Information System of the Colombia Amazon (Sistema de Información Ambiental Territorial de la Amazonía Colombiana)</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Name</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>SIGOT</td>
<td>Geographic Information System for the National Planning and Territorial Structure (Sistema de Información Geográfica para el Ordenamiento Territorial)</td>
</tr>
<tr>
<td>SINCHI</td>
<td>Amazonian Institute of Scientific Research (Instituto Amazónico de Investigaciones Científicas)</td>
</tr>
<tr>
<td>TEXACO</td>
<td>Texas Petroleum Company</td>
</tr>
<tr>
<td>UASPNN</td>
<td>Special Administrative Unit of the Network of National Natural Parks of Colombia (Unidad Administrativa Especial de Parques Naturales)</td>
</tr>
<tr>
<td>USAID</td>
<td>United State Agency for International Development</td>
</tr>
</tbody>
</table>
CHAPTER 1. INTRODUCTION

“The state is a Janus about which it is impossible to state a positive property without simultaneously stating a negative property... a progressive property without a regressive and oppressive property. This is troubling for those people who like to think that everything will turn out rosy.” Pierre Bourdieu (2014, p. 98)

1.1. Peace vs Forests?

In September 2016, the Colombian government and the FARC guerrilla movement finally reached a peace agreement after a four-year peace process. When the agreement was still under negotiation, the United Nations Development Program and Colombia’s National Planning Office organized a public forum to debate “The Environmental Dividends of Peace.” Former Colombian president Juan Manuel Santos was invited to this forum and, as expected, delivered a talk highlighting the benefits of peace. In addition to promoting economic development and public safety, Santos (2016) argued, peace “will give us the greatest environmental dividends.” The logic of his presentation was simple: since violence was a cause of environmental degradation, peace would restore the environment to health. The environment was presented as a casualty of violence; one whose misery was about to end. Without violence, Santos added, peasants would not clear land to cultivate coca, insurgents would become guardians of the forest, the army would allocate additional resources to fighting environmental degradation, and the government would eradicate coca crops, develop marginalized areas, and protect additional lands. The Colombian Amazon, which is located in the northwestern corner of region, would flourish (see Figure 1.1).
Santos’ optimistic appraisal of the relationship between peace and the environment is not unique. In fact, it reflects a common view according to which a virtuous cycle links peace, development, and environmental protection. The 1992 Rio Declaration on Environment and Development is perhaps the most prominent example of this position. Warfare, the Declaration states, is “inherently destructive” of sustainable development (Principles 15 and 24). Because “peace, development and environmental protection are interdependent and indivisible,” environmental degradation is the result of mismanaged or non-sustainable development (Principle 25). This common view presents the development of the modern state—one capable of governing its territories—as a
crucial means to resolving most social problems, including environmental ones. The modern state is conceived as a problem-solving organization, implying that environmental problems are the direct result of impediments to state consolidation (e.g., violence, corruption, poverty, undefined property rights, etc.).

Soon after the FARC demobilized, however, Amazon deforestation began to increase. The Colombian Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM) has repeatedly shown that deforestation in the Colombian Amazon, a region where the FARC was once very influential, has accelerated since 2016 (e.g., Ramírez, 2011; Vásquez, Vargas, & Restrepo, 2011). Figure 1.2 clearly depicts these
transformations, which pose difficult questions for the idea of environmental peace dividends in the Colombian Amazon.

In light of these transformations, I argue that Colombia is a crucial case for exploring the relationship between state strength and environmental degradation (Alcañiz & Gutiérrez, 2018; Schwartz, 2003; Slough & Urpelainen, 2019). The primary objective of my dissertation is to examine that relationship both theoretically and empirically by linking political science research on the modern territorial state with environmentalist knowledge about tropical deforestation.

The idea of a virtuous cycle linking the strength of the state with environmental protection has limited purchase when it comes to explaining countries like Colombia, where environmental degradation has increased following a relatively successful peace process—one that both fortified the state’s monopoly on violence (Weber, 1968) and enhanced its infrastructural power (Mann, 1984).¹ If environmental problems are problems of state weakness, as the common view assumes, then one would expect better environmental outcomes in post-conflict Colombia, where the state has been historically weak. Why, then, does Colombia defy this popular view? What can the Colombian case tell us about the role of the modern territorial state in tropical deforestation? Is state strength or weakness a driver of deforestation? How does the strength of the state prevent or promote deforestation?

¹ Colombia is usually considered a clear example of state weakness in Latin America and the developing world. See for instance (Centeno 2002; Saylor, 2014; Soifer, 2015).
This thesis suggests that the relationship between deforestation and the modern state needs to consider two antecedent dimensions of state strength and the politics of enforcement. These dimensions emphasize the importance of both the territorial reach of the state and state functions. Based on basic claim, I propose that cumulative deforestation results from a macro process of economic, political and cultural integration, which in Colombia mostly occurred during the twentieth century. In this sense, cumulative deforestation is highest in the Amazonian provinces that are highly integrated. Furthermore, among the provinces that are highly integrated, my thesis suggest that cumulative deforestation is highest where the state actively promoted the consolidation of commercial farming vis-à-vis other economic sectors during the developmental era. Therefore, cumulative deforestation results from different degrees and types of integration, which in turn have left entrenched economic, political and cultural legacies that strongly constrain the possibilities of advancing an environmental agenda in the different regions of the Colombian Amazon.

This chapter is divided into seven sections. The second section introduces the object of study: the relationship between the modern state and Amazon deforestation. The third section provides a general overview of Amazon deforestation and its drivers in Colombia. The fourth section presents the basic characteristics of my research design and methodological approach. The fifth section defends the importance of studying Amazon deforestation, and establishes its relevance to political science debates. In the final two sections, I summarize the dissertation’s core argument and provide an overview of subsequent chapters.
1.2. The Why and How of Amazon Deforestation Beyond the Enforcement Paradigm

Journalists, environmental activists, and researchers in Colombia have begun to explore political and economic explanations for deforestation in Amazonia after the FARC’s demobilization. A strong hypothesis has emerged according to which Amazon deforestation has increased due to the absence of political authority in regions previously controlled by the FARC. Post-conflict Amazonia, then, is characterized as a lawless territory; the withdrawal of the FARC has created a “power vacuum” that explains not only recent decline in violence but also spiking deforestation rates. According to Rodrigo Botero, a former director of the Amazon division of the Colombian National Parks Unit, “although deforestation is absolutely serious, there is a more complex issue underlying deforestation, which is the loss of territorial sovereignty by the Colombian state... It is a problem for the state as a whole” (interview 13).

Underpinning the connection between deforestation and post-conflict lawlessness is a modified version of the abovementioned view of a virtuous cycle said to link development, peace, and environmental protection. If peace is expected to yield environmental dividends, then increasing deforestation following a peace agreement can only be explained as the result of widespread illegality and crime. José Yunis Mebarak (2018), the coordinator of a novel state program whose objective is to protect the Amazon region (Visión Amazonía), provides a clear summary of this view. According to Mebarak,

---

2 See, for example, Baena (2017), Cote (2017), López (2018), Reilly and Parra (2019) and Zarama (2019).
3 Some even claim that formerly FARC-controlled regions have witnessed a descent into “criminal anarchy” (Ávila & Londoño, 2017).
What is happening is illegal, immoral and irrational. It is illegal because they are appropriating land that belongs to all Colombians with fires that are prohibited in our country... It is immoral because they have no right or reason to burn every animal, plant, and living species without differentiation... It is irrational because they destroy the regulatory force of the climate.

Amazon deforestation is thus portrayed as a consequence of anarchy, negligence, greed, and illegality. At first glance, the idea is appealing because, like many developing countries, Colombia has passed numerous environmental laws over the past four decades with the aim of regulating and punishing the misuse of natural resources (Amaya, 2002; Maya-Aguirre, 2018). If, despite the introduction of comprehensive and ambitious environmental laws and constitutional provisions, deforestation not only continues but increases, practitioners and scholars have good reason to construe the problem as a lack of law enforcement. And indeed, contemporary policy debates on Amazon deforestation tend to accept that Santos’ environmental peace dividends have not reached Amazonia due to insufficient enforcement—a view I refer to as the “enforcement paradigm.”

The enforcement paradigm is much more than a theory, however. Given increasing deforestation rates, the Colombian government is steadily enhancing and re-directing its enforcement capabilities to prosecute the ranchers, peasants, and coca growers who are deforesting Amazonia. It is accepted that deforesters must incur “exemplary sanctions.” For instance, in November 2018, the Office of the Attorney General and the Police launched a massive operation the first of its kind to confiscate cattle and expel cattle ranchers who were occupying the Picachos National

---

4 By conceiving Amazon deforestation as an enforcement issue, journalists, environmental activists, and researchers end up debating whether the problem results from a lack of capacity or a lack of political will.  
5 The Colombian Congress is currently considering a reform of the Criminal Code that would increase penalties for deforestation.
The park is located in the highlands of San Vicente del Caguán, a municipality where the FARC was influential until 2016. Police actions quickly triggered protests and riots by locals who felt threatened by anti-deforestation enforcement activity that, according to them, did not take their needs into consideration (El Espectador, 2018). These events illustrate how, in the wake of the peace accords, the Colombian Amazon region has witnessed an increase in deforestation, public attention, law enforcement activity, and social conflict, all of which are quickly transforming the region and the political economy of deforestation.

Naturally, the paradigm that associates tropical deforestation with a lack of law enforcement is not unique to Colombia. The enforcement paradigm permeates political and academic debates in other tropical countries and has become a commonplace among scholars of state-led environmental strategies (Burgess, Hansen, Olken, Potapov, & Sieber, 2012; Schwartz, 2003). A clear example of the enforcement paradigm is Mark Ungar’s recent edited volume on state action in the Amazon region, whose subtitle is *Environmental Enforcement in the World’s Biggest Rainforest* (2018). The book explores environmental problems in each Amazonian country and emphasizes the persistence of law enforcement limitations everywhere.

Similarly, recent studies of tropical deforestation in political science have focused on the problem of enforcing anti-deforestation policies (Alcañiz & Gutiérrez, 2018; Fernández & Garay, 2019; Slough & Urpelainen, 2019). These studies tend to accept the

---

6 As in many developing countries, in Colombia the occupation of a protected area is prohibited unless the area overlaps with an indigenous territory (Decree 622/1977, art. 7).
idea that deforestation results from a lack of enforcement, although the particular factors that explain variation in enforcement dynamics differ. Slough and Urpelainen (2019, p. 3) capture the way the phenomenon tends to be perceived: “the scale and visibility of deforestation in the Brazilian Amazon represents a direct consequence of the state’s inability or unwillingness to enforce laws against deforestation.”

The enforcement paradigm benefits theoretically from the reasonable expectation that state strength is essential for achieving most socially-valued outcomes (Centeno, Kohli, Yashar, & Mistree, 2017). Common wisdom, based on comparative scholarship, holds that the strength of the state is either a good in itself or an important factor in promoting essential outcomes such as economic development, democratization, public order, poverty and crime reduction, and so forth. The expectation is even stronger among scholars who study developing countries, where the negative consequences of state weakness are felt by people in their everyday lives (Acemoglu & Robinson, 2012; García Villegas & Espinosa, 2013; Kohli, 2004). In light of the reality that political interest in preventing deforestation has steadily risen since the late 1970s while successes remain elusive, it is tempting to conclude that Amazon deforestation is principally a problem of law enforcement and state weakness.

My dissertation takes issue with both the assumption of a positive relationship between state strength, peace, and forest conservation and the view that reduces the role of the modern territorial state to effective enforcement and implementation of environmental policies (Alcañiz & Gutiérrez, 2018; Fernández & Garay, 2019; Schwartz,

---

2003; Slough & Urpelainen, 2019; Ungar, 2018). To be sure, I do not argue that the enforcement paradigm is completely inaccurate. It not only has some explanatory value after all deforestation tends to happen where the state is weakest and therefore law enforcement is challenging but also points in the right direction: deforestation dynamics in Amazonia are closely related to first-order concerns about state territoriality.

My dissertation assumes a broader conception of the state that is not solely focused on enforcement capacities. In addition, it focuses on the socio-political drivers of Amazon deforestation, an environmental phenomenon that directly touches on two defining features of the modern state: territory and violence (e.g., Foucault, 1991; Spruyt, 1994; M. Weber, 1968). It was Max Weber who famously defined the state as “the form of human community that (successfully) lays claim to the monopoly of legitimate physical violence within a particular territory,” noting that “this idea of ‘territory’ is an essential defining feature” of the state (2004, p. 33).

On the basis of this broader conception, I maintain that enforcement paradigm is insufficient to comprehend the complex relationship between the modern territorial state and deforestation. Enforcement issues represent only the surface of the problem dynamics associated with the region’s economic and political integration. Put differently, my research takes issue with a narrative that treats tropical deforestation as if it were simply another policy area subject to enforcement and relies on an ahistorical conception of state

---

8 Although territoriality and the legitimate monopoly on violence are defining characteristics of the modern state, my conceptualization extends beyond those characteristics. As explained in Chapter 2 explain, I explore a variety of historical models of state-initiated “social engineering” of forested hinterlands (Scott, 1998, p. 4).
strength that fails to consider the social and territorial determinants of state power (Mann, 1984). In what follows, I propose that we instead conceive state territorial reach (STR) as an antecedent dimension of state strength, one that has traditionally been associated with a particular set of social characteristics.9

Political science literature suggests that policy enforcement is dependent on a minimum of state strength (Brinks, Levitsky, & Murillo, 2019; Holland, 2016). Although such a minimum does not guarantee effective law enforcement, it is difficult to imagine effective enforcement in its absence. An important dimension of state strength in that literature is STR (Eaton, 2012; Giraudy, 2012). Many developing countries with vast hinterlands face the serious challenge of exercising power over great distances (Herbst, 2000). For this reason, states that barely control their peripheries are often characterized as weak (Soifer & Vom Hau, 2008). STR, then, is a first-order concern, and thus an antecedent dimension of strength.

Given the strong link between enforcement and state strength, and between state strength and STR, it stands to reason that high STR will contribute to the achievement of most policy goals, including deforestation prevention. However, as I argue in this dissertation, the enforcement paradigm as currently applied to deforestation rarely considers the role of STR, which is linked to important economic and political integration

---

9 This type of argument is not uncommon in the discipline. The example that comes to mind is the debate over the developmental state. Scholarship initially suggested that the type of state (e.g., predatory vs. developmental) explains industrialization and economic growth (Bates, 1981; Evans, 1995). According to Kohli (2004), however, there exists a “historically prior question” (p. 16) about the origins of different types of states. Studies of the economic consequences of the state must therefore consider the decisive influence of state formation patterns. Kohli claims, for example, that South Korea’s successful developmental state cannot be explained without attention to the particular state-society relations that the Japanese empire left in place.
trajectories. By studying the social sources of STR, my dissertation reveals how the enforcement paradigm fails to recognize the close association between the modern state and the consolidation of internal territorial frontiers, a process in which closing the Amazonian frontier has typically meant the “cleansing” of the forest. STR is much reduced in forestlands due to the absence of basic economic and social conditions that favor the state (Herbst, 2000; Mann, 1984; Scott, 2009). States rarely penetrate a region without a prior transformation of the landscape. Although deforestation occurs where the state is weakest, the clearance of land has historically accompanied the region’s economic and political integration into the market and state project (LeGrand, 1986).

Put differently, although state weakness is a structural constraint that limits the implementation of anti-deforestation policies, it is worth recognizing that the state is weak in forested regions precisely because they are barely integrated. One implication of this claim is that the modern territorial state is typically ill-equipped to prevent further deforestation because STR—a dimension of state strength—is often preceded by forest clearance. This is why contemporary dynamics of Amazon deforestation reveal the Janus face of both the state and the relatively successful peace process in Amazonia.

In sum, the widely accepted link between state strength and better social outcomes may not mechanically apply in the case of tropical deforestation because STR tends to be linked to the very social conditions that favor deforestation. Social phenomena that favor STR and the strength that facilitates it may also favor deforestation. The enforcement paradigm is thus of limited value when it comes to explaining this particular policy area. Analyzing the complex particularities of Amazonia’s territorial integration will better
enable us to explain why the expected virtuous cycle between peace and forest protection has not occurred since the onset of the peace agreement. In establishing the relevance of enduring integration trajectories to questions of state strength, it is useful to consider subnational differences in Amazon deforestation.

1.3. Amazon Deforestation in Colombia

While it is true that Amazon deforestation has markedly increased following the demobilization of the FARC, the effect has not been uniform across the Amazon region. The withdrawal of the FARC has not affected the same transformations everywhere, despite the fact that the guerrilla organization was once active in most Amazonian municipalities. If the FARC’s withdrawal was the main cause of increasing deforestation one would expect similar transformations in all regions previously under their influence.

Arguments that emphasize the causal role of the FARC tend to assume a short-term temporal horizon that compares landscape transformations before and after demobilization (Armenteras, Schneider, & Dávalos, 2018; Baena, 2017; Cote, 2017; López, 2018; Prem, Saavedra, & Vargas, 2019; Wade, 2018). These arguments are implicitly premised on the idea that changes over time are more consequential than changes over space. By contrast, my dissertation emphasizes regional differences when studying the impact of the FARC’s demobilization on deforestation. I argue that the FARC effect is mediated by the long-term economic and political integration trajectories of different Amazonian territories. Put differently, it is necessary to consider historic integration pathways if we are to fully comprehend the FARC’s role in explaining
contemporary deforestation, and doing so requires attention to territorial differences as well as temporal ones.

This invitation to consider enduring integration pathways better accords with existing mainstream literature on tropical and Amazon deforestation, which tends to emphasize economic and demographic explanations over purely political ones (e.g., Andrade, 1992; Armenteras, Rudas, Rodriguez, Sua, & Romero, 2006; Cabrera, Vargas, Galindo, & Ordoñez, 2011). Generally speaking, political variables have not only been understudied but marginalized from academic debates on the drivers of deforestation. Although this specialized literature is useful in identifying the proximate drivers of deforestation, it takes these drivers for granted. For this reason, the basic thrust of my argument is that the immediate drivers of deforestation are themselves configured by other, more primary forces, and that the role of politics becomes clearer when historical processes are considered (Geist & Lambin, 2002).

In order to study the relationship between STR and Amazon deforestation, my research investigates different levels of Amazon deforestation in Colombia at the subnational level and explores the empirical and theoretical relationship between deforestation and the modern territorial state. Colombian Amazonia has been less studied by experts on tropical deforestation than other Amazonian regions. The civil war prevented the study not only of the drivers of deforestation (Rudel, Flesher, Bates, Baptista, & Holmgren, 2000) but also of biodiversity in the Colombian Amazon (Baptiste et al., 2017; Wade, 2018).
1.4. Research Design and Methodological Approach

The methodological decisions in this dissertation were grounded in substantive concerns and guided by two negative considerations. First, I hoped to avoid formulating a research question on the basis of available data or simply in order to accommodate the latest methodologies. Second, I wanted to avoid methodologies that oversimplified complex phenomena. My privileging of substantive concerns over methodological considerations is responsive to a recent invitation for political scientists to produce more grounded studies of Latin American political economy that deal with real-world problems and entail rigorous empirical research (Luna, Murillo, & Schrank, 2014). My approach combines different methods and data sources in order to avoid the mismatch between complex ontologies and over-simplifying methodologies (Hall, 2003). The following subsections provide a general outline of my research design and methodological approach.

1.4.1. The Study of Deforestation and Integration

I employ a mixed-method research strategy, which varies depending on whether I am addressing degrees or types of political-economic integration. I begin by studying the Colombian Amazon as a single case before executing my paired subnational comparison between Caquetá and Putumayo, which are, as I will explain, the two most integrated Amazonian departments exhibiting different levels of cumulative deforestation.

In relation to different degrees of integration, it is worth noting that the Colombian Amazon region does not always overlap with internal political and
administrative boundaries. As such, not every department in the region is completely Amazonian. My research is largely focused on explaining variation in subnational Amazon deforestation in the six departments that are entirely Amazonian: Caquetá, Putumayo, Guaviare, Guainía, Vaupés, and Amazonas (see Figure 1.3). Although the six entirely Amazonian departments belong to the same ecological region and share in common most basic political and economic institutions, they exhibit very different levels of cumulative deforestation. Figure 1.3 schematically illustrates how forest cover is high and cumulative deforestation low—indeed, practically nonexistent—in eastern Amazonia. The figure divides the fully Amazonian departments into two groups corresponding to high (Caquetá, Putumayo, Guaviare) and low (Guainía, Amazonas, Vaupés) levels of cumulative deforestation. This initial difference is the baseline to the study the contribution of different degrees of integration.

However, as mentioned previously, an important goal of my dissertation is to propose an empirically-grounded theory to explain differential levels of cumulative deforestation among regions with active deforesting frontiers. The methodological challenge is to systematically compare at least two cases with similar degrees of integration but different levels of cumulative deforestation. Caquetá, Putumayo, and Guaviare are all part of the Colombian “arc of deforestation,” the region in which the

---

10 Amazonia is an ecological region comprising the basins of the Amazon and Orinoco rivers. Here, I use the official delimitation of Amazonia, obtained from the Colombian SINCHI Institute, and based on the ecological rather than the political characteristics of the region.

11 I thus exclude from the analysis the partially Amazonian departments Cauca, Meta, Nariño, and Vichada because their developmental trajectories are mostly shaped by factors beyond the Amazon region.
agricultural frontier has expanded the most (Armenteras et al., 2006). Among the three Amazonian departments in the “arc of deforestation,” Caquetá is clearly the department with the highest cumulative deforestation: it represents half of all cumulative Amazon deforestation in Colombia. Putumayo and Guaviare exhibit lower levels of deforestation compared to Caquetá. 

Figure 1.3. Integration and cumulative deforestation in the Colombian Amazon

Data for primary and secondary roads from IGAC-SIGOT, for land cover from INDEAM-SIAC, for international boundaries from Natural Earth, for the Colombian Amazon region from SINCHI-SIATAC (coauthored with Nicolás Herrera).

---

12 Compared to the departments of Eastern Amazonia, departments located in the “arc of deforestation” are characterized by higher economic development and more elaborate population and infrastructure networks. This division confirms the strong conclusions of the specialized literature on tropical deforestation.

13 Furthermore, as it was explained, both Putumayo and Guaviare are part of the “arc of deforestation” and have higher levels of deforestation compared to Amazonas, Vaupes, and Guainia.
In what follows, I present my case selection rationale and other inference strategies. First, on the question of case selection, Caquetá and Putumayo are the best Colombian provinces in which to explore my research question because they exhibit similar values on most variables that existing scholarship has identified as the drivers of deforestation. Historically, Caquetá and Putumayo are the most similar cases in the Colombian Amazon, a fact that allows me to identify divergent types of integration above and beyond their baseline similarities. In short, they are similar cases with starkly different outcomes (Tarrow, 2010).

Neither Caquetá nor Putumayo have been crucial centers of government or development in Colombia (Meisel, Bonilla, & Sánchez, 2013; Serje, 2011). They are part of the historic peripheries of the Colombian state whose circumstances can be traced back to pre-colonial times, when a centralized political order and economy were inchoate. The peripheral character of these regions persisted through the colonial period and into the post-colonial era. Only in the mid-twentieth century did their development paths diverge. Furthermore, Caquetá and Putumayo are part of the same ecological region and share most basic ecological and geographical characteristics. ¹⁴ Both territories are located partly in the eastern Andes, partly in the foothills of the Andean mountain range, and partly in the vast plains of the Amazon region (see Figure 1.2). Their shape follows the basic contours of most Andean-Amazonian rivers, which originate in the highlands and flow towards the great Amazon river in Brazil. In sum, Caquetá and Putumayo are similar

¹⁴ Geographic and ecological variables are important because rainfall patterns, soil quality, lighting, and temperature influence commercial agriculture and, therefore, deforestation.
in terms of their pre-twentieth-century development trajectories and their ecological, geological, and geographic characteristics.

These similarities are best appreciated when Caquetá and Putumayo are compared with the other Amazonian regions that also exhibit relatively high degrees of integration: Guaviare and Southern Meta (see Figure 1.2). Although Guaviare is also an active agricultural frontier with a relatively high degree of integration, compared to Caquetá and Putumayo it has distinct ecological and long-term developmental characteristics. Guaviare is an Amazonian department, but not part of the Amazonian foothills (it is far from the Andes and its terrain is uniformly flat); it does not belong to the Amazon river basin;\(^\text{15}\) and most importantly, it has only recently experienced agrarian colonization (Arcila, González, & Salazar, 1999). Southern Meta, meanwhile, is part of a department that is not primarily Amazonian. Thus, given my research interests, Caquetá and Putumayo are the most similar subnational cases in Colombia.

However, the similarities between the two departments raise the question of possible interdependencies with the “potential for diffusion and borrowing among subnational units” (Snyder, 2001, p. 97). Indeed, it is difficult to find completely independent cases in a single country, particularly when subnational cases are geographically contiguous. However, I suggest that interdependence between Caquetá and Putumayo is not as much of a problem as one might at first suspect. The Caquetá River area, the natural border between the two departments, was barely colonized until

\(^{15}\) The Amazon region in Colombia is formed by the Amazon and Orinoco River basins. Most of Guaviare is part of the Orinoco basin, meaning that savannas are an important part of the department’s ecology.
the mid-twentieth century (Brucher, 1974), and the two departments are not directly connected by roads today. Until the early 1990s, one had to travel through three departments—Nariño, Cauca, and Huila—in order to move between Putumayo and Caquetá by road.

As far as methods of inference are concerned, by systematically comparing the integration trajectories of Caquetá and Putumayo, I am able to ascertain why departments with similar degrees of integration nonetheless display different levels of cumulative deforestation. The comparison benefits from the strengths of five general approaches: paired comparisons, contextualized comparisons, subnational comparative method, comparative historical analysis, and inductive process tracing.

I employ the logic of paired comparisons (Tarrow, 2010) and in particular Mill’s method of difference—the most-similar-system design—to contrast divergent integration paths in the Amazonian foothills. This comparison is not only paired but also contextualized insofar as it carefully considers the “social ecology of diverse spatio-temporal contexts” (Sil, 2013). Given that I compare two cases within a single country, the comparison also benefits from the advantages of the subnational comparative method (Snyder, 2001). Deforestation is concentrated in particular regions and national averages

---

16 The Colombian government has not built a bridge over the Caquetá River. In the 1960s, Andean countries committed to building La Marginal de la Selva, a regional road that was never finished in Colombia. The lack of a bridge over the Caquetá River, which divides Caquetá from Putumayo, is one of the aborted project’s most noteworthy consequences. However, it is worth noting that the Caquetá river has historically allowed economic exchanges between the two provinces.

17 The connection improved during the 1990s when a road between Putumayo and Huila was finally built. Thanks to the road’s completion, it became possible to move between the Amazonian foothills through Huila. There is still no a direct route between Caquetá and Putumayo. However, travelers and merchants can use rivers to move in the region.
mask the most important sources of variation. Due mostly to data limitations, my main unit of analysis is the department. While historical data on deforestation can be separated from the state’s administrative boundaries, data on social, economic, and political phenomena cannot. The problem of data availability beyond administrative divisions tends to be acute when studying slow-moving historical transformations (Soifer, 2019).

This paired, contextualized, subnational comparison traces divergent paths over time. I thus exploit both spatial and temporal variation. Comparative Historical Analysis, an approach that is “oriented toward the explanation of substantively important outcomes” (Mahoney & Rueschemeyer, 2003), provides a set of analytical tools for lay out the temporal changes of theoretical relevance. Furthermore, I have implemented inductive process tracing (Falleti & Mahoney, 2015) because sound, contextualized induction, rather than universal deductive reasoning, is the most promising technique for generating new hypotheses about the world. Both comparative historical analysis and inductive process tracing facilitate the identification of the underlying drivers of deforestation, a substantively important outcome that is rarely studied in political science.

1.4.2. Data

In May 2015, following my proposal defense, I began a course of research that included extensive fieldwork in the Colombian Amazon, examining archival materials on regional development, conducting in-depth interviews, and producing an original
geodatabase on cumulative deforestation.\textsuperscript{18} I decided to focus on the Amazonian foothills because the literature had already identified that region as a site of deforestation, both historically and presently.

During the course of my research, I developed a comprehensive understanding of Amazon deforestation that foregrounds the role of history (Pierson, 2004) and integrates the study of local dynamics and perceptions (a view from below) with large-scale transformations (a view from above). Although my empirical chapters and appendices will provide concrete information about my sources, it is worth mentioning here that the “view from below” is based on materials from three historical archives on regional development,\textsuperscript{19} 90 in-depth interviews with local authorities and leaders,\textsuperscript{20} and a systematic analysis of the relevant secondary sources. The “view from above,” meanwhile, relies on the technical processing of at least 50 Landsat satellite images (see Appendix A).

Although the use of satellite imagery in political science is still uncommon, the number of research projects using remote sensing techniques has increased markedly in recent years.\textsuperscript{21} As a qualitative researcher, I was at first tempted to discount the use of satellite images. However, because land-use changes are typically measured with satellite images and remote sensing techniques (Busch & Ferretti-Gallon, 2017), I decided to

\textsuperscript{18} I defended my dissertation project before the FARC demobilized, at a time when the environmental impact of the guerrillas’ withdrawal was unknown.  
\textsuperscript{19} I reviewed the historical archives of the Corpoamazonia, of Caquetá governor’s office, and of the National Department of Intendancies and Commissariats (DAINCO).  
\textsuperscript{20} All interviews were conducted during trips to Putumayo, Caquetá, Bogotá, Pasto, and Neiva between June 2015 and May 2018. Most fieldwork was conducted between mid-2015 and early 2017.  
invest the additional time and resources to understand them. I have consequently come to believe that interdisciplinary collaboration is easier when researchers proactively utilize contributions from multiple disciplines. The disciplinary division between the social and natural sciences when it comes to studying the environment has a methodological dimension, in which mutual mistrust of unfamiliar methodologies limits our ability to properly understand complex environmental phenomena like tropical deforestation.

By taking advantage of the strengths of remote sensing techniques, my dissertation attempts to mitigate some of the negative effects of sharp disciplinary boundaries. While I build on remote sensing, I also recognize its limitations. This moderate optimism explains my decision to combine views from above and below. While satellite images can represent large-scale transformations, they cannot make sense of social and political dynamics on the ground. Similarly, qualitative strategies of data collection can shed light on the social complexities of Amazon deforestation, but they are poorly suited to measure large-scale landscape transformations. In addition, satellite images are neither produced by the Colombian government nor mediated by local perceptions, which are important concerns for most data collection efforts (Herrera & Kapur, 2007).22

To be sure, there is an emerging industry dedicated to measuring land-use changes and deforestation with satellite technology.23 These data improvements facilitate state-

---

22 See Herrera & Kapur (2007) for an interesting analysis of the way politics affect both data collection and substantive conclusions.
23 See, for example, Global Forest Watch’s impressive effort to measure annual deforestation globally since 2001: https://www.globalforestwatch.org/. In Colombia, it is important to recognize the contributions of the IDEAM, which produces a deforestation report every three months since 2013.
building in the Amazon because standard measurements are basic tools for controlling territories and populations. Official representations like “maps, censuses, cadastral lists, and standard units of measurement” constitute “techniques for grasping a large and complex reality” (Scott, 1998, p. 77). Unfortunately, such efforts tend to assume very limited time horizons and rarely take history into account. Available data on tropical deforestation are typically produced by state authorities attempting to prevent deforestation, or by environmental activists interested in measuring progress (or the lack thereof). Unsurprisingly, these policy-oriented data-collection efforts are geared towards “monitoring” and the issuing of “alerts.” Because academic research on deforestation is largely dependent on this data, most existing literature on the drivers of Amazon deforestation focuses on transformations occurring in the twenty-first century.

Given that a central contribution of this dissertation is to emphasize the importance of history, and because available data is rarely historical, I decided to produce a unique historical geodatabase on forest cover for my study area (see Figure 1.4). I have processed and technically classified five sets of ten Landsat images (one set per decade) beginning in the mid-1970s.²⁴

²⁴ See Appendix A for technical details. To build this geodatabase, I first completed three specialized courses on Geographical Information Systems (GIS), Digital Cartography, and Remote Sensing at the Colombian Geographical Institute (IGAC). I subsequently benefited from the superb research assistance of Nicolás Herrera and the constant advice of Osman Roa, an expert at the IGAC.
Figure 1.4. Processed Landsat images

Data for the Amazon region from SINCHI, for altitude from INDEAM, for Landsat Images from the U.S. Geological Survey (coauthored with Nicolás Herrera).

This database allows me to measure cumulative Amazonian deforestation over time since the mid-1970s. Historical and unprocessed satellite images are accessible on the internet through the U.S. Geological Survey. With images dating back to 1972, Landsat is the world’s oldest continuous data collection project to utilize remote sensing techniques. By taking advantage of this freely-accessible raw historical data, my dissertation presents original information on cumulative deforestation in the Amazonian
foothills of Colombia. To the best of my knowledge, my dissertation is the first effort to measure cumulative deforestation in the area of study over such an extended period of time.

1.5. Why Study Amazon Deforestation and Why in Political Science?

1.5.1. A Key Component of the Contemporary Ecological Challenge

Deforestation, defined as the permanent clearance of forestland, is not a novel phenomenon. Human beings have repurposed land and expanded agricultural frontiers for centuries (Cronon, 1995; Michael Williams, 2003). Clearing the forest is a common, historically accepted, and positively valued practice. As Lanly (2003) observes, “history has shown that human beings have most often considered the forest as a space that must be cleared in order to develop activities other than forestry (particularly farming).” The practice intensified with the sustained development of commercial agriculture throughout the world. In this sense, the real novelty is our contemporary awareness of the negative environmental consequences of traditional economic activities (e.g., Agrawal, 2005). Only in the twentieth century were the negative consequences of deforestation identified, in accordance with the changing “spirit of the times.”

An important justification for my research project is the emerging concern with the environmental problems resulting from Amazon deforestation. To be sure, the primary objective of this dissertation is not to assess the environmental consequences of Amazon deforestation but to identify its underlying socio-political determinants.
However, in order to understand the significance of Amazon deforestation, it is necessary to briefly review the important ecological role that tropical rainforests play in the global environment. On the basis of mounting scientific evidence, I begin from the assumption of a global ecological problem, in which the Amazon region plays a crucial role as both a problem and possible solution. I thus accept that the ecological problem exists, that action must be taken to remediate it, and that politics is an indispensable arena for the development and implementation of meaningful solutions. Needless to say, my research project is likely to hold little interest for those who deny the existence of a global ecological problem that needs to be addressed.

Climate change deniers aside, the scientific community tends to agree on the existence of an anthropogenic environmental problem. Atmospheric chemist Paul Crutzen (2002), winner of the 1995 Nobel Prize, has proposed that human-made environmental transformations have become so important that a new geological epoch has emerged: the Anthropocene. For better or worse, and despite many criticisms, the idea has garnered substantial scientific and political attention and currently frames environmental debates. In any event, we need not agree with the concept of a new

---

25 Some environmental activists and scholars conceive forest conservation as an end in itself. The idea of the “rights of nature” is an interesting example. See Nash (1989)’s classic philosophical discussion of the foundations and implications of recognizing the rights of nature.

26 Climate change denial began in the U.S. following the Kyoto Protocol and subsequently diffused to countries like the United Kingdom, Australia, and Canada. Companies, think tanks, self-proclaimed experts, conservative media, and conservative political leaders are the driving forces behind climate change denial (see Dunlap & McCright, 2011), a position that in the U.S. tends to be espoused by conservative white males (see McCright & Dunlap, 2011). See Dunlap and McCright (2011), Jacques (2012), and Norgaard (2011) for an explanation of the emergence and strengthening of climate change denial.

27 See Lövbrand et al. (2015) for a critique of the widespread use of the Anthropocene for failing to consider the social and economic characteristics of the problem. Some have attempted to re-signify the term to mean something more than just the anthropogenic modification of the environment, which they argue is not a novel phenomenon.
geological epoch to recognize the existence of a human-induced environmental problem of global scale.

The international community tends to conceive climate change as the most important environmental issue. The causes of climate change are diverse, with a range of national and transnational actors and activities contributing to the problem. Both developing and developed countries play a crucial role and share responsibility for remediating its effects (Humphreys, 2013; Marc Williams, 2005). However, we cannot ignore the existence of an international political economy of climate change in which those who benefit from development tend to be different from those who suffer the environmental consequences (Clapp & Dauvergne, 2011). Despite this distributive conflict, there is an emerging consensus on the idea that climate change is a global problem requiring global solutions. The main contribution that developing countries like Colombia have made to climate change is not so much air or water pollution as the unsustainable depletion of natural resources. Developing countries face a serious dilemma because they tend to be integrated into the global economy through the exploitation of natural resources, which are assumed to comprise their comparative advantage (Svampa, 2015). Contemporary deforestation mostly happens in tropical countries that, unlike developed nations, still have large forests to clear or protect.

Although the drivers of environmental degradation are diverse, my research focuses on only one environmental phenomenon that contributes to climate change:
deforestation.28 By taking this focus, I do not deny the significance of other environmental issues. I simply believe that academic research on the environment is more promising when the idea of the environment is unpacked. The general view of a global environmental problem obscures the fact that particular economic activities engender particular environmental consequences that in turn give rise to distributive conflicts of a particular kind. Unpacking the global environment allows us to better understand the political economy of climate change, to more carefully assess the relative contributions of particular environmental problems, and to more clearly envision effective political solutions.

Most academic literature on Amazon deforestation is the work of natural and environmental scientists and highlights the negative consequences of Amazon deforestation on a global, regional, and local scale. At the global level, it is argued that Amazon deforestation is an important driver of climate change. Deforestation not only releases carbon into the atmosphere,29 it also reduces the capacity of the rainforest to act as a carbon sink. One need not exaggerate the environmental role of the Amazon nor reinforce the myth of the pristine rainforest, as many environmental activists strategically do, in order to recognize the global significance of the region (Gash & Nobre, 1997; Shukla, Nobre, & Sellers, 1990). Amazonia is the biggest tropical rainforest and the largest agricultural frontier in the world. Despite the region’s economically and

28 If annual carbon emissions resulting from deforestation were tallied and treated as a country, that country would be the third largest contributor to climate change after China and the U.S. (Gibbs, Harris, & Seymour, 2018).
29 Deforestation releases greenhouse emissions that speed up global warming, an effect that is even more problematic when burning is the most common technique used to transform the landscape.
politically peripheral character, the literature on climate change has repeatedly determined that preventing Amazon deforestation is essential to slowing climate change (Food and Agriculture Organization of the United Nations, 2011). Unsurprisingly, “Amazonia” is the word that appears most frequently in recent studies of the drivers of deforestation (Aleixandre-Benavent, Aleixandre-Tudó, Castelló-Cogollos, & Aleixandre, 2018). As one scholar notes, the Amazon region contains “one-fifth of the planet’s available fresh water, one-third of its evergreen broad-leaved forest resources, and one-tenth of its living species” (Garfield, 2013).

In addition to its global impact, Amazon deforestation also has environmental consequences at the regional level. Because forests perform critical natural functions, deforestation affects soil quality, water nutrients, and rain patterns. It has been argued, for example, that Amazon deforestation carries the potential to disrupt rainfall patterns and impact climate cycles beyond South America, including in the United States. Finally, at the local level, Amazon deforestation tends to reduce precipitation and biodiversity, to lengthen dry seasons and droughts, and to erode the soil (Lean & Warrilow, 1989; Shukla et al., 1990).

In sum, growing interest in remediating the environmental impacts of deforestation has stimulated scientific inquiry into its drivers. The ecological importance of the Amazon is the primary justification for research in this field. Mounting evidence

---

30 For example, scientists found that Amazon deforestation would directly affect the U.S. because it results in “10%-20% precipitation reductions for the coastal northwest United States and the Sierra Nevada” (Medvigy, Walko, Otte, & Avissar, 2013, p. 9115).
suggests that the negative consequences of Amazon deforestation have already become visible, and that global climate change is one of them.

1.5.2. The Study of Amazon Deforestation in Political Science: Justification and Contributions

Deforestation has gone largely unremarked in political science. To the best of my knowledge, my dissertation represents one of the only book-length contributions by a political scientist to address the political economy of Amazon deforestation. In addition, Table 1.1 depicts the number of articles on deforestation published in political science journals between 1945 and 2018—94 peer-reviewed articles in total. This number is small given that 1) political science journals also publish work from other disciplines (overestimated values); 2) the number of publications on core topics like democracy and institutions is significantly higher,\(^{31}\) and 3) most existing political science articles on deforestation did not appear in top journals (see Table 1.1).

Table 1.1 thus shows that political science has rarely made contributions in this area, although two important articles are currently under review (Alcañiz & Gutiérrez, 2018; Slough & Urpelainen, 2019), and one was published in June 2019 (Fernández & Garay, 2019), all focusing on the efficacy of contemporary anti-deforestation policies. While my research deals with an uncommon object of inquiry in political science, one should not thereby conclude that the discipline has nothing to offer the study of

\(^{31}\) For example, the same database returns 18,251 results for the root “democra*” and 23,607 for the root “institutio*.”
deforestation. On the contrary, my project draws many theoretical and methodological insights from political science.\textsuperscript{32} In the remainder of this section, I lay out five justifications for the study of Amazon deforestation in political science.

Table 1.1.

*Deforestation Articles in Political Science and International Relations*

<table>
<thead>
<tr>
<th>Journal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Environmental Agreements - Politics Law and Economics</td>
<td>12</td>
</tr>
<tr>
<td>Global Environmental Politics</td>
<td>11</td>
</tr>
<tr>
<td>Environmental Politics</td>
<td>5</td>
</tr>
<tr>
<td>International Area Studies Review</td>
<td>4</td>
</tr>
<tr>
<td>Journal of Peace Research</td>
<td>4</td>
</tr>
<tr>
<td>Marine Policy</td>
<td>4</td>
</tr>
<tr>
<td>Social Science Quarterly</td>
<td>4</td>
</tr>
<tr>
<td>Journal of Commonwealth &amp; Comparative Politics</td>
<td>3</td>
</tr>
<tr>
<td>Political Geography</td>
<td>3</td>
</tr>
<tr>
<td>World Economy</td>
<td>3</td>
</tr>
<tr>
<td>Annals of the American Academy of Political and Social Science</td>
<td>2</td>
</tr>
<tr>
<td>Global Policy</td>
<td>2</td>
</tr>
<tr>
<td>International Studies Quarterly</td>
<td>2</td>
</tr>
<tr>
<td>Pacific Review</td>
<td>2</td>
</tr>
<tr>
<td>Review of Policy Research</td>
<td>2</td>
</tr>
<tr>
<td>Studies in Comparative International Development</td>
<td>2</td>
</tr>
<tr>
<td>Additional journals with one article</td>
<td>29</td>
</tr>
</tbody>
</table>

\textit{Note.} Articles on deforestation published in political science journals and included in the *Web of Science* (2018).

First, politics is an essential arena in which both problems and solutions to those problems play out, and environmental concerns like Amazon deforestation are no exception. Although the study of tropical deforestation has been mainly advanced by the

\footnote{\textsuperscript{32} Politics is the primary object of study in political science, which focuses on, \textit{inter alia}, political institutions and behavior.}
natural and the environmental sciences, most practitioners and scholars tend to accept that solutions are political. While environmentalists highlight both the existence of ecological problems and the importance of remediating them, social scientists face the challenge, in my opinion, the moral duty of understanding their mechanics. Although problems like Amazon deforestation are problems of nature, they are produced by a complex combination of social, economic, and political factors. Despite the fact that social scientists are better equipped to understand those factors, the causes and consequences of environmental degradation have not received much social scientific attention.\footnote{There are notable exceptions in each discipline, but they are usually confined to the margins of their respective disciplines. Fortunately, the emerging field of Environmental Humanities has recently begun promoting dialogue between scholars in the humanities and the social sciences whose work deals with environmental issues.} The one discipline solely devoted to the study of politics—political science—has rarely examined the interests, incentives, and institutions associated with Amazon deforestation and conservation.\footnote{There are naturally some exceptions to this general claim. See Chapter 2 for details.} Without relatively clear theories about the political economy of deforestation, it is difficult to explain why certain environmental protection strategies fail or succeed.

My dissertation illustrates the type of contribution that political science can make if interdisciplinary scholarship is promoted. Rather than ignoring or challenging the natural and environmental sciences, I offer an interdisciplinary project that builds on their contributions and at times utilizes their methodologies (see Appendix A). This orientation is important because the study of the role of the state in Amazon deforestation has become trapped amidst a disciplinary divide. Those who study the state—i.e., political
scientists have paid little attention to the environment, and those who study the environment i.e., natural scientists tend to understudy or oversimplify the role of politics and the state. Contemporary debates over the role of the state in deforestation are replete with reductionism, generalizations, and over-simplifications. For this reason, an important goal of my dissertation is to reveal the complexity of the state-environment relationship by building on political science contributions.

Second, the study of environmental problems like Amazon deforestation could help the discipline avoid increasing public irrelevance. As political scientists fiercely compete to fill smaller and smaller niches within the classical subfields through exercises in deductive reasoning and increasing methodological sophistication, many substantive, real-world problems remain largely understudied and undertheorized (e.g., Luna, Murillo, & Schrank, 2014). An excessive emphasis on theory testing ends up obscuring the importance of studying the real world and generating novel theories about it (T. G. Falleti, 2016). Therefore, my dissertation’s objective is to provide an empirically-grounded theory of Amazon deforestation that demonstrates the relevance of political science to issues of pressing public concern. I believe this theory sheds needed light on the political economy of Amazon deforestation.

Third, by studying the complex relationship between deforestation and STR, I am sensitive to the “spirit of the times” that calls on us to strengthen the state, facilitate economic development, and promote environmental protection. While it is true that developed and developing countries alike have a shared responsibility to address climate change, developing countries face unique challenges. In these countries not only is the
exploitation of natural resources an important part of the economy, but state weakness is common. STR is a concern in most developing countries, and Colombia – the only South American country still afflicted by a civil war – is no exception. However, normative expectations about the best way to strengthen states have steadily changed. Proponents of state formation face the major challenge of figuring out how to project power over great distances while simultaneously preventing the further depletion of natural resources. My dissertation can help both theorists and practitioners understand one of the most important contemporary dilemmas affecting state-building efforts in a historically peripheral region that is quickly becoming central to the global economy and environment (Clapp & Dauvergne, 2011).

Fourth, the study of Amazon deforestation can facilitate a recognition that spaces and territories are alive and that most political processes take place amidst concrete ecosystems. Not all political science research is attentive to the important role of territory, and those studies that are rarely take into consideration the ecological characteristics of a particular region. For example, Miguel Centeno (2002)’s Blood and Debt offers a theory of state formation in South America that highlights as most state formation theories do the enormous challenge of governing the hinterland. Nevertheless, Centeno’s seminal work neither recognize that the Amazon region is the largest hinterland in South America nor that this region spans more than 40% of South America. In fact, Centeno’s book mentions the Amazon only five times. He barely acknowledges that the Amazon is a resource-rich and biodiverse tropical rainforest shared by most countries in South America (Hecht & Cockburn, 2010). Unlike other
hinterlands (e.g., a desert), the Amazon region can be quickly transformed through the introduction and promotion of technology, capital, and labor. My dissertation recognizes that territories possess different ecological characteristics that condition their prospects for economic and political development.

Finally, the study of Amazon deforestation helps problematize the way mainstream political science has traditionally understood geographical variables. Scholars in the discipline tend to treat geography as an independent variable with important causal weight when it comes to explaining outcomes like development, poverty, and violence. The idea of a “rough terrain” conducive to violent conflict or a geography that stymies development are clear examples of it (e.g., Fearon & Laitin, 2003; Sachs, 2003). Far from disappearing, geographical determinism has simply assumed a more sophisticated form. It has become commonplace to offer theoretical models that incorporate geographical variables as part of a strategy to distinguish causation from correlation. Geography is conceived as an “external” control variable enabling researchers to isolate the causal effect of some independent variable of interest. Treating geographic variables as exogenous sources of variation is a common strategy among designers of natural experiments (e.g., Dunning, 2012). Contemporary political science thus conceives geography as if it were a first cause akin to Aristotle’s unmoved mover.

Few scholars in the discipline have pursued the opposite strategy, that is, studying the way in which politics can influence geography. My dissertation exemplifies this second approach based on the idea that the unmoved mover is also socially constructed
and that it can sometimes be endogenous to the discipline’s most important variables of interest. “Territory doesn’t just happen: it has to be worked” (Painter, 2010, p. 1105).

Rough terrain does not have to be rough: it can be perceived differently, or radically softened. Thus, by studying the political economy of Amazon deforestation, my research project illustrates the necessity of avoiding the geographical determinism characteristic of much recent political science.

I believe that an ever-increasing interest in environmental issues will compel political scientists to better understand exactly how geography matters, beyond the simplistic contemporary approaches described above. If geographical variables were truly exogenous or constant, we would not be grappling with environmental problems in the first place. Forests are lost, rivers dissipate, sea levels rise, and topographies change. My dissertation, therefore, emphasizes that territories are alive and that peripheries are ecologically diverse. By studying human-nature transformations in the Amazon region and considering the ecosystems at play, I expect to raise awareness in the discipline about the changing nature of geography and the importance of avoiding simple determinisms.

In sum, Amazon deforestation is a real-world environmental problem that has gone largely unexplored in political science. My dissertation makes an important contribution to the discipline by encouraging researchers to 1) comprehend the role of politics in promoting or preventing environmental degradation; 2) escape the current tendency towards social irrelevance; 3) understand the pressing dilemmas of contemporary state building; 4) recognize that territories are living organisms; and 5) move beyond the limits of contemporary geographical determinism.
1.6. Argument in Brief

The principal objective of this dissertation is to generate an empirically-grounded and politically-oriented explanation for Amazon deforestation. Here, I offer a summary of the basic argument with the aim of unpacking the complex relationship between STR and deforestation. Thus, it is a two-step argument.

1.6.1. Cumulative Deforestation Results from Degree of Integration

I propose that cumulative Amazon deforestation results from different degrees of integration of entirely Amazonian departments into the market and the Colombian state project. Amazonia can be characterized as a “brown zone,” defined by Guillermo O’Donnell (1993, p. 1359) as a region in which the state has little territorial or functional presence. This general characterization is based on an implicit comparison between the Amazon and the most integrated parts of the country, where both wealth and power are concentrated.

However, important differences persist among Amazonian provinces, which exhibit not only different levels of cumulative deforestation but also different degrees of territorial integration. Forested areas in the Colombian Amazon, for instance, tend to be less integrated than non-forested areas, which have undergone a process of massive deforestation. High territorial integration thus spatially coincides with high cumulative deforestation, and the opposite is also true. When the ecological characteristics and internal differences of the Amazon in Colombia are considered, we observe that forested areas where cumulative deforestation has been low are “browner.” This spatial
relationship raises questions about the ecology of the modern territorial state. In light of this association and its drivers, my dissertation proposes that high cumulative deforestation results from different degrees of integration.

Why are forested areas “brown zones”? Why are these areas less integrated? Why is STR lower in forested areas? How can we make sense of this association? My dissertation argues that the negative relationship between STR and forest cover is neither random nor causal: the state is not the cause of deforestation, nor does deforestation produce subnational variation in stateness. How, then, is the relationship best characterized? I propose that deforestation and STR are closely related because they are both driven by the same phenomenon: agrarian colonization. Inward migration, massive landscape transformation, infrastructure development, and STR have all gone hand in hand. Therefore, deforestation and STR should be conceived as part of an endogenous process: the advance of agrarian colonization promotes deforestation in the short term, and in so doing expands STR in the long term.

But the modern state is a complex political organization with different forms of territorial reach that do not necessarily exhibit the same negative relationship with forested areas. To capture this reality, my dissertation offers a conceptual map that unpacks the varieties of STR. I suggest that states penetrate their peripheries in accordance with the goals of different sectoral agendas and argue that state land-use planning institutions like national parks and indigenous reservations coincide with densely forested areas. In those forms, territorial integration is possible beyond and apart
from agrarian colonization and deforestation. That is, certain varieties of STR can be detached from the social conditions that favor both state strength and deforestation.

How does recognizing the varieties of STR affect the idea of a negative association between forested areas and integration? I still suggest that the relationship persists—that forested areas are “brown”—for the reason that these detached forms of territorial reach tend to be merely formal, delegated, and/or concentrated on a single function. On the basis of this conceptualization, I argue that forested areas can be considered brown zones when direct rule and comprehensive forms of STR (that is, STR as traditionally conceived) are taken into account.

1.6.2. Cumulative Deforestation Results from Type of Integration

The second part of my argument goes a step further to explore the causes of the different levels of cumulative deforestation experienced by Caquetá and Putumayo, the two most integrated Amazonian departments of Colombia that still have different levels of cumulative deforestation. Although these two provinces were very similar until the mid-twentieth century in terms of their ecological endowments, developmental legacies, and demographic trends, cumulative deforestation is much higher in Caquetá than in Putumayo. My dissertation presents the basic results of a paired contextualized subnational comparison between these two Amazonian provinces.

By comparing Caquetá and Putumayo, I determine that differential levels of cumulative deforestation are explained not only by different degrees of integration, as it was mentioned, but also by different types of integration. Put differently, when the degree
of integration is held constant, different types of integration help explain variation in cumulative deforestation. Largely similar until the mid-1950s, Caquetá and Putumayo began to diverge in both their integration trajectories and their corresponding levels of deforestation as a result of the different strategies adopted by the Colombian state between 1958 and 1978—that is, during the so-called developmental era.

More specifically, I suggest that cumulative deforestation in Caquetá is high due to a particular trajectory of integration in which commercial farming was consolidated and democratized as a consequence of state-led policies. By contrast, low cumulative deforestation in Putumayo results from a markedly different state-led strategy of economic and political integration. There is comparatively low cumulative deforestation in Putumayo because the central government decided to promote extractive rather than agricultural development during the 1960s and 1970s. Therefore, state-made markets are responsible for different levels of deforestation because they introduced concrete material interests: while integration through commercial farming made dispersed and extensive settlements profitable, integration through large-scale extraction benefited nucleated settlements. By the end of the seventies, when coca crops reached the Amazonian foothills, Caquetá and Putumayo were on two very different integration paths. While coca cultivation reinforced the legal farming economy in Caquetá, it quickly became the only rural product in Putumayo.

The third and final part of my argument represents a preliminary attempt to understand the enduring legacies of these varied integration trajectories for environmental action. I argue that the strength of environmental coalitions at the local level varies by
historical integration trajectory. In other words, studying the enduring trajectories of economic and political integration is essential if we are to understand not only cumulative deforestation—the main outcome of interest in this dissertation—but also the concrete possibilities of anti-deforestation policies at the local level.

I propose that different integration trajectories have bequeathed longstanding cultural, and political legacies that could not be limited to purely economic factors. Culturally, both trajectories promote a set of transcendent values not limited to utilitarian economics. Although both provinces were born out of colonization, only in Caquetá are prestige, pride, and social recognition strongly associated with cattle ranching. Politically, different integration trajectories have shaped the dominant political economy in each region, in turn constraining individual behavior. Regions where integration occurred through commercial farming, I suggest, are not only reluctant to embrace anti-deforestation policies, but also tend to oppose contemporary efforts to introduce large-scale extractive industries. By contrast, where integration occurred through extraction, local populations are less unified and radicalized in opposing both anti-deforestation policies and large-scale extractive industries. I argue that different dominant political economies are dependent on the particular way in which costs and benefits are distributed. In farming provinces, people benefit from commercial agriculture and the environmental externalities of these economic activities are perceived as abstract. By contrast, in large-scale extractive provinces, economic benefits are less widely distributed and environmental problems—mostly those associated with water pollution—are seen as “concrete” because they affect the farming economy.
1.7. A Roadmap

In addition to the present introduction, this dissertation contains six chapters and three methodological appendices. Chapter 2 lays out the complex relationship between STR and Amazon deforestation. Combining existing knowledge of Amazon deforestation and STR, it presents the basic concepts we will need to properly theorize the role of the modern territorial state in an ecologically-strategic region like Amazonia. Colombia has multiple brown zones, but some of them are easier to transform than others. Chapter 3 provides an empirically-grounded theory linking variation in cumulative deforestation with different degrees and types of territorial integration. The main objective of this chapter is to establish the reasons that forested areas tend to be brown zones in Colombia and, arguably, in the other Amazonian countries. It also develops the argument that we should consider both degree and type of integration when studying Amazon deforestation.

Moving the empirical analysis forward, Chapters 4, 5, and 6 focus on the relationship between cumulative deforestation and diverse types of integration. These three chapters present the results of my contextualized paired comparison between Caquetá and Putumayo. They define and characterize the evolution of the different integration trajectories undergone by Caquetá and Putumayo and establish their relationship to Amazon deforestation. These chapters are chronologically organized in order to facilitate the comparison between the two provinces. Chapter 4 focuses on integration trajectories before the mid-twentieth century to understand the similarities between Caquetá and Putumayo and lay out the critical antecedents that facilitated
divergence. Chapter 5 studies state policies and private investments that were implemented in these two provinces during the developmental era, which is conceived as a critical juncture at which the basic features of each enduring integration trajectory were defined. Chapter 6 describes the enduring legacies of these trajectories, which I suggest constrain contemporary political efforts to protect the forest in the Amazon region. Finally, Chapter 7 offers a conclusion that reflects on the contributions and limitations of the argument and explores some of its practical implications.
CHAPTER 2. DEFORESTATION, STATE UNEVENNESS, AND THE ECOLOGY OF BROWN ZONES

“Let us imagine a map of each country in which the areas covered by blue would designate those where there is a high degree of state presence (in terms of a set of reasonably effective bureaucracies and of the effectiveness of properly sanctioned legality), both functionally and territorially; the green color indicates a high degree of territorial penetration and a significantly lower presence in functional/class terms; and the brown color a very low or nil level in both dimensions.”

“The state is the mountain that all political scientists sooner or later must climb.”
Joel Migdal (2001, p. 231)

2.1. Introduction

The previous chapter outlined my dissertation’s primary objectives, the most important of which is to generate an empirically-grounded theory to explain the relationship between state strength and Amazon deforestation in Colombia. To that end, the present chapter lays out the dissertation’s conceptual foundations as a necessary prelude to constructing its overarching theoretical argument (Chapter 3) and interpreting its empirical basis (Chapters 4, 5, and 6). In this chapter, I conduct an interdisciplinary dialogue between political science and the environmental sciences. The study of Amazon deforestation and the complex role of the modern territorial state therein has become trapped between the overly simplistic view of politics advanced by the environmental sciences and the general disinterest in environmental issues exhibited by political scientists. The chapter is an invitation, on the one hand, for environmentalists to reflect more carefully on the role of
the state and, on the other hand, for political scientists to directly engage with pressing environmental questions.

From the environmental sciences I borrow the concept of deforestation, a wealth of research on the drivers of deforestation, and a general awareness of the ecological characteristics of tropical rainforests. From political science I borrow the concept of the state, research on the social origins of state strength, and the contributions of two emerging research agendas: one that examines state strength at the subnational level, and one that explores the politics of enforcement. As this chapter illustrates, both research agendas are indispensable to understanding landscape transformations like Amazon deforestation insofar as they consider the role of territorial unevenness and the existence of different dimensions of state authority (e.g., state capacity, state autonomy, state functions, state legitimacy, etc.).

While much comparative scholarship on the state aims to conceptualize and measure these various dimensions of strength at the national level, an emerging research agenda has begun to highlight the subnational dimension of state strength. However, this new line of inquiry tends to conceive subnational stateness as a single dimension of state strength, discounting the fact that subnational stateness itself has many dimensions. I devote two sections of this chapter to thinking carefully, both deductively and inductively, about the dimensions of subnational stateness and the possible relationships between them. I propose that recognizing the state’s unevenness and the existence of

21 See for example Boone (2003); Enriquez, Sybblis and Centeno (2017); Giraudy and Luna (2017); González et al (2002); Harbers (2015) and Luna and Soifer (2017).
different dimensions of state authority at the subnational level is necessary to understanding the role of the state in Amazon deforestation.

The present chapter consists of four parts, in addition to this introduction. The first section offers an overview of scholarship on the drivers of deforestation with a focus on the role of political variables. The second section draws on the political science literature in defining the dissertation’s most important theoretical concepts. The third section underscores the importance of the ecological characteristics of the state’s peripheries in determining how and to what extent they can be socially constructed or deconstructed. The final section concludes by highlighting the relevance of our core theoretical concepts to the dissertation’s overall argument and empirical case studies.

2.2. Literature on Amazon Deforestation and the Role of Politics

2.2.1. Defining Deforestation, Agrarian Colonization and the Study of Cumulative Deforestation

My dissertation does not offer a novel concept of deforestation but rather relies on existing definitions of deforestation, forest degradation, afforestation, and reforestation present in the environmental sciences literature (Humphreys, 2013; Lund, 2018). While the first two concepts (deforestation and forest degradation) describe a negative impact on the forest, the latter two (afforestation and reforestation) designate the opposite. Since forests are susceptible to both degradation and regeneration, they can be understood at a strictly theoretical level as renewable resources. In reality, however, the deforestation of
tropical rainforests exceeds its rate of renewal due to unsustainable practices characterized by overexploitation (Hendee, Dawson, & Sharpe, 2012).22

By deforestation I mean “the comprehensive removal of forest cover and the subsequent conversion of land to non-forest uses” (Castree, Kitchin, & Rogers, 2013). The practice of clearing the forest is not new and has long occurred in most parts of the world (Williams, 2003).23 Forest degradation differs from deforestation in that the latter requires a land-use change: “there is no deforestation if there is a guarantee of continuity in maintaining the forest cover” (Lanly, 2003, p. 15). While forest degradation does not reduce forest cover, it negatively affects the forest’s ecological qualities. By contrast, reforestation and afforestation both entail the planting of trees on treeless lands. Reforestation occurs where forests were recently cut down, while afforestation happens on treeless land that has not recently experienced deforestation.

Given the historical orientation of my research project, I focus on cumulative deforestation rather than annual deforestation rates. The idea of cumulative deforestation, however, may raise concerns about possible teleological or deterministic assumptions. As mentioned above, net gains in forested territory are conceivable. Deforestation can be reduced, and there are examples of developed and developing countries where significant reductions have occurred (Angelsen & Rudel, 2013). But as this dissertation illustrates,

---

22 For this reason, the characterization of tropical rainforests as renewable resources has always been a matter of debate (Gomez-Pompa, Vazquez-Yanes, & Guevara, 1972).
23 For example, the name “Pennsylvania” honors the colony’s founder (William Penn) and the heavy forests that characterized the region’s landscape at the time (the Latin *sylva*).
gains in the Colombian Amazon region have in fact been low. Furthermore, I discount recovered forest area in my measurements of cumulative deforestation (see Appendix A).

Lamentably, the literature on tropical deforestation and studies of agrarian colonization have hardly spoken to one another.\textsuperscript{24} As a consequence, scholars of deforestation are often unaware of the enduring social forces shaping their object of inquiry, while scholars of agrarian colonization rarely explore the ecological implications of colonizing forest areas. By agrarian colonization I mean the social process of settlement that is strongly associated to the expansion of agricultural land. To be clear, deforestation and colonization of forest land are not identical phenomena despite the fact that they both refer to a land use change and because deforestation can occur without colonization (e.g., extractive logging). Logically, deforestation is the broader phenomenon that encompasses colonization. However, the colonization of forest land almost by definition requires its deforestation (Angelsen & Kaimowitz, 1999; Busch & Ferretti-Gallon, 2017).\textsuperscript{25} There is usually high deforestation where agrarian colonization has advanced.

2.2.2. The Main Drivers of Tropical Deforestation

In this section, I provide a brief overview of the literature on the drivers of tropical deforestation, with a particular focus on the role of politics. Reviewing the literature will help us gauge the complexity of the phenomenon, recognize the way

\textsuperscript{24} See Rudel (2007) and Dávalos et al. (2016) for inspiring exceptions.
\textsuperscript{25} The relationship between colonization and deforestation is so strong that the Colombian state, when interpreting satellite images, tends to conclude that a particular area is unoccupied by peasants if it is covered by forests.
political variables have been marginalized in mainstream studies, and identify a set of expectations about the role of state institutions in deforestation.

A complex set of factors drive Amazon deforestation. One recent bibliometric analysis determined that the study of deforestation has, for the most part, been dominated by disciplines like plant science, environmental science, ecology, botany, and agronomy (Aleixandre-Benavent, Aleixandre-Tudó, Castelló-Cogollos, & Aleixandre, 2018). The analysis found that 2,051 peer-reviewed research articles on deforestation have been published since 1954, and that the field is growing rapidly.\textsuperscript{26} Although academic interest in the study of deforestation began to increase around 1980, at least 50% of the articles in question have been published since 2008, and “Amazonia” is the word that appears most frequently in this body of work. The best explanation for this increased academic output is a heightened political commitment to stopping or slowing down tropical deforestation (Chomitz, 2007; Humphreys, 2013). Most mainstream scholarship assumes that consequential policy decisions depend on the production of relevant data about forest loss and rigorous scientific knowledge of its drivers.

However, while existing scholarship on deforestation recognizes a distinction between the phenomenon’s \textit{proximate} and \textit{underlying} drivers (Geist & Lambin, 2002; United Nations, 1996), most mainstream research focuses on the former to the exclusion of the latter. The proximate drivers of Amazon deforestation are typically defined as localized human activities that “originate from intended land use and directly impact

\textsuperscript{26} The actual universe of relevant articles is probably larger since the bibliometric study was limited to peer-reviewed articles that included the word “deforest*” in their title.
forest cover” (Geist & Lambin, 2002, p. 143)—in other words, the concrete and immediate actions that impact the use of land and the fate of standing forests. According to Geist and Lambin, “the extension of overland transport infrastructure, followed by commercial wood extraction, permanent cultivation, and cattle ranching, are the leading proximate causes of deforestation” (2002, p. 146).

By contrast, the underlying drivers of deforestation are defined as the “fundamental social processes, such as human population dynamics or agricultural policies that underpin the proximate cause” (Geist & Lambin, 2002, p. 143). Underlying drivers are associated with economic and market distortions; policy distortions (e.g., incentives for unsustainable exploitation and land speculation); insecurity of tenure or lack of clear property rights; an absence of economic opportunity; government failures in intervention or enforcement; infrastructural, industrial, or communications developments; new technologies; and population pressures (United Nations, 1996). Efforts to study these underlying factors are relatively uncommon since causal inference and precise measurement are more difficult to achieve. Given these difficulties, scholars tend to concede the impossibility of developing “universal” theories of deforestation, instead emphasizing diverse regional and temporal pathways generated by interactions among the various proximate and underlying drivers listed above (Geist & Lambin, 2002; Rudel, 2007; Rudel, Defries, Asner, & Laurance, 2009).

In addition, social and political variables tend to be understudied or oversimplified in the mainstream literature on deforestation. In fact, the absence of serious engagement with the social, political, and economic factors underlying
deforestation has become a source of complaint. After analyzing the most frequently-used words in deforestation studies, the bibliometric study mentioned earlier concluded that “the social component is almost non-existent in our research” (Aleixandre-Benavent et al., 2018). Political variables thus play no vital role in a field of research that is by and large concerned with the proximate drivers of deforestation.

If political variables are considered secondary, then what are the main drivers of deforestation, according to existing scholarship? The answer, in short, is mostly focused on economic variables. There is a debate in the literature over the relative contribution of economic development activities, with three identifiable positions. The first suggests that economic development leads to deforestation by increasing demand for natural resources and food. A second, contradictory position holds that poverty i.e., the absence of development is the primary cause of deforestation, with the implication that “growth leading to poverty reduction will solve environmental problems” (Baland, Pranab, Sanghammitra, Mookherjee, & Sarkar, 2007, p. 216). The third position argues for an inverted U-shaped relationship in which deforestation will be low when economic development is either low or high but high when development is on the rise. The academic literature speaks of “forest transitions” in characterizing patterns of deforestation as they relate to different levels of economic development (Mather, 1992; Rudel, 1998). Interestingly, scholars have pointed out (though not sufficiently studied)

27 Interdisciplinary research considering the role of social phenomena has been a serious concern of forest-related research (Dobbertin & Nobis, 2010; Innes, 2005).
28 Scholars have applied the environmental Kuznets curve to the study of deforestation (Ehrhardt-Martinez, Crenshaw, & Jenkins, 2002).
the fact that forest transitions are not automatic but contingent on political interventions (Barbier & Tesfaw, 2015; Rudel et al., 2005).

As this debate illustrates, the extent of economic development constitutes an important baseline in explaining deforestation. Additionally, the literature highlights the role of particular economic sectors like timber and agriculture, the relative weight of which varies depending on the country. “Forests are cut down for one of two reasons: because they are worth more as timber than they are standing, or because alternative land uses are worth more than standing forests” (Humphreys, 2013, p. 81). In South America, agriculture is the most significant driver of deforestation (Armenteras & Rodríguez, 2014; Fernández & Garay, 2019). The negative effects of agriculture are so extensive that the standard concepts of deforestation were designed to capture them. Deforestation, as noted above, is defined in terms of a permanent change in land-use, which typically means conversion into cropland or pastures. Unsurprisingly, many economic models conceptualize deforestation as the result of competition between the rents of farming and the rents of the forest, with deforestation increasing whenever the former exceed the latter. Competition is conceived as a zero-sum game in which standing forests are the opportunity cost of agriculture and timber production (Barbier & Burgess, 2001).

Given the strong relationship between agriculture and deforestation, scholars have determined that factors known to increase agricultural rents also tend to fuel

---

29 There is no consensus that timber extraction has a similar impact on deforestation. Its impact, however, may be indirect: logging makes forests more accessible, which facilitates major transformations of the landscape. However, there are also reasons to believe that regulated logging increases the rent of the forest and, therefore, weakens incentives for land clearance (Angelsen & Kaimowitz, 1999, p. 76).
deforestation. For example, the literature strongly and consistently supports the finding that built infrastructures promote deforestation.\textsuperscript{30} Tropical deforestation typically occurs close to roads, urban centers, and previously cleared land (Angelsen & Kaimowitz, 1999; Busch & Ferretti-Gallon, 2017; Chomitz, 2007; Geist & Lambin, 2002). Built infrastructures promote deforestation by making forests accessible, reducing transportation costs, and increasing the value of land (Pfaff, Amacher, & Sills, 2013).\textsuperscript{31}

Understanding the vital role of agriculture as a driver of deforestation is also key to comprehend the causal significance of certain biophysical attributes. Scholars have found that good soil promotes deforestation, whereas high elevations and steep slopes render it less likely (Angelsen & Kaimowitz, 1999; Busch & Ferretti-Gallon, 2017).\textsuperscript{32} These biophysical characteristics affect tropical deforestation by shaping the prospects of agricultural development. My dissertation does not challenge these strong findings but rather builds on them in considering the possible influence of factors like soil quality, altitude, and slope.

Finally, mainstream academic studies of the drivers of tropical deforestation take demographic variables like population size into account, with some suggesting that larger populations promote deforestation. Although growing populations are indeed associated with the unsustainable consumption of natural resources, it is not necessary to exaggerate the role of demographic variables (Armenteras & Rodríguez, 2014; Geist & Lambin,

\textsuperscript{30} In fact, to the best of my knowledge, there are no studies on tropical deforestation that challenge the idea that built infrastructures promote deforestation.

\textsuperscript{31} However, the academic literature suggests that although built infrastructures promote deforestation, infrastructure building can occur after initial forest clearance.

\textsuperscript{32} Proximity to water and climate are not consistently significant in explaining deforestation (Busch & Ferretti-Gallon, 2017).
Neo-Malthusian arguments about the negative effects of population growth have numerous limitations. For example, studies have found that deforestation tends to be low where indigenous lands have been recognized, suggesting that population numbers alone are insufficient to explain forest loss. The problem is not people but what they do.

2.2.3. An Emerging Field on The Politics of Deforestation

I have thus far suggested that politics is not usually conceived as one of the main drivers of tropical deforestation. To be sure, from the fact that politics plays a secondary role in most mainstream accounts of tropical deforestation, one should not conclude that the topic is entirely absent from the literature. In fact, most peer-reviewed studies of tropical deforestation offer some amount of policy discussion at the end. Scholars tend to use the concluding sections of their articles to freely interpret the results, assert their opinions, and even make explicit policy recommendations. While they are happy to address politics in the form of post hoc speculation, however, far less frequently do scholars incorporate political variables into their research designs. For this reason, my dissertation attempts to expand the thematic horizons of the literature by bringing politics back into the study of tropical deforestation as one of its underlying drivers.

The literature on the political economy of tropical deforestation can be divided into two waves. The first examined the causes of environmental degradation, while the second focused on environmental conservation (Barbier & Burgess, 2001; Rudel, 2002).

Furthermore, studies of the role of demographic characteristics like age, gender, and education level are less conclusive (Busch & Ferretti-Gallon, 2017).
Roberts, & Carmin, 2011). The remainder of this section analyzes some of the central conclusions of these two bodies of scholarship.

The first-wave scholarship examined the role of politics as a driver of tropical deforestation. As one might expect, it emphasized that state policies aimed at promoting the proximate drivers of deforestation—namely, agriculture, infrastructure, and timber production—are the underlying drivers of deforestation (Angelsen & Kaimowitz, 1999; Geist & Lambin, 2002; Rudel, 2007). Beyond this connection, first-wave scholarship explored the institutional constrains within which tropical deforestation occurs, underscoring the importance of political development as well as economic development (Barbier, 2019). For example, scholars conducted large-N, cross-national studies to explore whether democratic regimes and capable states are good for the forest. While democracies with capable states tend to deforest less than non-democratic regimes with weak states, developing countries in the process of consolidating both democratic regimes and capable states tend to exhibit high deforestation rates (Buitenzorgy & P J Mol, 2011; Karsenty & Ongolo, 2012; McCarthy & Tacconi, 2011). The literature thus concludes that democracies and capable states are good for the forest after a certain threshold is passed. As with economic development, the scholarship finds that a Kuznets curve best describes the relationship between deforestation and political development.

---

34 This literature has at least two limitations: first, economic development is strongly associated with political development (democratization and state capacity) and, second, the underlying causal mechanisms are rarely studied. One might hypothesize that democracies, unlike authoritarian regimes, provide opportunities to mobilize both pro-deforestation and anti-deforestation demands (Barbier, 2019).
The question of political development has also been studied with reference to more specific phenomena like undefined property rights, insufficient law enforcement, criminality, warfare, and corruption (e.g., Amacher, Ollikainen, & Koskela, 2012; Dávalos et al., 2011; da Veiga Mendes, 2009; Fergusson, Romero, & Vargas, 2014; Karsenty & Ongolo, 2012). Thus, it has become commonplace to claim that deforestation occurs where the state is weak, fragile, or non-existent (Irland, 2008). However, an important limitation of this scholarship is that it rarely acknowledges the strong link between economic and political development. High levels of economic development typically accompany the consolidation of democracy and the strengthening of the state. While the final product of state-building processes might produce low rates of deforestation, the processes themselves do not. Most studies of the politics of deforestation hold economic development constant and ignore the fact that areas already cleared of forest cover tend to be the most politically and economically integrated. Although contemporary deforestation occurs where state institutions are weak, deforestation enables the institutionalization of state territories.

The second wave of scholarship examined the efficacy of state policies and social projects aimed at preventing or slowing tropical deforestation (Rudel et al., 2011). Thus, even if politics is not considered a primary driver of deforestation, it enjoys an important place in academic discussions of environmental conservation. While mainstream studies

---

35 It is worth differentiating private property from privatization, state capacity from state formation, democracy from democratization, and institutional strength from institutionalization.
of the causes of deforestation generally assume that politics is relatively unimportant, the scholarship on potential solutions tends to place political variables up front.

It has been claimed, for example, that forest transitions (the threshold beyond which economic and political development reduces deforestation) are the result of forest scarcity, economic development, and efficacious public policies (Barbier & Tesfaw, 2015; Rudel et al., 2005). There are also fruitful debates about the real effects of protected areas on forest cover. While some defend their efficacy (Armenteras, González, & Retana, 2013; Armenteras, Rodríguez, & Retana, 2009), others suggest that, given their location and biophysical characteristics, the effect is small (Joppa & Plaff, 2009). Still other studies have analyzed the role of law enforcement (Alcañiz & Gutiérrez, 2018; Burgess, Hansen, Olken, Potapov, & Sieber, 2012; Fernández & Garay, 2019), land tenure (Robinson, Holland, & Naughton-Treves, 2014), and community forestry (Lemos & Agrawal, 2006; Ostrom, 1992), even as their empirical conclusions are debatable (Busch & Ferretti-Gallon, 2017; L. Dávalos, Holmes, Rodríguez, & Armenteras, 2014). There is also an emerging interest in the effects of policies aimed at introducing market incentives (Jodoin, 2017).

The second-wave literature has at least two limitations that my dissertation seeks to address. On the one hand, second-wave studies have mostly focused on the impact of environmental policies on particular environmental outcomes without considering the political process or development forces involved. One the other hand, given that most environmental policies are of relatively recent origin, the literature tends to assume short-
term horizons that discount the fact of deforestation as a historical process that occurred in many parts of the world (Rudel & Roper, 1997; Williams, 2003).

An important contribution of this dissertation, therefore, is the historical perspective it brings to the study of deforestation (Pierson, 2004). Past political strategies have bequeathed profound legacies in the Amazon, legacies which in turn constrain contemporary anti-deforestation efforts. One of the main challenges is confronting the legacies of the past, and yet most quantitative research on tropical deforestation is limited by the availability of data to the transformations of the twentieth-first century.

2.2.4. Amazon Deforestation

The scholarship on Amazon deforestation has overwhelmingly focused on the case of Brazil, which is historically and currently the country with the largest area of deforested land per year (Charity, Dudley, Oliveira, & Stolton, 2016). While Brazil long served as the benchmark against which scholars analyzed the region as a whole, the last two decades have seen a proliferation of studies on Amazon deforestation beyond the Brazilian case (Kalamandeen et al., 2018). Even accounting for this trend, however, studies of deforestation in the Colombian Amazon were rare until a decade ago, as researchers tended to avoid forest-rich countries that “experienced rural violence during the last three decades of the 20th century” (Rudel et al., 2009).

Over the last decade, scholars have begun to produce reliable data on deforestation in Colombia. Although the literature on Colombia has certainly grown, it is
worth remembering that most of it was produced in the twenty-first century,\textsuperscript{36} that natural scientists have spearheaded the effort; that it largely focuses on the proximate drivers of deforestation; that the role of political variables remains understudied; and that few scholars have undertaken rigorous field research.\textsuperscript{37}

Implicit comparisons between the Colombian and Brazilian Amazon tend to accept that deforestation in Colombia is unplanned and chaotic (Armenteras, Rudas, Rodriguez, Sua, & Romero, 2006) while deforestation in Brazil (and Ecuador) is the consequence of state intervention and large-scale capital investments in agriculture (Nepstad et al., 2006; Rudel et al., 2009).\textsuperscript{38} The different spatial patterns in Brazil and Colombia can be interpreted as a sign of varying levels of state involvement (Mertens & Lambin, 1997). State intervention in Brazil has promoted a fish-bone pattern in which state-led infrastructure comprises the spine of multiple, branching private roads. The scholarship interprets the absence of this spatial configuration in Colombia as a sign of unplanned deforestation, which occurs in proximity to both roads and the most important rivers (Armenteras et al., 2006, p. 353).\textsuperscript{39} An additional sign of unplanned deforestation in Colombia is the presence of illicit crops: the literature finds that Colombian

\textsuperscript{36} In fact, the first study to measure historical deforestation rates in Colombia was published in 1999 (Vina & Cavelier, 1999, p. 31).
\textsuperscript{37} Most studies of Amazon deforestation in Colombia, all of them relatively recent, are based on Geographical Information Systems (GIS).
\textsuperscript{38} Wealthy and influential ranchers and planters are, in turn, very effective at securing additional state intervention. The synergy between high capital investments and active state intervention is one of the main drivers of Amazon deforestation in Brazil (Rudel, 2007).
\textsuperscript{39} See also (Etter, McAlpine, Phinn, Pullar, & Possingham, 2006; Viña, Echavarría, & Rundquist, 2004, p. 24).
Deforestation is influenced not only by legal farming but also by coca cultivation (L. M. Dávalos et al., 2011).

One of the contributions of my dissertation is to pose difficult questions for this literature by highlighting the important influence exerted by Colombian state on Amazon deforestation. A comparative study of cumulative deforestation at the subnational level can help us understand how and why the state has historically intervened.40

2.3. Beyond the Enforcement Paradigm: Dimensions of State Power

Although political scientists have rarely studied deforestation, a few ongoing research projects address the topic in the context of the literature on enforcement and subnational state strength. My dissertation benefits from these two literatures and contributes to them by exploring the social origins of both phenomena (Falleti, 2019). The current section recommends taking at least three steps back from intent-based approaches to enforcement in order to better grasp the relationship between the modern territorial state and deforestation. Figure 2.1 below depicts the conceptual logic of these steps, illustrating the way research questions on the politics of enforcement are premised on the existence of a minimum of state strength, which in turn is premised on state territorial reach (STR) and state scope.

---

40 See Dávalos et al. (2016) for an interesting study on the enduring legacies of state-directed colonization.
2.3.1. Scratching the Surface: The Enforcement Paradigm

Recent studies in political science tend to conceive deforestation as a relatively new policy area that requires the attention of both the state apparatus and local actors (Alcañiz & Gutiérrez, 2018; Fernández & Garay, 2019; Slough & Urpelainen, 2019). By focusing on the effectiveness of state policies and institutions aimed at stopping or slowing deforestation, these studies attempt to determine if effective enforcement of illegal clearing is ultimately consequential in reducing deforestation. Despite many differences, they all tend to accept the assumption that curbing tropical deforestation requires “understanding why illegal extraction is often sanctioned or facilitated” (Burgess et al., 2012, p. 1708). Such studies thus limit the role of the state to effective enforcement of anti-deforestation laws. On this reductionist view, when deforestation is declared illegal, the problem then becomes a lack of enforcement.

The focus on enforcement benefits from a fruitful research agenda in political science on the politics of enforcement and coincides with the expectation that Amazon deforestation has increased in Colombia as a result of anarchy (see Chapter 1). The “enforcement paradigm” applied to deforestation dynamics involves the study of
environmental laws (as juridical claims), environmental outcomes (as social practices) and the subnational variation of the mismatch between what should happen and what actually happens (Brinks, Levitsky, & Murillo, 2019).

By contrast, my dissertation argues that research focused on the enforcement of environmental laws only scratches the surface of a complex phenomenon linked to configurations of state power at the subnational level. “While a focus on implementation capacities remains important, an emphasis on such issues effectively ‘puts the cart before the horse’ if equal attention is not paid to capacity issues associated with the ‘upstream’ aspects of policy-making agenda setting, framing, analysis, and policy development and design” (Sagar & VanDeveer, 2005, p. 16). In our case, deforestation dynamics are influenced by enduring historical trajectories (Pierson, 2004) related to economic development and population dynamics (Geist & Lambin, 2002; Rudel et al., 2009).

Comparative scholarship on the politics of enforcement highlights the fact that enforcing the law depends not only on the overall strength of the state but also on the willingness to act (Levitsky & Murillo, 2009, 2013). It openly questions capacity-based approaches that tend to ignore the political processes shaping enforcement dynamics, even positing variation in state strength as a null hypothesis to be rejected (Bozçağa & Holland, 2018). An important example from this research is Holland’s idea of *forbearance*, which she defines as “intentional and revocable government leniency toward violations of the law” (2016, p. 233). Despite her emphasis on voluntary non-enforcement, Holland is aware that the politics of enforcement do not play out in a vacuum. She thus recognizes the importance of a minimum of state strength and
conceives forbearance in terms of a combination of capacity, intention, and revocability.

“It is nonsensical to talk about forbearance in parts of Sierra Leone or Haiti where the state apparatus barely penetrates society” (Holland, 2016, p. 233).

One implication of adopting this minimal threshold as a criterion is that studies of the politics of enforcement tend to focus on urban areas, capital cities, or industrialized environments in which a minimum of state strength is taken for granted (Amengual, 2016; Bozçağa & Holland, 2018). Justified by pervasive institutional weakness in Latin America (Levitsky & Murillo, 2009), the enforcement literature has focused on the most developed parts of the region, where the mismatch between norms and reality is already small. Instead of conceiving state strength as a structural constraint on enforcement (Amengual, 2016), my dissertation conceives it as a condition of possibility. While state strength alone cannot explain compliance, a minimum of strength is necessary before we can even approach the political puzzles associated with enforcement (Brinks et al., 2019, p. 22).

A major challenge for the enforcement scholarship is overcoming the limitations of both capacity-based approaches that ignore elite interests and intent-based approaches that overlook the role of state strength. I propose that the relative importance of willingness and capacity depends on the territorial manifestations of state strength. In places where wealth and power are concentrated, intent-based approaches can provide

---

41 See Bozçağa and Holland (2018) on Enforcement Process Tracing as a possible method for carefully adjudicating between competing claims of state strength and political willingness. “We suggested a series of causal process observations to strengthen arguments that politicians, rather than weak states, contribute to limited enforcement” (p. 317).
more leverage than capacity-based approaches. By contrast, in the peripheries of the
state, the question of willingness tends to be less important. The academic literature on
the politics of enforcement stands to benefit enormously from a serious reckoning with
the uneven strength of the state, which is the first of the three steps required to understand
the relationship between Amazon deforestation and the state.

2.3.2. First Step Back: The Infrastructural Power of the State and the Concept of
Territorial Integration

To make the argument that a minimum of state strength is an antecedent
dimension of enforcement and its political puzzles, we must first clarify what state
strength is and what its various dimensions consist of. Fortunately, scholarship on the
infrastructural power of the state has witnessed a revival in tandem with the growth of
scholarship on the politics of enforcement. In studying Amazon deforestation, I
contribute to this literature by probing the ecological implications of the origins and
development of the state.

Given that public interest in reducing deforestation is relatively recent (Williams,
2003), a historical analysis of cumulative deforestation cannot limit itself to the narrow
question of anti-deforestation law enforcement. I thus adopt a different approach, one that
moves away from an “enforcement paradigm” emphasizing environmental policies and
the sectoral capacities to implement them. Instead, my dissertation builds on classic
literature about the origins and development of state power (e.g., Centeno, 2002; Mann,
1984; Tilly, 1992) in order to explore the underlying relationship between deforestation and the modern state.

The study of the modern state—its characteristics, causes, and consequences—is certainly a foundational topic in political science. Conceptualizations of the state are manifold. Drawing on Weber’s classical definition, I conceive the state as a “form of human community that (successfully) lays claim to the *monopoly of legitimate physical violence* within a particular territory – and this idea of ‘territory’ is an essential defining feature” (M. Weber, 2004, p. 33). Hence, I define the state by its means rather than its ends, implying that states are political organizations capable of pursuing a wide variety of goals depending on historical context. Hitler’s Germany and Mandela’s South Africa are both modern states despite their obvious differences. Weber provides a useful, minimal, and procedural definition of the modern state, one based on the exercise of authority over a particular territory through a monopoly on legitimate (institutionalized) violence.\(^4\) I thus conceive the state as a territorialized form of political domination in which authoritative power and territorial closure are both defining attributes.

Political science scholarship notes that states can be “strong” or “weak” depending on their ability to exercise power and “get things done” (Mansbridge, 2012), that is, to achieve their intended objectives. But this concept is still too general to be empirically useful. What exactly is meant by state capacity? To answer this question, I

\(^4\) Despite the utility of Weber’s concept, many critiques have been lodged against it. Some claim that Weber's conception of the state discounts the importance of symbolic violence (Bourdieu, 2014), ignores fuzzy state-society relations, and neglects the everyday practices of the state in favor of an imagined coherence (Migdal, 2001; Mitchell, 1991). However, some of these critiques depend on a misinterpretation that turns Weber’s sociological ideal types into normative goals (Migdal, 2001). See Fukuyama (2013) for an influential misinterpretation.
build on Michael Mann’s distinction between despotic and infrastructural state power. Despotic power refers to the negotiation of state actions with civil society groups, while infrastructural power is “the capacity of the state to actually penetrate civil society, and to implement logistically political decisions throughout the realm” (Mann, 1984, p. 113). Mann’s different forms of power mirror Huntington (1968)’s distinction between government types and degrees.43 On the basis of Mann’s conceptual apparatus, I employ the idea of state strength to indicate high degrees of infrastructural power (Soifer & Vom Hau, 2008).

I already mentioned that the defining characteristic of the state—and, therefore, of state strength—is the territorially-bounded exercise of power. Few other concepts in political science include territoriality as an essential feature (see for example Herbst, 2000; Scott, 2009; Spruyt, 1994; Tilly, 1992).44 Mann himself pays particular attention to the role of territory in characterizing state power:

Only the state is inherently centralized over a delimited territory over which it has authoritative power. Unlike economic, ideological or military groups in civil society, the state elite’s resources radiate authoritatively outwards from a center but stop at defined territorial boundaries. The state is, indeed, a place – both a central place and a unified territorial reach (1984, p. 123).

Mann’s focus on territory has led some scholars to argue that the idea of infrastructural state power has both “social” and “spatial” dimensions (Eaton, 2012, p. 648; Soifer & Vom Hau, 2008, p. 226). However, Mann has clarified that the division

43 Despotic power resembles concepts like regime type, government type or even state autonomy. Infrastructural power, by contrast, approximate concepts like state capacity, state strength, and government degree (Mann, 2008).
44 One might argue that theories of the modern territorial state that fail to consider the complex role of geography are incomplete at best (Lustick, 1999, p. 92).
between society and territory is a false one. Both are aspects of the same phenomenon: “For me, the world ‘society’ is fairly empty. Instead, I mean control over people (and by people) insofar as they are located within the state’s territories” (Mann, 2008, p. 358). Hence, the infrastructural power of the state is relational, but its exercise is territorialized.

The concept of the infrastructural power of the state is useful to understand the idea of “territorial integration,” which is a vital concept of the theoretical proposal of this dissertation (see Chapter 3). Thus, the infrastructural power of the state is a form of authoritative power that radiates outwards. There is typically a center, characterized by “a high concentration of the main elements of authority and power in the social system” (Shue, 1988, p. 40), and a set of peripheries, which lack those elements for the reason that they have not been fully integrated into the state. In this context, integration is the process by which the center of authority and wealth expands into the peripheries and forms a single entity of multiple parts.45 Integration is a multifaceted phenomenon with at least three dimensions: political/administrative, economic, and normative/cultural (Shue, 1988, p. 40). Territorial integration increases the infrastructural power of the state and is a vital aspect of the macro-sociological process through which power is universalized and centralized (Bourdieu, 2014).

Although the infrastructural power of the state radiates outwards from a hierarchical center of authority, two important clarifications are in order. First, territorial integration is not always linear, and states can contract as well as expand (Lustick, 1993).

---

45 Although I prefer the term territorial integration to describe this process, I am aware of the existence of more radical alternatives. The concepts of internal colonialism (Hechter, 2017) and uneven development (Smith, 1990) are perhaps the most relevant.
Second, although territorial integration is traditionally conceived as a top-down process, the periphery is not simply a passive recipient of decisions emanating from the center. “How power is distributed between center and periphery, and how these imbalances are institutionalized, are partly artifacts of the organization of power within agrarian society itself” (Boone, 2003, p. 2). We can therefore hypothesize that the way in which power is organized at the subnational level shapes the state’s institution-building strategies.

The state accumulates infrastructural power through the integration of territory. However, state strength is not evenly distributed. Comparative political scientists are indebted to the work of Guillermo O’Donnell (1993), who offered a simple but powerful conceptual scheme for theorizing state unevenness and its implications for the consolidation of democratic regimes. O’Donnell argued that countries in the developing world tend to contain many extensive “brown zones,” where the presence of the state and its territoriality are weak. Unlike Norway, for instance, Peru and Brazil were mostly “brown.” Focusing on the processes involved in state-building, we can understand territorial integration as the process through which “brown zones” cease to be brown.

Despite wide recognition of the importance of territory and internal territorial unevenness, few scholars had seriously engaged O’Donnell’s powerful insights until recently. The subnational turn in comparative politics (Snyder, 2001) has been slow on this front. Comparativists have begun to question the “whole-nation bias” with its focus on national averages and the “best known places” (Gibson, 2012). But the subnational turn has mostly studied political regimes i.e., despotic rather than infrastructural power and the design and implementation of social policies (Eaton, 2017; Gibson,
Nevertheless, the situation is steadily changing as new scholars advance theories, methodologies, and empirical studies oriented towards understanding the uneven infrastructural power of the state at the subnational level. An enriching but still incipient research agenda on subnational state capacity has finally built upon O’Donnell’s insights. One of the main challenges of this emerging literature is to conceptualize and measure what state unevenness means. “Seeking more precise descriptions of relational state capacity at the local level is thus a crucial pending task for this research agenda” (Dargent, Feldmann, & Luna, 2017, p. 27).

Existing scholarship has underscored the importance of studying the relationship between state strength and state territorial reach (STR). STR is a dimension of state strength, one that I relate to what Mann calls the “logistics of political control” (1984, p. 116). Similarly, Giraudy (2012) argues that territorial reach is one of three core dimensions of state strength. For a state to be strong, on this view, it must have penetrating forms of territorial reach, sufficient autonomy from non-state actors, and bureaucratic capacity.

Although STR is a dimension of state strength, I argue that is an antecedent dimension. State strength is preceded by STR, which is a first-order concern of state authority. While STR without strength is a logical possibility, state strength without STR

---

46 (Boone, 2003, 2012; Enriquez et al., 2017; García Villegas, García Sánchez, Rodríguez Raga, Rebolledo, & Espinosa Restrepo, 2011; Giraudy & Luna, 2017; González et al., 2002; Harbers, 2015; H. Huntington & Wibbels, 2014; Luna & Soifer, 2017; Steinberg, 2018).

47 Given that states must reach a region before they can advance a state goal, the infrastructural power of the state is “partially conditioned” by state reach (Centeno, Kohli, Yashar, & Mistree, 2017, p. 10). State reach is an important aspect of the infrastructural power of the state, but it would be inaccurate to measure state capacity by counting the state officials present in a territory (Acemoglu, García-Jimeno, & Robinson, 2015, p. 2365).
is not. The vital role of STR is easier to understand on a less abstract level. Scholars have measured variation in stateness on the basis of survey data—for instance, considering the time it would take police to arrive after a call is placed (Luna & Soifer, 2017, p.8). Many parts of the developing world lack this minimal reach (Centeno, Kohli, Yashar, & Mistree, 2017; Herbst, 2000), and Colombia is no exception. Although survey-based measurements are designed to capture the whole country, they rarely consider that many people in the developing world live entirely beyond the sphere of influence of the police. Some regions lack telephone service, road networks, administrative means of transportation, and even police stations.

In conclusion, comparative scholarship on state infrastructural power recognizes the importance of the uneven exercise of state authority over territory. The rigorous study of this heterogeneous reality, I suggest, is necessary for understanding both state strength and the concrete institutional contexts in which intent-based approaches to law enforcement are meaningful.

2.3.3. Second Step Back: State Territorial Reach

Comparative scholarship has questioned the dichotomous classification of states as either “strong” or “weak.” However, the academic literature on STR tends to utilize equivalent dichotomous classifications of presence and absence. Given the historical expansion of states, pure “non-state spaces” have become rare (Scott, 2009). Few

48 A minimum of STR can be taken for granted in developed countries, though we cannot assume that STR is evenly distributed (Steinberg, 2018).
populations today are truly “out of reach.” Nonetheless, one can hardly conclude from this fact that STR is homogeneous. The state “does not spread evenly over entire territories. It remains concentrated in pockets and along communication routes” (Mann, 1984, p. 124). States reach most territories and populations, but they do so in different ways. Fernán González (2014) and his research team in Colombia aptly describe this phenomenon as the “differentiated presence of the state.”

Although it is important to recognize state unevenness, mere recognition does not clarify what the relevant differences are. A contribution of my dissertation is thus to provide a typology of the different varieties of STR. Scholars have developed similar proposals before (e.g., Boone, 2003; Giraudy & Luna, 2017; González, Bolívar, & Vásquez, 2002; Mann, 2005; Naseemullah & Staniland, 2016), which I briefly present here in order to clarify the novelty of my own contribution. One set of proposals underscores socio-historical dynamics. Michael Mann (1986) offers a typology of different forms of organizational reach distinguished by level of cooperation (extensive or intensive) and the presence or absence of an explicit command (authoritative or diffused).\footnote{Mann’s typology is not limited to the domain of the state: economic, ideological, and military power can also be understood through these lenses.} Similarly, González (2014) classifies different forms of state presence according to the way regions were populated, organized, and articulated to the center. Despite their important contributions, a major problem with these proposals is their underspecification of agents, power balances, and institutions.
A second set of proposals focuses on the balance of power between the center and the regional elites. Boone (2003)’s classificatory scheme is based on levels of concentration of state agencies within the territory and the distribution of authority among rural elites and state agents. Where state agencies are created at the local level, authority can devolve to rural elites (powersharing) or be centralized in the hands of state agents (usurpation). By contrast, where local state agencies are not created, state agents can centralize authority (administrative occupation) or cede it to rural elites (non-incorporation).50 Relatedly, Giraudy and Luna (2017) propose a typology of STR that considers the incentives and resources of state agents and “territorial challengers.” STR is “contented” when both state agents and territorial challengers possess high incentives and resources, while it is “unprojected” when incentives and resources are low. Intermediate forms of reach occur when only state agents (“unrestricted” STR) or only territorial challengers (“restricted” STR) possess high incentives and resources to control the territory. While this set of proposals recognizes the existence of a power relation between state agents and elites, it barely considers the role of state institutions.

The final typology of STR was developed by Naseemullah and Staniland (2016), who propose three types of indirect rule that can result from different legal frameworks and forms of implementation. They theorize that suzerain governance occurs when private rulers possess autonomous authority; hybrid governance occurs when private rulers share power with the state; and de jure governance occurs when “the state maintains de jure direct rule over a territory, but in reality coercion is enforced locally by

---

50 Chapter 3 further explains Boone’s idea of “non-incorporation.”
intermediate political elites” (Naseemullah & Staniland, 2016, p. 17). Though this proposal considers both actors and institutions, it leaves aside different types of direct rule.

Certainly, these five proposals take us a step further in understanding the varieties of STR, but they minimize the role of institutions and often assume simple ontologies focused solely on the physical world and (consequently) the deployment of state organizations or agents. Drawing on the insights of these proposals, and considering the importance of both institutions and complex ontologies, I offer a typology of STR based on the creation of state organizations at the local level (Boone, 2003), the type of rule (Tilly, 1992) and the breadth of state action (Mann, 1984) (see Figure 2.2).

The first element of my typology is inspired by Douglass North’s distinction between the players and the rules, that is, between organizations and institutions (North, 1990, p. 3). On the basis of this distinction, we can differentiate formal from organizational forms of STR. State reach is formal when institutional presence exists without the actual deployment of state organizations. Formal institutions and rules are capable of penetrating a region before state organizations do. Institutions and ideas travel fast because they are relatively unencumbered by physical obstacles, budget constraints, or travel allowances. Formal state reach is meant to capture the symbolic and ideational aspects of the state, which might be interpreted as part of the state’s “image”

51 Most types of STR reviewed here center on the physical world and leave aside ideational and institutional forms. My proposal, by contrast, is based on a complex yet limited conception of reality that builds on Popper (1994)’s three domains: physical objects, mental experiences, and products of the human mind. See also Hall (2003) on the methodological challenges of adopting complex ontologies.
(Migdal, 2001). Formal state reach is an idea without matter, which means that the state is present as its own specter. In light of this form of STR, “non-state” spaces or regions that remain “out of reach” are extremely rare (Scott, 2009).

![Diagram of State Organizations]

**Figure 2.2. Varieties of STR**

On my conceptualization, then, STR is first and foremost defined by the legal status of its authority. The existence of formal institutions is among the most important characteristic of the modern state (O’Donnell, 1993; Soifer, 2016; M. Weber, 1968): “the essence of the state’s functions is a monopoly of binding rule-making” (Mann, 1984, p. 112). The first variety of STR, therefore, captures the attempt to claim to rule both territories and populations through formal institutions (Nugent & Krupa, 2015). “Legal frameworks represent the clearest signals of state’s intentions of intervention and the self-defined extent of its authority” (Naseemullah & Staniland, 2016, p. 16). This is not to

---

Footnote: 52 This dissertation uses the terms “formal institutions” and “state law” synonymously.
neglect the existence of powerful non-state actors that exercise authority (Arjona, 2016; Naseemullah, 2014; Staniland, 2012), or to deny the latter’s sociological similarities to state authority.\(^{53}\) However, despite these characteristics, I assume that not every form of social authority embodies stateness. It is conceptually problematic to consider non-state actors, their order and authority, as part of STR.\(^{54}\)

Purely formal state reach can also be consequential. Scholars have recognized the vital role of *de jure* statehood in shaping enduring state-building trajectories in the developing world. The international respect for formal territorial borders regardless of *de facto* state power to defend them is a clear example of this (Centeno, 2002; Herbst, 2000; Jackson & Rosberg, 1982).\(^{55}\) And within a given territory, the winning of hearts and minds can prove even more consequential than fear of direct enforcement, as scholars of sociological institutionalism have observed (Falleti, 2019). So long as local actors have internalized formal institutions, they can exert state power even in the absence of state organizations.

The state, however, is not only an institution but also \(^{56}\) as Michael Mann (1984) points out \(^{57}\) an organization that promotes compliance with the law and implements diverse policies. When state agencies are deployed, the state becomes both an institutional and organizational project. Once both forms of STR are present, we can then identify additional types of rule. The scholarship on state formation and colonialism tends

\(^{53}\) Charles Tilly famously proposed an analogy linking war making, state making, and organized crime (1985, p. 181).

\(^{54}\) STR does not exist when non-state actors alone rule a particular region, as armed actors do in many Colombian municipalities (Arjona, 2016).

\(^{55}\) There is typically a complex international political process associated with the international recognition of sovereign states (Coggins, 2014).
to accept the distinction between direct and indirect rule (see for example Tilly 1992),
which hinges on whether state agencies monopolize authority or delegate it to local
leaders (Boone, 2003, p. 37). When state bureaucracies do not govern a particular region
by themselves, I characterize STR as delegated: that is, institutional, organizational, and
indirect.56

By contrast, when state agencies retain power, STR is institutional,
organizational, and direct. In these cases, a final distinction comes into play, namely the
breadth of state functions, which can be narrow that is, focalized or wide that is,
promiscuous depending on the number of discrete objectives that state authorities
pursue in a particular region. The army is a typical example of focalized STR because it
rarely intervenes in local affairs unless a security threat is perceived (Slater 2010). By
contrast, municipalities are a clear example of promiscuous reach, in which local
bureaucrats are responsible for performing a variety state functions.57

In sum, this section has shown that states exercise different forms of reach, which
in turn constitutes an antecedent dimension of state strength and the political puzzles of
enforcement. Drawing on existing literature, I offered a typology of state reach that
distinguishes different forms by considering state organizational presence, type of rule,
and breadth of action.

---

56 For example, in the Colombian Amazon, until the mid-twentieth century, the government delegated state-
like functions to the Catholic Church. Chapter 4 illustrates how the Catholic Church was once tasked with
conflict resolution, land titling, education, and infrastructure building (Bonilla, 2006; Kuan, 2015; Uribe,
2017).
57 Mann (1986, p. 26) emphasizes that states are functionally “promiscuous:” they are neither coherent nor
monolithic, and have many functions.
2.3.4. Third and Final Step Back: The Scope of the State

Acknowledging diverse forms of STR tells us little about the particular goals that states pursue in the Amazon. In historical terms, the phenomena are related insofar as the objectives of the state tend to promote particular types of state organization. The scope of the state typically precedes its territorial reach because policy goals are what drive the construction of STR. Charles Tilly (1985) argues, for example, that in Europe “each of the major uses of violence—war making, state making, protection and extraction—produced characteristic forms of organization” (p. 181). While armies and navies resulted from war making activities, tax collection agencies were largely the consequence of financial necessities. The state’s objectives are thus closely associated with organizational developments on the ground: “the goals for which infrastructural power is used may affect how it is deployed and the actual outcomes it generates” (Soifer & Vom Hau, 2008, p. 228).

Thus far, I have offered conceptualizations of state strength and state reach centered on means rather than ends (Mann, 1986; M. Weber, 1968). Comparative scholarship assumes procedural definitions, but empirical studies tend to focus on particular state goals and functions (Berwick & Christia, 2018) such as information (Scott, 1998; Soifer, 2013), war making (Centeno, 2002; Thies, 2005; Tilly, 1992), and tax collection (Levi, 1989; Lieberman, 2002). In this context, I propose that the theoretical and empirical study of the state stands to benefit from acknowledging both the existence of less traditional state goals and the fact that the scope of the state has expanded over time (Kurtz, 2013; Soifer, 2016). For example, the liberal state of the
nineteenth century was barely involved in the provision of social welfare. During the late nineteenth and early twentieth centuries, due to the heightened significance of the so-called “social question,” the scope of the state markedly expanded. New state infrastructures were developed as new demands for state involvement were articulated (Kurtz, 2013).58

How can we best characterize the goals of the Colombian state in the Amazon? Table 2.1 below represents a preliminary mapping that emerged inductively from my fieldwork in the Amazonia foothills and is intended to reduce the complexity of the state’s diverse and often contradictory objectives (Migdal, 2001). The scope of the state in the Amazon is influenced by at least by four sectoral agendas—agrarian, extractive, environmental, and ethnic—which each have characteristic land-use planning institutions and particular orientations towards the active promotion of economic development.

Table 2.1
State Agendas, Institutions, and Orientations Towards Development

<table>
<thead>
<tr>
<th>Sectoral agenda</th>
<th>Characteristic Land-Use Planning Institution</th>
<th>Orientation (Development Promotion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agrarian</td>
<td>Individual land property</td>
<td>Developmental</td>
</tr>
<tr>
<td>Extractive</td>
<td>Individual property and concessions</td>
<td></td>
</tr>
<tr>
<td>Environmental</td>
<td>Forest Reserve / National Parks</td>
<td>Non-developmental</td>
</tr>
<tr>
<td>Ethnic</td>
<td>Indigenous reservations</td>
<td></td>
</tr>
</tbody>
</table>

Since different regions have been integrated according to different agendas, I will describe each in sequence. The agrarian agenda is characterized by the interest of the

---

58 See Kurtz (2013) for an interesting discussion of the ways the social question shaped state-building trajectories in Latin America. The author argues that in countries where mass mobilization began prior to the Great Depression, state building became difficult as conflict quickly escalated and locked in.
state in promoting the development of commercial agriculture. Thus, landowners, peasants, ranchers, and rural employees tend to be the beneficiaries of this sectoral agenda. The *extractive agenda* promotes the development of extractive industries like oil or mining.\(^{59}\) The beneficiaries of this agenda are the companies, employees, merchants, and other local contractors that directly or indirectly profit from extractive activities. The *environmental agenda* aims to protect the environment by either prohibiting or regulating certain economic activities. The main beneficiaries of this agenda are those who are affected by the negative externalities of damaging economic activities.\(^{60}\) Finally, the *ethnic agenda* promotes the recognition of indigenous rights and the incorporation of indigenous peoples as non-subordinated citizens. In the Amazon, indigenous peoples tend to be the direct beneficiaries of the ethnic agenda and have received additional attention from the state as compensation for centuries of exclusion and violence.\(^{61}\)

The four sectoral agendas are instantiated through concrete planning institutions that regulate both the use and acquisition of land. These institutions determine what can be done with land, where, and under what conditions. Land use has traditionally been linked to ownership, which means that institutions regulating land ownership also tend to affect how land is used (Unruh, Cligget, & Hay, 2005). Land-use planning institutions

---

\(^{59}\) The extractive agenda of the state can benefit large or small-scale projects, and those projects can be led either by private actors or state-owned companies.

\(^{60}\) Environmental harms are characterized as “negative externalities” when they are caused by production or consumption activities but affect people other than the beneficiaries of those activities (Black, Hashimzade, & Myles, 2017). However, the beneficiaries of the environmental agenda are not limited to those who directly suffer the negative externalities of a particular activity. Theoretically, the environmental agenda stands to benefit future generations, humanity at large, and other living beings (Dobson & Eckersley, 2006; Nash, 1989). Furthermore, it carries potential benefits for those implementing the policies and projects aimed at protecting the environment (Jodoin, 2017; Robinson, Holland, & Naughton-Treves, 2014).

\(^{61}\) The ethnic agenda is not limited to indigenous groups. However, as Chapter 3 explains, indigenous groups are, at least numerically, the most important participants in the ethnic agenda in the Amazon.
can be understood as claims to the ownership and governance of territory, typically pursued by a diverse set of social actors.

The recognition of individual property rights tends to be the most important and characteristic land-use planning institution of the state’s agrarian and extractive agendas (Besley & Persson, 2009; Blomley, 2015; De Soto, 2000). In addition to the institution of private property, the extractive agenda also depends on mining concessions exclusionary rights of exploitation that do not require the recognition of land ownership (Rodríguez, 2017). When it comes to the environmental agenda, reserve forests and protected areas for conservation are the two most important land-use planning institutions (Leal, 2017; Nepstad et al., 2006). Finally, indigenous reservations, a unique form of collective property, constitute the characteristic land-use planning institution of the state’s ethnic agenda in the Amazon.62

These four sectoral agendas and their associated land-use institutions can be classified into two additional categories on the basis their overall orientation towards developmental activities. Considering the role of the state in relation to economic development, it becomes clear that the state has at least two distinct faces (Bourdieu, 2014). One face—associated with the agrarian and extractive agendas—is essentially committed to promoting economic development, while the other—associated with the environmental and ethnic agendas—is not.

---

62 Afro-Colombian communities also have land rights in Colombia. However, given different historical and spatial patterns of internal migration and displacement, the collective land of Afro-Colombian communities tends to be concentrated on the Pacific and Caribbean coasts (Asher, 2009).
Given that political scientists and economists have long used the terms “developmental” and “non-developmental” to describe the state, a clarification is necessary (see for example Evans, 1995; Kohli, 2004). Scholarship on the developmental state described the way states play an essential role in promoting economic development by providing not only basic public goods (Huber, 1995) but also the infrastructure and institutions that facilitate economic cooperation (e.g., Lange & Rueschemeyer, 2005). My dissertation uses the same terms but in a slightly different way.

My goal is not to designate the state “developmental” but rather to classify the state’s four sectoral agendas into two categories. I assume that states are diverse and often internally incoherent forms of political domination that pursue a range of potentially conflicting goals (Migdal, 2001) and commitments with respect to the promotion of economic development. By classifying the state’s four sectoral agendas as either “developmental” or “non-developmental” (see Table 2.1), I recognize the way the state pursues both developmental and non-developmental goals simultaneously and often in the same space.

Furthermore, I use the term “non-developmental” with neither a negative nor a positive connotation. Scholarship on the developmental state tends to classify as non-developmental states those that “do not perform nearly as well in terms of developmental criteria” (Leftwich, 1998, p. 53). On that usage, a non-developmental state impedes development rather than promoting it, thus depriving citizens of a presumptive good. A non-developmental state is thus a failed developmental state, or a “predatory” state (Evans, 1995). In my dissertation, by contrast, the idea of non-development does not
convey this negative meaning: it simply indicates the absence of a fundamental commitment to the active promotion of economic development.

In addition, the idea of non-development should not be taken to imply active or radical opposition to economic development. Here, a distinction between non-development and post-development is instructive. Post-development indicates ideas or actions in active opposition to, or somehow residing beyond the frontiers of, economic development (Escobar, 1994, 2017). By contrast, the idea of “non-development” allows us to distinguish a lack of a fundamental commitment to the advancement of development from post-developmental antagonism to it. The distinction is particularly important given the difficulty of identifying clear sectoral agendas of the state that strongly oppose development. The state rarely embraces such agendas, but rather exhibits a strong commitment to the active promotion of capitalism (M. Weber, 1968) and modernity (Scott, 1998).

In sum, the four sectoral agendas of the state, their characteristic land-use planning institutions, and the two development-oriented faces of the state are naturally abstract constructs. Reality is more complex and dynamic than Table 2.1 suggests. My goal here is simply to provide a parsimonious conceptual map through which to understand the scope of the state in the Amazon. State scope, in turn, is an antecedent dimension of STR, state strength, and the politics of enforcement.

---

63 Since non-development does not always oppose development, the concept covers more but says less about the phenomenon of interest (Sartori, 1970).
2.4. Green is the New Brown

The previous section provided a conceptual apparatus for understanding the institutional antecedents of both subnational state strength and the politics of law enforcement. I posited a distinction between STR and state scope because states not only pursue different and non-always-coherent goals (scope) but also exhibit different types of presence (reach). This section goes one step further to analyze the relationship between uneven stateness and the ecological characteristics of territories that have traditionally been depicted as “brown.”

2.4.1. States Have Many Brown Zones

States in the developing world are rarely able to govern their peripheries evenly, and Guillermo O’Donnell (1993, p. 140)’s classical characterization of ungoverned areas as “brown zones” is a simple and useful way to think about them. How can brown zones be identified? Does the literature provide tools with which to identify them? Comparative scholarship emphasizes at least three aspects of brown zones, all of which pertain to the underlying mismatch between people and territory. First, the literature stresses the difference between urban and rural areas, suggesting that state reach in developing countries often has an “urban bias.” The state is “relatively ineffective at penetrating peasant agriculture” (Mann, 1984, p. 124). Second, the literature suggests that internal

---

64 Comparative scholars have noted that, historically, controlling the countryside was one of the major challenges of state building (Spruyt, 1994; Tilly, 1992).
65 Economists and political scientists have long recognized that state decisions and investments tend to favor urban areas to the detriment of rural populations, which already perform poorly on most development indicators. See Lipton (1977), Bates (1981) and Bezemer & Derek (2008) on the economic and political dynamics of the urban bias. See, e.g., Weber’s classic Peasants into Frenchmen (1976) on the difficulties of asserting state control over the countryside.
frontiers tend to be difficult to govern and that public goods provision and access to basic infrastructure is often low in frontier zones (Foa & Nemirovskaya, 2016; LeGrand, 1986). Finally, scholars note the importance of commercial agriculture in explaining why and where particular institution-building strategies are implemented (Boone, 2003).

The existing scholarship thus takes stock of subnational geographic differences in the infrastructural power of the state, and offers a set of analytical tools for identifying likely brown zones. State strength tends to decrease in rural areas and, even more, in both frontier zones or areas without commercial agriculture. These three factors alone help explain why the Amazon has low levels of state strength: it is a mostly rural frontier region in which the vast majority of the territory has not undergone commercial agricultural development.

2.4.2. Brown Zones Resulting from Varied Ecologies

Despite its important contributions, the literature on subnational stateness tends to assume that the countryside, peripheries, and frontier regions are homogeneous. Classic studies of the state rarely take into consideration the variable ecological characteristics of the territory. Brown zones like the Amazon, which accounts for roughly 40% of South America, are barely mentioned in the scholarship on state formation in Latin America (Centeno, 2002; Kurtz, 2013; López-Alves, 2000; Soifer, 2015).

There are some noteworthy exceptions to the general trend of neglecting ecological characteristics, however. Scholars have recognized that certain territories are difficult to reach, making the “logistics of political control” difficult to implement. In this
sense, there may be territories that, given their ecological characteristics, are naturally resistant to state action. What makes these territories so resistant? Do their ecological or topographical characteristics really explain such difficulties? How much can we infer about the state from the ecosystems in question?

Comparative scholarship identifies certain ecological characteristics thought to make political control difficult. Studies on the causes of violence tend to converge on the idea that a “rough” terrain helps explain both the onset and the continuity of conflict. Rough terrain heightens the risk of violence because it aids “rebels in hiding from superior government forces” (Fearon & Laitin, 2003, p. 76). It is no coincidence that many classic theorists of guerrilla warfare recognize the strategic value of particular territories. For example, Che Guevara (1998, p. 29) argued that guerrillas perform better “in zones difficult to reach, either because of dense forests, steep mountains, impassable deserts or marshes”. Similarly, Mao Tse-tung (2015) observed that a successful guerrilla “travels light and travels fast. He turns the hazards of terrain to his advantage and makes an ally of tropical rains, heavy snow, intense heat and freezing cold” (p. 26). These writers tend to be aware of the existence of geographic obstacles that limit state power (Tollefsen & Buhaug, 2015, p.11). Rough terrain, in other words, helps create brown zones.

---

66 Tse-tung was convinced that guerrilla camps should be located in the mountains, where they could successfully hide from the regular army.
Additionally, the academic literature tends to agree that mountainous terrain, deserts, and forests are difficult to control (e.g., Giraudy & Luna, 2017, p. 105). For example, the proportion of a country that is mountainous has been used as a cross-national measurement for rough terrain (Fearon & Laitin, 2003, p. 81). Similarly, Herbst (2000)’s *States and Power in Africa* emphasizes the difficulties of governing the forested or desertic hinterlands of many African countries. Finally, Eartman’s *Birth of the Leviathan* explains that, historically, in Poland “vast areas of thick forest and marshland … prevented the construction of large-scale forms of social and political organization” (1997, p. 278). Mountains, deserts, and forests have thus all been represented as environments that tend to resist the effective exercise of state authority.

What do these landscapes have in common that makes them resistant to state authority? Comparative scholarship suggests the answer may have something to do with the way mountains, deserts, and forests restrict population settlement and economic development. Put differently: the effect of different ecosystems on state power is mediated by population dynamics. For example, in Africa, vast territories remain beyond the reach of the state due to low population density, which makes state building both costly and unrewarding for political elites (Herbst, 2000). James Scott’s conclusions in *The Art of Not Being Governed* (2009) do not radically differ from what Herbst argues:

---

67 Tollefsen and Buhaug (2015, p. 17) found that the number of battles increases with distance from the capital city, the prevalence of mountains and forests, and the size of excluded populations.

68 This crude measurement is, surprisingly, not very different from Scott (2009)’s qualitative study on the highlands of Southeast Asia. Scott studies the Southeast Asian mountain region “on the marches of mainland Southeast Asia, China, India and Bangladesh” (2009, p. 14), which, according to him, may be one of the largest “non-state spaces” on Earth.
namely, that state authority tends to vanish in certain territories because state power is “man power.” 69

All of the above suggests that the densely forested green zones of the Amazon are, in fact, what O’Donnell (1993) calls brown zones: green is the new brown. Since O’Donnell did not consider the interaction between the state and nature, the colors of his maps are very different from mine. Many of the brown zones of Peru and Brazil, the Latin American countries that O’Donnell studied, are green, ecologically speaking, since they are mostly covered by natural forests. STR is low in the dense forests of the Amazon, but high in lands that have been cleared. Amazonia is a continental brown zone spanning several peripheral states (Ungar, 2018) 70 that face the not-insignificant challenge of exerting power over a region that has become crucial for the world economy and environment.

Figure 2.3 provides a simple but powerful image to illustrate this point. It depicts contemporary forest cover in Colombia and its spatial association with the most important system of indirect rule that the Colombian state implemented until the end of the twentieth century. The Catholic church was in charge of performing most state functions in many parts of the country, and the Amazon was one of them. Therefore, the

69 Mountains do not always resist state action, which depends on particular historical configurations. While state power diminishes with altitude in Southeast Asia (Scott, 2009), power and wealth are concentrated in the Andean mountain range in countries like Colombia, Peru, Ecuador and Bolivia. States were built where manpower was present, thus reinforcing spatial patterns that existed from pre-colonial times (Mahoney 2010). The capital of the Inca Empire was located in Cusco rather than Lima and the suyos (regional territorial power structures) were designed to connect Andean towns. Thus, state strength diminishes in the lowlands of most Andean countries, a fact that the Amazon exemplifies.

70 This region is, so to speak, a doubly peripheral region because it comprises the periphery of a group of peripheral states (Cardoso & Faletto, 1979).
map is useful to highlight that forest areas tend to be brown, which in this case is represented by state delegation to the Catholic Church.

Figure 2.3. Forest cover and indirect rule in Colombia

Data for indirect rule from Bonilla (1968) and for forest cover in 2012 from IGAC-SIGOT (coauthored with Nicolás Herrera).

In conclusion, the existing scholarship provides useful theoretical tools for identifying the places where state strength decreases: peripheries, rural areas, internal frontiers, and areas without commercial agriculture. The literature also concludes that
mountains, deserts, and dense forests tend to be brown zones due to the mismatch between population and territory. The Amazon should be understood as a brown zone because it meets all of these expectations.

2.4.3. Amazonia: A Brown Zone that Could Be Modified

Political science literature on the state’s territorial unevenness tends to assume some sort of geographical determinism: the Amazon is a brown zone because it is green. However, as discussed in Chapter 1, my dissertation adopts a different perspective, one that investigates how landscapes are socially constructed and, in so doing, critiques contemporary forms of geographical determinism with a view towards the particular ecological characteristics of different brown zones.

Taking account of the differences between ecosystems reveals that tropical rainforests unlike ecosystems like deserts and steep mountains can be configured, unmade, and remade. Dense forests like the Amazon are susceptible to transformation by different combinations of technology, capital, and labor. Given the changing nature of tropical rainforests, they should not be treated as constants or independent variables. This idea may strike environmental studies scholars as self-evident, but political scientists have yet to reckon with it (see Chapter 1).

It is certainly true that dense forests, deserts, and steep mountains are all peripheries of the state, and as such can be classified as brown zones. It is also true that population density tends to be low, capitalist development limited, and state control
contested in these regions. However, unlike deserts and steep mountains, demographic change and economic development is more dynamic in the Amazon because the ecology of the forest is less resistant to human settlement. Within certain constrains, settlement in the Amazon is not only possible but positively incentivized by the region’s wealth of natural resources. The costs of transforming forests are comparatively low, and forests provide crucial inputs that other ecosystems do not (Peluso, 1994; United Nations, 1996). Given its natural bounty and soil quality, the Amazon can be rendered suitable for food production and farming under the right conditions.

In other words, the Amazon’s status as a resource-rich brown zone partially explains its relative dynamism. Demographic variables in the Amazon cannot not be treated as constants in the same way that, e.g., Herbst (2000) regards geographic and demographic patterns in the hinterlands of Chad, Mali, Mauritania, and Niger as quasi-permanent features. In those countries, “greater urbanization only will enhance the importance of the capital city because it is unlikely that people will migrate anywhere else” (Herbst, 2000, p. 154). Herbst’s conclusion is grounded in the reality that the peripheries in question are comprised of the Sahara Desert, a resource-poor terrain that significantly constrains the development of animal and human life. Unlike the Sahara, the Amazon is a resource-rich region that supplies settlers with water, food (fish, mammals, 71 Naturally, the logistics of political control depends on the interaction between the ecological characteristics of the terrain and available technologies. For example, the impact of tropical diseases such as malaria or dengue can now be controlled thanks to modern medicine (which was less developed when European colonialism first arrived) (Acemoglu, Johnson, & Robinson, 2001); road construction has become easier (Little, 2014); and helicopters can quickly reach previously isolated regions (Rojas, 2015; Scott, 2009). Furthermore, increased state control through the direct transformation of the landscape is always a possibility. The use of Agent Orange by the U.S. military is perhaps the clearest example. The powerful herbicide and defoliant was sprayed over forests and the countryside during the Vietnam war in order to remove both the hiding places and food crops that sustained rural populations and guerrilla groups.}
birds), building materials, and firewood (Brucher, 1974). Furthermore, the commercial value of the Amazon’s resources (for example, rubber, timber, and skins) incentivized previous migration waves. Therefore, when the ecological characteristics of different brown zones are compared, it quickly becomes evident that the bio-diverse Amazonian terrain is not as hostile as one might initially surmise (Dominguez Ossa & Gómez, 1990).

Furthermore, while the Amazon’s soil quality does not prevent migration, it does constrain it. James Scott (2009) notes that soil quality is a crucial factor constraining or incentivizing the development of commercial agriculture. Amazon soils are acidic and lack many of the nutrients that commercial agriculture requires. Compared to the desert, however, Amazonian soil is both higher quality and more proximate to water. Diamond (1999)’s theory of food production as the driving force behind civilizational expansion usefully illustrates this point. Agriculture, he explains, is extremely difficult in deserts and the Artic, whereas Amazonian soils are at least to some degree amenable to food production (Diamond, 1999, p. 250). Albeit costly to develop, farming in the Amazon is possible. The arid soil of the desert, by contrast, imposes qualitatively different constraints on food production.

---

72 The rapid urbanization of some Amazonian cities is the clearest example of this dynamism (Little, 2014, p. 62).
73 Although food production techniques have gradually evolved in the Amazon, many areas remain beyond the reach of agricultural development and are naturally protected. Hunter-gatherers have been able to persist in their traditional economic activities “only where especially potent geographic or ecological barriers made immigration of food producers or diffusion of locally appropriate food-producing techniques very difficult” (Diamond, 1999, p. 250).
74 To be clear, I am not suggesting that agriculture is completely impossible in desert regions. There are many examples of desert farming in countries like Israel, Australia, and the United States (Fedoroff et al., 2010). My point is simply that, when we compare deserts with tropical rainforests, food production appears far less complicated in the latter.
In conclusion, Amazonia, the biggest tropical rainforest in the world, can be characterized as a transnational brown zone where both state reach and strength tend to be relatively low. Taking account of the basic ecological characteristics of different peripheral territories, I argue that the Amazon is comparatively more amenable to human transformation than other brown zones. Like mountains and deserts, dense forests tend to resist state control. The latter, however, can be modified with some effort. It is for this reason that the study of Amazon deforestation has the potential to disrupt political science’s geographical determinism (see Chapter 1).

2.5. Conclusion

The relationship between Amazon deforestation and STR is complex, and the purpose of this chapter was to lay out the conceptual foundations of my dissertation. Advancing an interdisciplinary dialogue, I clarified what tropical deforestation is and identified its underlying causes, with a particular focus on the role of politics. Existing academic literature on tropical deforestation, I argue, is largely preoccupied with proximate drivers to the detriment of underlying socio-political explanations. I then unpacked the subnational dimensions of stateness with the aim of highlighting the limitations of the “enforcement paradigm” (that is, research focused on the effective implementation of anti-deforestation laws). I defended the importance of taking several steps back—from enforcement to strength; from strength to reach; and from reach to scope—in order to bring into view historically prior research questions about subnational stateness and deforestation.
Finally, I argued that it is necessary to consider the basic ecological characteristics of a state’s peripheries in order to determine how amenable they are to human transformation. The academic literature on the subnational strength of the state already maintains that forest lands tend to resist state action—i.e., that green is the new brown. However, this chapter suggests that geography is not destiny. Forest lands can be transformed, unmade, and remade. The next chapter employs the concepts we have developed here to further explore the mechanics of deforestation and the role of the state therein.
CHAPTER 3. A THEORETICAL PROPOSAL ON THE STATE AND AMAZON DEFORESTATION

“Human transformation of the environment at one historical moment thus establishes limits to the subsequent uses which man can make of his environment.” Stephen Bunker (1985, p. 14)

3.1. Introduction

Chapter 2 reviewed the literature on the drivers of tropical deforestation, with particular attention to the role of politics at the subnational level. It also described the institutional and ecological context of State Territorial Reach (STR) and argued that the Amazon, as the world’s largest tropical rainforest, can be characterized as what Guillermo O’Donnell (1993) called a “brown zone.” Because the logistics of political control are difficult to implement in densely forested areas, the Amazon can be characterized as state resistant (Scott, 2009). However, unlike certain other ecosystems, rainforests lend themselves to transformation through human effort and capital investment. Despite the relatively poor quality of Amazonian soil, tropical rainforests possess an abundance of natural resources that deserts and mountains do not (Peluso, 1994; United Nations, 1996).

Building on these concepts, the current chapter goes a step further and proposes an empirically-grounded and politically-oriented explanation for varying levels of cumulative deforestation in the Colombian Amazon. By studying the factors that make Amazonia a “brown zone,” I theorize the relationship between territorial integration and deforestation. This chapter presents the core theoretical contributions of the dissertation and generates a relatively parsimonious set of hypotheses through a combination of
deductive and inductive reasoning. My overarching claim is that different levels of cumulative Amazon deforestation in Colombia are the product of enduring trajectories of economic and political integration. In particular, I argue that any explanation of cumulative deforestation must consider both the *degree* and *type* of territorial integration. Below, I provide a brief overview of my theory of deforestation, characterize the various degrees and types of integration, and conclude by discussing my research design and methodological approach.

3.2. An Overview: Deforestation and Integration

Despite the difficulty of unpacking the relationship between territorial integration and deforestation, I propose that a comprehensive explanation of cumulative deforestation in the Colombian Amazon needs to seriously consider both the *degree* and *type* of integration. Figure 3.1 is a schematic representation of the argument I develop in subsequent sections of this chapter, and in the remainder of the dissertation. Briefly, while the level of agrarian colonization determines the *degree* of territorial integration, the different sectoral agendas of the state (see Chapter 2) determine the *type* of integration. The combination of degree and type, in turn, determines the ultimate level of cumulative deforestation.
Economic and political integration tends to increase with the spatial advancement of agrarian colonization, which promotes deforestation in the short run. The expansion of agriculture is one of the main proximate drivers of tropical deforestation in South America (Armenteras & Rodríguez, 2014). Densely forested areas tend to be “brown” because they have not yet been subject to agrarian colonization, which has traditionally driven both deforestation and the expansion of STR. Once we establish the degree of integration (via colonization), however, we must then consider the various social engineering strategies through which forest peripheries were integrated into the state (Scott, 1998, p. 4). Variation in the rate of cumulative deforestation between regions with active agricultural frontiers, I argue, is a product of the particular type of territorial integration. In other words, the distinctive, state-led development strategies applied to different Amazonian provinces during the development era shaped their overall integration and, thus, their present levels of cumulative deforestation.
This combination of degree and type of territorial integration determines the ultimate level of cumulative deforestation, which I classify as either high, medium, or low. Cumulative deforestation tends to be low in regions where agrarian colonization is uncommon and the frontier is relatively inactive. By contrast, deforestation is highest where agrarian colonization is most advanced and where the developmental-era state promoted an integration pathway geared towards commercial farming. The combination of agrarian colonization and heavy state intervention enabled these regions to transition from subsistence to commercial agriculture, and thereby to promote rapid cumulative deforestation. Finally, between these two extremes, cumulative deforestation is moderate where agrarian colonization occurred but the state did not promote a developmental-era integration trajectory based on commercial agriculture.

Historically, I propose that cumulative deforestation and territorial integration tend to be high in provinces like Caquetá and Putumayo, which transitioned from extractive economies quinine and rubber to agrarian colonization after the 1932 Colombian-Peruvian war. Among these active agricultural frontiers, cumulative deforestation in Caquetá (compared to Putumayo) tends to be much higher because, during the developmental era, the state first and then the market succeeded in establishing an integration trajectory that is based on livestock farming (see Figure 1.2). The next two sections of this chapter provide some of the additional analytical tools we need to make better sense of these categories and the broader relationship between Amazon deforestation and territorial integration.
3.3. Integration as an Underlying Driver of Amazon Deforestation

3.3.1. Understanding the Amazon’s Brownness

This section develops the idea that cumulative deforestation in the Amazon is, in the first place, the result of different degrees of territorial integration. I have argued thus far that dense forests like the Amazon tend to be “brown zones,” and that, unlike other ecosystems, tropical rainforests can be transformed by introducing capital, labor, and technology (see Chapter 2). Just as highly integrated parts of the Amazon tend to have already been stripped of heavy forest cover, new deforestation tends to occur in regions the state has barely penetrated. If forests tend to be “brown” and cultivated areas “blue” or “green,” to use O’Donnell (1993)’s terminology, one might suggest the hypothesis that territorial integration is an underlying driver of deforestation. In other words, integrating forested brown zones into the state may contribute to their deforestation.

However, the apparent positive relationship between territorial integration and deforestation could be a spurious one so long as we are unable to identify the mechanisms by which political and economic integration are linked to the clearance of land, and vice versa. Hence, a vital task of this dissertation is to study the precise relationship between territorial integration and Amazon deforestation. While I do not present a complete literature review on the political ecology of the modern state (Blaikie, 1987; Forsyth, 2003), I do offer some theoretical insights that may enhance our understanding of the relationship between STR and deforestation.
In Chapter 2, I reviewed the scholarly consensus that cumulative deforestation tends to result from, *inter alia*, infrastructure extension, agriculture expansion, wood extraction, economic development, and population changes (Armenteras, Rudas, Rodriguez, Sua, & Romero, 2006; Geist & Lambin, 2002; Rudel, Defries, Asner, & Laurance, 2009). Interestingly, the classic literature on the social origins of the modern state contends that most of these variables also contribute to state development. If road building (Guldi, 2012; Herbst, 2000), commercial agriculture (Boone, 2003), population density (Scott, 2009), and taxation (Levi, 1981; North, 1990) are critical variables influencing both STR and deforestation, then we have good theoretical reason to posit a close relationship between the two phenomena.

How is this relationship best characterized? For an answer that is both parsimonious and appropriately nuanced, we must examine the social origins of the modern state. I suggest that deforestation and STR are closely related because both phenomena are caused by agrarian colonization. The co-occurrence of STR and Amazon deforestation is explained by the sustained advancement of agrarian colonization in the twentieth century, which promoted deforestation in the short run and territorial integration in the long run. Conversely, dense forests tend to be brown because they remain beyond the reach of agrarian colonization. Figure 3.2 summarizes the argument, which I will explore step by step.
3.3.2. The Short-term Effect: Agrarian Colonization as Creative Destruction

The first element in Figure 3.2 depicts the environmental consequences of agrarian colonization. The massive incorporation of new land by small, medium, and large farmers has historically been the main driver of deforestation in the Amazon region and South America writ large (Armenteras & Rodríguez, 2014; Busch & Ferretti-Gallon, 2017; Etter, McAlpine, Phinn, Pullar, & Possingham, 2006; Geist & Lambin, 2002). On this basis, I propose that agrarian colonization be conceived as part of a larger process of “creative destruction” (Schumpeter, 2008) in which forests are destroyed and both agriculture and territorial integration are created.

I begin with a discussion of the meanings of relevant terms. “The etymological origins of Latin words colonia (agricultural settlement), colonnus (farmer) and colere (cultivation) show how foundational agrarian labour is to the word colony” (Arneil, 2017, p. 20). Colonos (in Spanish), then, are defined by their economic activities, which in the Amazon are characterized by the opening and incorporation of new forestlands along the
agricultural frontier. The large-scale entrance of colonos and investors into forested areas has traditionally been accompanied by a radical change in the use of land.

Chapter 2 showed that many economic models of tropical deforestation conceive the relationship between forests and agricultural lands as a zero-sum game: areas that are covered by forests are not cultivated, and cultivated areas are not covered by forests (Angelsen & Kaimowitz, 1999), implying that the opportunity cost of maintaining the forest is restricting the advance of agriculture.73 Until very recently, official records classified forest lands as uncultivated (incultas), uncivilized (incivilizadas), or simply “to be colonized” (colonizable).

The relationship between colonos and the forest is mediated by two types of labor: hunter-gathering and farming (Cronon, 1995). Forestlands tend to be perceived at the local level as economically worthless in and of themselves. It is only as a result of the colono’s labor—an arduous labor in humid tropical conditions, I might add—that economic value is created.74 Farms are born out of labor; land is improved by clearing. In fact, during my fieldwork in the Amazonian piedmont, I learned that the word deforestation is not commonly employed by colonos, who prefer the idea of “mountain toppling” (tumbar monte). While contemporary environmentalists emphasize destruction over creation, colonos tend to highlight creation over destruction.

---

73 There is an interesting debate about the environmental impact of peasant agriculture. Some argue that peasants have the capacity to engage in sustainable practices and that references to their destructive role only reinforce a discourse that discriminates against and stigmatizes them (Ojeda & González, 2018). Although the risk of discriminatory policies exists, based on my own fieldwork, it appears indisputable that colonos are the primary driving force behind the transformation of the landscape that we call deforestation.

74 The clearance of new land was even more difficult and time consuming when modern chainsaws were not available. Hence, technological improvements can impact cumulative deforestation (Geist & Lambin, 2002).
Both positive and negative aspects, however, are part of the same process of creative destruction that characterizes agrarian colonization. Colonization is not a uniform phenomenon, of course. Colombian scholarship posits the existence of numerous types of colonization depending on whether the process is led by peasants (*colonización campesina*), ranchers (*colonización ganadera*), coca growers (*colonización cocalera*), indigenous peoples (*colonización indígena*), corporations (*colonización empresarial*), the army (*colonización militar*) or guerrillas (*colonización armada*).75

Until the 1980s, just decades ago, few people in the Amazon conceived agrarian colonization as anything other than a righteous war on nature, valiantly waged by the *colonos* with their axes and bodies. As such, thousands of farms have been established in the course of colonization, accompanied by the construction of agricultural settlements and basic infrastructures. That same infrastructure, incidentally, supports the logistics of state control (Mann, 1984; Scott, 2009). Some agricultural settlements have even become towns and proper cities over time. Unsurprisingly, land prices tend to increase the closer a farm is to agricultural settlements and roads, as well as when farmers possess a formal land title and have cleared the forest. This explains why lands closest to sources of wealth and authority tend to be deforested.

If agrarian colonization had occurred only once, deforestation would have ceased long ago. The problem, however, is that colonization tends to recur indefinitely due to factors like land accumulation, the sustained advancement of commercial agriculture,

75 See Molano (1980), Jaramillo et al (1989) and Salgado (2012) on the differences between these types of colonization.
demographic increase, and the concrete economic and political difficulties that colonos face in attempting to remain in their original places of settlement.\textsuperscript{76} As Colons sell the fruits of their labor, the land market, which is initially informal (De Soto, 2000), slowly consolidates.

Because some colonos move away in order to repeat the process, colonization tends to exhibit particular spatial patterns (Bunker, 1985; Mertens & Lambin, 1997). What others have done in the past tends to influence the location and the economic decisions of newcomers. Since colonos and investors already control the best lands, newcomers have strong incentives to move further away from the agricultural frontier, where land is still “free” or cheap (Serje, 2011). When that happens, newcomers must confront nature anew, as they (or others) did when they were younger.\textsuperscript{77}

Conceived as a form of creative destruction, agrarian colonization (or the absence thereof) is thus the first factor we must account for in understanding why densely forested areas like the Amazon tend to be “brown.” In the short term, colonos and investors clear the land, establish a farm, and transform the landscape. By introducing the social conditions that promote deforestation, agrarian colonization facilitates the integration of forest peripheries.\textsuperscript{78}

\textsuperscript{76} A local politician I interviewed described the process as a modern version of the Myth of Sisyphus: a punishment that colonos suffer and which they must eternally repeat (interview 6).

\textsuperscript{77} Agrarian colonization can also understood with reference to established and outsider actors (Elias, 2008). Established colonos and investors acquire cleared land. Some of the established were once outsiders and most outsiders aspire to be part of the establishment. However, while the colonization process tends to repeat itself, the same people are not usually involved.

\textsuperscript{78} Recognizing the vital role of agrarian colonization does not mean that colonos are the only relevant actor in the transformation of the landscape, which is also influenced by investors, coca growers, hunters, loggers, miners, merchants, companies, and indigenous peoples.
3.3.3. The Long-term Effect: State Embeddedness in Agrarian Colonization

A second key to understanding why forests are brown zones is recognizing that states usually embed themselves in agrarian colonization, that is, in territories that have been previously colonized (see Figure 3.2 above). Comparative scholarship finds that states are typically enmeshed in concrete social relations and networks of power (Mann, 1986; Migdal, 2001). Embeddedness is the concept that political economists have used to characterize these strong connections. Karl Polanyi (2001), for example, suggested that markets in capitalist societies tends to be socially “embedded,” despite sustained efforts to disembend them. A similar concept informed Peter Evans (1995)’s classic notion of “embedded autonomy,” which holds that economic development is the product of an autonomous state that is nonetheless closely embedded with civil society.

Due to the state’s embeddedness in agrarian colonization, the territorial integration of forested areas is strongly associated with deforestation. By studying the way in which the agricultural frontier advances, we can understand the particular characteristics of territorial integration that explain cumulative deforestation in the Amazon. Major landscape transformations are the hallmark of an advancing agricultural frontier, which in turn constitutes a necessary but insufficient condition for the long-term extension of STR (Boone, 2003). James Scott (1998, p. 11) described that the study of forests and their transformation as a “metaphor” for the “manipulation characteristic of

---

79 For example, it has been claimed that state development is conditioned by social processes like economic development (Polanyi, 2001; M. Weber, 1968) or modernization (S. Huntington, 1968; Migdal, 1988; Scott, 1998).
powerful institutions with sharply defined interests, of which state bureaucracies and large commercial firms are perhaps the outstanding examples.”

The positive relationship between territorial integration and deforestation is so strong that we can invoke the logic of necessary but insufficient conditions (Braumoeller & Goertz, 2000): deforestation in the Amazon has been a necessary but insufficient condition of STR. How do we know when a condition is truly necessary? According to Braumoeller and Goertz, deforestation is only a necessary condition of STR if two premises are satisfied: (1) territorial integration is limited where massive deforestation has not happened, and (2) massive deforestation is always present where there is high territorial integration. I leave it to the reader to judge if Chapters 4, 5, and 6 provide enough evidence to support this claim.80

At this point, however, I would like to provide some introductory evidence to illustrate how agrarian colonization has promoted deforestation in the short run and territorial integration in the long run during the twentieth century. Figure 3.3 illustrates that road networks, access to electricity and centers of population in the Amazon, all of favor the state’s logistics of control, are concentrated where forests were previously cleared. Similarly, most of the same factors are absent in densely forested areas. The figure also illustrates a similar relationship between deforestation and political integration, which is here represented by the difference between areas that have been

---

80 It is important to recognize that not every deforested area has penetrating forms of STR (see Chapter 2). This fact does not present a logical problem for the argument, as deforestation may be a necessary but not sufficient condition of territorial integration.
formally recognized as municipalities and areas that have not.\textsuperscript{81} The figure provides a visual image of the fact that forests cover, on average, 50% of municipalities, while the 94% of non-municipalized areas are covered by forests.

\textbf{Figure 3.3.} Cumulative deforestation and economic and political integration in the Colombian Amazon.

Data for centers of population and political-administrative boundaries from the DANE (2017), for roads and rivers from the IGAC (2017), for Nighttime Lights from MODIS (2018), for forest cover from the IDEAM (2016), and for the Amazon region from the SINCHI (2017) (coauthored with Nicolás Herrera).

But this aggregate and general picture is the outcome of a complex historical process. Figure 3.4 presents the relationship between cumulative deforestation and the formal recognition of a municipality. This figure focuses on the Amazon piedmont,

\textsuperscript{81} In theory, every part of the Colombian territory should be part of a municipality. However, there are several territories in the Amazon region that are not part of a municipality and have not been recognized as such.
where most deforestation has occurred and most municipalities have been recognized. Not a single municipality had been recognized and the region was mostly covered by forests when the twentieth century begun (A. Ciro, 2008). However, after one century, 29 municipalities had been recognized and slightly less than 3 million hectares of forest had been lost. To illustrate this process, Figure 3.4 presents cumulative deforestation and classifies the recognition of new municipalities by decade since the early 1970s.
Figure 3.4. Cumulative deforestation and political integration over time in the Amazonian piedmont Data for political-administrative boundaries and its timing from the DANE (2018) and for forest cover my own data (coauthored with Nicolás Herrera).
My emphasis on state embeddedness carries an important implication: the state, which is usually defined by its means rather than its ends, may not always be neutral with respect to environmental outcomes like Amazon deforestation. The “enforcement paradigm” as applied to deforestation not only tends to assume a virtuous cycle between state strength and environmental protection but also frequently relies on a procedural conception of the state that imagines it as fully disembedded.\textsuperscript{82} State strength tends to be defined in terms of the ability to achieve policy objectives, and the enforcement paradigm assumes that environmental objectives are no different. Yet, when state embeddedness is taken seriously, we are forced to conclude that the modern state is not always neutral with respect to deforestation since state reach has historically been associated with the very drivers of deforestation (e.g., population, infrastructure, commercial agriculture, and private property).

Agrarian colonization is thus part of the social origins of STR and helps us understand the relationship between deforestation and the state. Population settlement and agriculture tend to precede the economic and political integration of territory. Less populated areas have relatively low STR, and even less if commercial agriculture is absent (Boone, 2003; Herbst, 2000; Scott, 2009). The idea that states follow population movement and capital development is not new (Lange & Rueschemeyer, 2005; Scott, 1998). The main theoretical contribution of this dissertation is to conceptualize the particular relationship between the state and the forest in the Colombian Amazon by being explicit about these linkages.

\textsuperscript{82} Chapters 1 and 2 summarized what I mean by the “enforcement paradigm.”
Agrarian colonization can be seen as part of the “organic process of state development,” an idea proposed by Miguel Centeno (2002) to differentiate the European process of state development from the same process elsewhere. On this view, European states underwent an organic developmental trajectory that allowed them to “grow into” their frontiers. Because Latin American states like Colombia did not face strong external threats, their state-building strategies mostly focused on places where the population was settled. “The sheer amassing and control of territory was not as central for Latin America as it was for Europe” (Centeno, 2002, p. 270). As a result, juridical sovereignty and state territoriality does not always coincide with the de facto exercise of power in developing countries like Colombia (e.g., Jackson & Rosberg, 1982; Herbst, 2000).

The existence of brown zones like the Amazon is partly the result of this mismatch between population and territory.83 The literature suggests that sparsely populated regions tend to be difficult to govern because state leaders lack the incentives to broadcast power (Herbst, 2000). State power is basically man-power, which means that states are usually anchored in places where population is settled (Scott, 2009).84 It is thus vital to consider population numbers when studying STR.

Although theories that emphasize the relationship between state power and population are useful in explaining the state’s limited reach in tropical rainforests like the Amazon, they tend to assume that demography remains the same over time. By contrast, I

---

83 Border disputes in the Colombian Amazon were settled by the mid-1930s as a result of the Colombian-Peruvian war (see Chapter 4).
84 The territorial state has historically been an anthropocentric political form. Unsurprisingly, it has many weaknesses when it comes to addressing the so-called “ecological challenge” of our times (Dobson & Eckersley, 2006).
propose that, instead of reproducing the well-known methodological practice of holding population constant in the study of political phenomena like STR (Giraudy & Luna, 2017; Steinberg, 2018, p. 238), any research project on the enduring connection between territorial integration and deforestation needs to seriously consider demographic change. By controlling for population dynamics, studies risk losing sight of the fact that state power is man-power (Herbst, 2000; Scott, 2009). Contemporary studies on the politics of territorial unevenness (Boone, 2012; Giraudy & Luna, 2017; Steinberg, 2018) stand to benefit enormously from considering not only how territories are populated over time (González, Bolívar, & Vásquez, 2002) but also how particular regions gain in strategic importance as population dynamics change.

The significance of population is more complex than numbers alone. In addition, the literature notes that state control becomes easier when populations are settled, that is, when they are not mobile (Scott, 2009). Unsurprisingly, states with open internal frontiers like the Amazon tend to have serious problems of consolidation because people can easily evade state control. Ernest Gellner famously wrote:

Pastoral societies, especially (but not exclusively) when nomadic, provide a milieu within which centralization of power, though not unknown, tends, when it does occur, to be short-lived, ephemeral, and to lead, after a fairly short time, to a return to the initial, uncentralized situation. The explanation is not far to seek: though pastoral societies possess storable wealth, it is mobile wealth, and those who own it may escape the dilemma of the pre-emptive conflict… Something similar is true of peasant societies in difficult terrain. Generally speaking, peasants are tied to their fields and therefore eminently exploitable: they cannot run away. Nevertheless, if their fields are located in terrain that is difficult of access, then the imposition of domination may be too arduous to be worthwhile (1988, p. 149).
State territorial reach, then, is closely associated with populations that are already established and that live in areas that are not difficult to access. The modern state is thus a form of political organization that mainly exercises power over settled territory (Lustick, 1993), and the Amazon region is no exception. This linkage is so clear that, historically, authorities in the Colombian Amazon have consciously attempted to settle nomadic groups and have introduced incentives to facilitate the internal migration of populations amenable to proper agricultural settlement (Bonilla, 1968; Uribe, 2017). Since native indigenous groups in the Amazon have historically been nomadic while newcomers have been sedentary, state embeddedness clearly has a cultural angle.

The sustained arrival of *colonos* and investors who were socialized in settled societies as well as the steady cultural assimilation and displacement of native and nomadic populations is thus crucial to comprehending how the Amazon was integrated in the twentieth century. Since the late nineteenth century, and particularly from the middle of the twentieth century, the region has witnessed the rapid influx of newcomers from the most integrated parts of Colombia. Their basic economic and social practices were substantively different from those of the native populations. *Colonos* replicated in the Amazon region the economic practices of the most integrated parts of Colombia (CNMH, 2017). Agriculture was accordingly transformed from subsistence to commercial farming. The twentieth century was the period when both subsistence agriculture (initially) and commercial agriculture (subsequently) became widespread in the Amazonian foothills.

---

85 In fact, Scott’s initial insight (2009), as he recognized, was inspired by the longstanding indigenous practice of running away from predators in the Amazon.
Catherine Boone’s *Political Topographies of the African State* nicely underscores the connection between institution-building strategies and commercial agriculture. Boone contends that regions without commercial agriculture tend to remain politically unincorporated because state elites lack incentives to build institutions or challenge the power of rural elites. Non-incorporation, then, “is really a catch-all for rural societies that are not engaged in commercial agriculture” (2003, p. 323). Where commercial agriculture is underdeveloped, local elites exercise power and the regime abdicates authority. Although Boone’s theory relies on three explanatory variables, the existence of commercial agriculture is her baseline. Despite this powerful insight, I argue that Boone neglects the dynamism of state-society relations. Rulers’ strategies can change, and unincorporated regions can undergo different incorporation trajectories. Commercial agriculture does not simply exist: it is constantly in the making and, in the Amazon, leaves a footprint.

In conclusion, the state’s embeddedness in agrarian colonization is the second factor explaining why deforestation and territorial integration are closely related. Agrarian colonization promotes deforestation in the short run (creative destruction) and extends the territorial reach of the state in the long run (state embeddedness).

---

86 Boone proposes that, in the presence of commercial agriculture, institution-building strategies depend on the bargaining power and economic autonomy of rural elites. *Administrative occupation* is likely when rural elites lack bargaining power, whereas *usurpation* is likely when rural elites have substantial bargaining power but are not economically dependent on the state (powerful and highly autonomous rural elites need to be controlled). Finally, *powersharing* occurs when rural elites have substantial bargaining power and are economically dependent on the state. Dependent rural elites can be allies of the state even if they are powerful.
3.3.4. State Reach and Agrarian Colonization

In order to understand how agrarian colonization contributes to the extension of STR, it is first necessary to understand the role that state institutions play in colonization. The purpose of this section is to clarify how agrarian colonization is linked to political integration as well as economic integration. The literature has long addressed the role of the state in colonization and proposed different types of colonization: for example, state-led colonization, in which state agencies are responsible for the transplantation and welfare of colonos; induced colonization, in which state agencies do not directly support colonos but introduce strategic incentives for migration; and spontaneous colonization, in which colonos move without the active intervention of a state agency regardless of the posterior state support that they may receive.\(^87\)

These three ideal types illustrate the range of possible relationships between the state and colonization. The relationship that actually obtains, I hypothesize, will affect the magnitude and pace of colonization and corresponding deforestation. Given that states possess capacities and resources that colonos rarely have access to (Torres, 2011), and which enable them to promote cooperation for development (Lange & Rueschemeyer, 2005), I predict extensive and rapid agrarian colonization when state involvement is high. Scholars agree that, historically, induced and spontaneous colonization were more important in the Colombian Amazon than state-led colonization. Furthermore, state involvement was highest during the developmental era (1948-1982), a period when state-

\(^{87}\) See Salgado (2012) for a critical assessment of these types of colonization.
led colonization projects were implemented and spontaneous colonization was not led but supported by the state.\textsuperscript{88}

The belief that colonization in Colombia is largely spontaneous has been reinforced by the idea that Amazon deforestation is mostly unplanned (Armenteras et al., 2006). By contrast, my dissertation provides several tools for analyzing the role of the state in spontaneous colonization and deforestation. I propose that the Colombian state has always played a central role in colonization, and that my typology of STR (see Chapter 2) is useful for understanding how the state is never completely absent from unsettled lands. In short, the state provides the institutional framework and the imaginaries by virtue of which colonization occurs in the first place (Serje, 2011).

We can observe the role of agrarian colonization in promoting both economic and political integration by examining the relationship between land ownership and state territoriality. Legal geographer Nicholas Blomley (2017, p. 2) notes that “the tendency of geographers to tie territory to the state, combined with the resistance of most property scholars to engage with territory, means that there is little scholarship that focus on the territorial dimensions of property in land.” Blomley argues that property is territorialized and that such territorialization is one of the bases of state territory: the recognition of land ownership, in other words, decisively contributes to the institutionalization of state territory (Besley & Persson, 2009; De Soto, 2000).

\textsuperscript{88} The next section of this chapter describes the importance of this period in the Colombian Amazon.
As in many other countries, most forest areas in the Colombian Amazon were officially public lands (baldíos) until the early 1980s. Institutions and ideas associated with land acquisition, then, reached the region early and produced important effects even if they were not directly enforced by a state agency (Falleti, 2019). Formal institutions became consequential when colonos, who have historically been the vanguard of the state in the Amazon, began to occupy public forestlands. Colonos’ aspirations vis-à-vis baldíos are profoundly shaped by their own experiences as subjects of the state in their regions of origin. Colonos plant the seeds of the state and know what needs to be done in order to claim public land and increase the likelihood of obtaining a legal land title from the state (CNMH, 2017). One of those conditions is land clearance: the well-known mechanism of “clearing to claim” has long been at work in the Amazon, both formally and informally (Unruh, Cligget, & Hay, 2005). Figure 3.5 illustrates the amount of land titles that the Colombian state granted during the twentieth century in the Colombian Amazon by department.

---

89 Utilitarian property theorists would probably classify baldíos as commons because these areas belong to everyone and yet to no one. See Alexander & Peñalver (2012) for an introduction to Utilitarian Property Theory. It is important to highlight that, historically, baldíos were the most important formal institution in the Amazon region until the early 1980s. Designation as baldíos did not mean that territories were empty: indigenous people lived in the Amazonian foothills before the onset of agrarian colonization (A. Ciro, 2008; Serje, 2011).

90 The acquisition of baldíos is becoming increasingly difficult as a result of the recent recognition of national parks and indigenous reservations (see Chapter 6).
Historically, most deforestation has occurred in *baldíos*, which can be seen as reaffirming the “tragedy of the commons” (Hardin, 1968). After all, *baldíos* have been colonized by self-interested individuals who know that acquiring property depends on its use and occupation. This sustained appropriation of *baldíos* can also be conceived as a form of “enclosure” (Polanyi, 2001) or a tragedy of the commons led by the aspirants to private owners.\(^9\) The expansion of the land market as the result of agrarian colonization is a clear sign that territory is being institutionalized by the state. Furthermore, with the formal recognition of land property, *colonos* usually gain access to additional state services (De Soto, 2000).

\(^9\) *Colonos*’ aspirations are only sometimes fulfilled by state agencies as part of a slow-moving process that is neither peaceful nor mechanistic.
A summary of the argument thus far is the following: *colonos* move to forested areas, clear the land, establish a farm, finance a town, and facilitate both the economic and political integration of the territory. Densely forested areas tend to be brown zones because one rarely finds (1) penetrating forms of state reach without agrarian colonization or (2) agrarian colonization without deforestation.

3.3.5. Territorial Integration through Non-Developmental Agendas

Above I argued that the *degree* of territorial integration accounts for differences in cumulative deforestation. Until this point, I have focused on forms of STR that are associated with the developmental agendas of the state in order to highlight the fact that the state tends to be embedded in the establishment of agricultural settlements. The idea of state embeddedness in agrarian colonization helps us understand why there is usually a strong connection between territorial integration and cleared land. The transformation of the landscape known as deforestation is the end result of agrarian colonization, which is typically induced by the promise of ceding public lands (*baldíos*) to investors and landless peasants. Densely forested areas like the Amazon tend to be brown zones because the social conditions that favor both STR and deforestation are not present. The economic and political integration of the Amazon began in the late nineteenth century with the rubber boom (Uribe, 2017) and markedly accelerated during the developmental era of the mid-twentieth century (Marsh, 1983) when the state became deeply invested in promoting agrarian colonization and configuring a proper internal market (Boone, 2012).
Thus, political integration via developmental strategies is the primary explanation for the negative relationship between STR and forest cover.

This picture was fairly simple until the early 1980s. Once the developmental era came to a close, however, not only did the relationship between state and market shift in favor of fuller marketization (Harvey, 2007), but Colombia also witnessed a strengthening of the non-developmental i.e., ethnic and environmental agendas of the state (see Chapter 2). The empowerment of these disembedded agendas emerged in tandem with the implementation of neoliberal reforms. Put differently, two simultaneous transitions occurred at roughly the same time in the Amazon: the market gained a degree of autonomy from society (Polanyi, 2001) while the state began to broadcast power beyond the boundaries set by agrarian colonization. The transition from the developmental to the neoliberal era, and the corresponding retrenchment of the state form the market, coincided with a diversification of state goals beyond pure developmentalism in the Amazon (Orihuela, 2019).

As Chapter 2 explained, the scope of state functions gradually changed as Colombia began to pursue non-developmental goals. Consequently, following the developmental era, new land-use planning institutions reserve forests, national parks, and indigenous reservations were recognized in the Amazon and have come to complement the classic institutions of private property and mining concessions (see Figure 3.6).92

---

92 Although the institution of indigenous reservations is not new, the recognition of indigenous titles in the Amazon was uncommon prior to the mid-1970s.
As a result of these new agendas and land-use planning institutions, STR has become more diverse (Table 3.1). Since the early 1980s, densely forested areas of the Amazon have been undergoing an active process of territorial integration despite the fact that they have not undergone massive agrarian colonization.
Table 3.1

Sectoral Agendas of the State and State Reach in the Amazon over Time

<table>
<thead>
<tr>
<th>Sectoral agenda</th>
<th>Developmental era (1950s-1970s)</th>
<th>Neoliberal era (1980s-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agrarian</td>
<td>Promiscuous</td>
<td>Promiscuous</td>
</tr>
<tr>
<td>Extractive</td>
<td>Promiscuous</td>
<td>Promiscuous</td>
</tr>
<tr>
<td>Ethnic</td>
<td>Formal</td>
<td>Delegated</td>
</tr>
<tr>
<td>Environmental</td>
<td>Formal</td>
<td>Focalized</td>
</tr>
</tbody>
</table>

In light of this transition and the diversification of state goals, the idea that deforestation results from different degrees of territorial integration and that densely forested areas tend to be brown zones should be further clarified. Despite the fact that new forms of territorial integration have now emerged as a result of the strengthening of the state’s non-developmental agendas, I nonetheless defend the idea that forested areas in the Colombian Amazon should be characterized as brown zones. When my typology of STR is taken into account (see Chapter 2), we see that non-developmental agendas tend to promote types of STR that are largely formal, delegated, or focalized. Penetrating forms of reach, which Mann (1986) described as “promiscuous,” tend to be embedded in the integration dynamics that favor deforestation. Drawing on traditional concepts and theories of the modern state, I argue that dense forests in the Amazon are brown zones because penetrating forms of state reach rarely occur in forested areas.

Chapter 2 characterized the different sectoral agendas of the state and their associated forms of STR. This chapter, by contrast, analyzes the theoretical association between those forms of reach and cumulative deforestation in the Colombian Amazon. Together, these two chapters enable us to understand why deforestation continued after
the 1980s, even as the amount of land that has been incorporated as a national park or an indigenous reservation has likewise increased.

In conclusion, I hypothesize that cumulative Amazon deforestation is the result of different degrees of territorial integration into the market economy and state project. Deforestation can be seen as a sign of territorial integration in the making. The dense forests of the Amazon tend to be brown zones because the very social conditions that favor both deforestation (in the short term) and STR (in the long term) are largely absent. At the same time, STR has diversified due to the empowerment of non-developmental agendas, which tend to be detached from agrarian colonization. The post-1980s Colombian state reaches territories beyond the agricultural frontier, but these new forms of reach are less penetrating and tend to be formal, delegated, or focalized.

3.4. Types of Integration: Cumulative Deforestation Among Integrated Areas

3.4.1. From Degrees to Types of Integration

I have argued thus far that the relationship between STR and cumulative deforestation is explained by the state’s embeddedness in agrarian colonization. I have proposed that different levels of cumulative deforestation first result from different degrees of territorial integration. This is the primary reason that STR increased throughout the twentieth century in tandem with forest depletion in the Amazonian foothills. However, even Amazonian provinces with a relatively high degree of integration exhibit different levels of cumulative deforestation, suggesting that our
explanation is incomplete. We must now account for different levels of cumulative deforestation among regions with both active agrarian frontiers and relatively similar degrees of integration.

By systematically comparing deforestation levels among the most integrated provinces of the Colombian Amazon, I am able to capture the enduring effects of state policies whose objective was the promotion of regional development. Although Caquetá and Putumayo are the two most integrated provinces of the Colombian Amazon, the former has much higher levels of cumulative deforestation than the latter (see Chapter 1).

Why has Caquetá historically experienced much higher levels of deforestation than Putumayo? The literature on Amazon deforestation provides interesting clues to this puzzle in its identification of cattle ranching as the main proximate driver of deforestation in the Colombian Amazon (Etter et al., 2006). Nevertheless, studies of tropical deforestation in Colombia typically limit their inquiry to the proximate drivers of deforestation and rarely assume a historical and social perspective. As a result, they tend to naturalize economic development pathways.

By contrast, the historical perspective adopted in this dissertation sheds light on the reasons livestock farming became the dominant sector in Caquetá and not in Putumayo. It then becomes necessary to examine the way different types of integration account for additional subnational variation in deforestation among provinces with similar degrees of integration. In particular, I suggest that cumulative deforestation

---

93 Chapter 2 provided a brief explanation of the drivers of deforestation and the difference between direct and underlying drivers. See also Gest and Lambin (2002).
among regions with active agrarian frontiers is conditioned by the longstanding integration trajectories first configured by the Colombian state during the developmental era and subsequently reinforced by private actors.

Table 3.2 summarizes this paired comparison and suggests that different levels of cumulative deforestation among regions with active agricultural frontiers are the result of the different types of integration put in motion during the developmental era. The table begins with historical pre-conditions, that is, the prior transformations that facilitated the adoption of different integration pathways during the developmental era (Slater & Simmons, 2010). The two rows comprising the pre-conditional part of the table capture the state’s strategic interests in the Amazonian foothills during the first half of the twentieth century and the specific dynamics of early agrarian colonization. The second segment of the table describes state intervention and its consequences during the developmental era (1958-1982), a critical juncture at which different integration pathways were configured (Capoccia & Kelemen, 2007). These pathways are in turn responsible for different levels of cumulative deforestation. The final segment of the table captures the subsequent fate of developmental-era integration trajectories as their effects were amplified during the neoliberal era.

---

See Section 3.5 on research design and methodological approach.
Table 3.2

*Two Integration Trajectories in the Amazonian Foothills Through the Developmental Agendas of the State*

<table>
<thead>
<tr>
<th>Period</th>
<th>Domain</th>
<th>Integration through the agrarian agenda (Caquetá)</th>
<th>Integration through the extractive agenda (Putumayo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-conditions</td>
<td>Strategic interests</td>
<td>From low to high importance (internal threat)</td>
<td>From high to low importance (external threat)</td>
</tr>
<tr>
<td></td>
<td>Types of colonization</td>
<td>Peasant and corporate colonization (<em>colonización campesina y empresarial</em>)</td>
<td>Peasant colonization (<em>colonización campesina</em>)</td>
</tr>
<tr>
<td></td>
<td>Oil extraction promotion</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Commercial farming consolidation and democratization</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Neoliberal Era (1982-)</td>
<td>Private capital investments</td>
<td>Constant, stable, and unlimited demand for farming products</td>
<td>Interrupted, unstable, and limited local demand for farming products</td>
</tr>
<tr>
<td></td>
<td>Coca cultivation</td>
<td>Complemented and facilitated transition to legal farming. <em>Medium influence</em></td>
<td>Became dominant. <em>High influence</em></td>
</tr>
<tr>
<td></td>
<td>Cumulative deforestation</td>
<td>High</td>
<td>Medium</td>
</tr>
</tbody>
</table>

3.4.2. Pre-conditions: Changing Strategic Interests and Initial Agrarian Colonization

The integration trajectory of the Amazonian foothills, where Caquetá and Putumayo are located, was relatively uniform until the developmental era (1958-1982), when the two provinces began to diverge. However, two important aspects of the earlier period are worth noting: the strategic interests of the state and the particular type of colonization.
What I call the pre-conditional period lasted from the conclusion of the 1932 war between Colombia and Peru over Amazonian territories until the beginning of the developmental period at the end of the 1950s. The quinine and rubber booms of the late-nineteenth century triggered the earliest integration of the Amazonian foothills (A. Ciro, 2008; Zárate, 2008). Although both Caquetá and Putumayo were influenced by these extractive booms, the strategic interests of the Colombian state ended up focusing on Putumayo, which was a border province. A proper understanding of the integration trajectories of peripheral territories thus demands serious consideration of the evolving strategic logic of the state. The sustained advance of Peruvian rubber tappers, merchants, and companies threatened the interests of the Colombian state, which at the time delegated most state functions to the Catholic Church. Between the late nineteenth century and 1932, when the Colombian-Peruvian war ended, Colombia’s fear of losing its Amazonian territories critically shaped state-led development strategies (Uribe, 2017).

Prior to the war, Caquetá was strategically less important than Putumayo: it was located in the north and did not share a border with Peru. As classical bellicist theories of state formation would predict (Downing, 1992; Thies, 2005; Tilly, 1992), the necessity of combatting an external threat promoted heavy state-led investments in Putumayo, which lies along the Peruvian border. By the war’s end, the economies of both Caquetá and Putumayo were mostly extractive, though agrarian colonization was already underway.

Additionally, the Peruvian-Colombian war left two important legacies that influenced the dynamics of agrarian colonization and the strategic interests of the state in the post-war period (Vásquez, 2015). On the one hand, during the war, the army built two
roads to connect Caquetá and Putumayo with their neighbors Huila and Nariño. In a national context of demographic growth and land inequality, the new roads induced heavy migration to the Amazonian foothills. Agrarian colonization increased after the war in both regions, but Caquetá, in contrast to Putumayo, received not only peasants but also investors (Serrano, 1994). On the other hand, and more importantly, the strategic interests of the state in the Amazonian foothills changed with the resolution of the border conflict between Colombia and Peru following an exchange of territories. As classic bellicist theories would predict, this *de jure* recognition of international boundaries diminished the necessity of exercising *de facto* state power in the border region of Putumayo (Herbst, 2000).

In the post-war period, the strategic interests of the state changed focus from external to internal threat, and from Putumayo to Caquetá. State intervention in the Amazonian foothills after the war can only be understood in relation to these changing strategic priorities. Internal turmoil in the most integrated parts of Colombia increased following the war (Pecaut, 1978), which meant that the necessity of defending territorial sovereignty from the Peruvian threat was replaced by the imperative of ordering power domestically (Slater, 2010). Putumayo declined in importance relative to Caquetá, the province that quickly became associated with the effects and dynamics of internal violence (Molano, 1989).

Although social turmoil increased throughout the post-war period, historians of Colombia tend to highlight one particular period known as *La Violencia* (1946-1966). The two traditional parties and their constituencies clashed when the Conservative Party
gained power in 1946 and populist leader Jorge Eliecer Gaitán was assassinated in 1948. The Amazonian foothills were not directly afflicted by *La Violencia*, which mostly took place in the most integrated parts of the country where the hegemony of the Conservative Party was challenged (Ramírez, 2011). *La Violencia* thus had a political geography that enables us, for analytic purposes, to conceptualize it as an “exogenous shock” facilitating the metamorphosis of the state’s strategic interests in the Amazonian foothills (Slater & Simmons, 2010).

I argue that the vital role of *La Violencia* in the Amazon can only be understood by examining the dynamics of forced displacement and migration. Although population increased in both Caquetá and Putumayo, its timing, magnitude, and political characteristics differed. Partisan violence was pervasive in Huila and Tolima, which prompted an exodus of *colonos* to neighboring Caquetá. By contrast, for political reasons, Nariño did not expel as many people to Putumayo (Ramírez, 2011). The possibility that partisan violence would spill over into the Amazonian foothills, I suggest, shaped the uneven interest of the Colombian state in Caquetá and Putumayo during the developmental era.

In conclusion, just prior to the developmental era, the strategic interests of the Colombian state in the Amazon foothills shifted dramatically. Putumayo was no longer a priority following the Colombian-Peruvian war. By contrast, Caquetá became a strategic region that received mass migration and capital investment and also risked reproducing civil violence in the early stages of the Cold War.

The developmental era was a path-breaking period, or a critical juncture, during which the integration trajectories of Caquetá and Putumayo began to diverge. The public policies implemented between 1958 and 1982 had long-lasting consequences. The Colombian state acted as a vital force reshaping nature-society relations in the Amazonian foothills, defining distinctive integration pathways for the two departments in question (e.g., Polanyi, 2001; Scott, 1998; E. Weber, 1976). More specifically, territorial integration was promoted through the agrarian agenda in Caquetá and the extractive agenda in Putumayo during this period.

Why, from a theoretical standpoint, do I view the state as a decisive force in Amazonia? There are at least two complementary reasons we might expect the state to play an important role in peripheral regions like the Amazon. First, the literature on economic development suggests that late developers tend to rely on heavy state intervention.95 Second, capital investments tend to be risky and costly in regions where labor is scarce, property rights poorly defined (De Soto, 2000), state institutions contested (Acemoglu & Robinson, 2012), tropical illness common (Acemoglu, Johnson, & Robinson, 2001) and infrastructure lacking (Herbst, 2000). Positing a central role for the state in the developmental era does not imply that it was the only relevant actor in the region, only that its intervention was more decisive than that of colonos and small-scale investors.

95 The connection between late development and state intervention was true for European late developers (Gerschenkron, 1965) and “doubly true” for the global peripheries (Kohli, 2004, p. 8).
Chapter 2 observed that integration occurs through at least four distinct sectoral agendas: agrarian, extractive, environmental, and ethnic. Among these sectoral agendas, the agrarian one is most wide-ranging, having the greatest effect on the largest number of people. Unsurprisingly, public policies that promote this agenda in forested areas tend to be expensive, since basic infrastructure is lacking and needs to be built (Peluso, 1994). The extractive agenda of the state, by contrast, tends to be less extensive: its impact is focalized (Saylor, 2014) and does not benefit as many families as the agrarian agenda does. The agrarian agenda has the potential to promote broad social development.

Given that economic resources tend to be scarce in developing countries like Colombia, the allocation of agrarian investments is rarely uniform across regions. Among peripheral regions like the Amazon, state authorities decided where to allocate scarce resources.

I argue that, during the developmental era, the agrarian agenda was advanced mostly in regions where the strategic interests of the state were compromised (Albertus & Kaplan, 2013). With the aim of ordering power and preventing violence in regions of recent agrarian colonization, the Colombian government actively promoted a non-redistributive land reform in which colonization of public land usually presented as “empty” was the most important strategy (Jimeno, 1989; Marsh, 1983). Instead of distributing land, state authorities decided to expand the agrarian frontier, which required them to lead, induce, and support agrarian colonization. Social development was

---

96 See Chapter 2 for a conceptualization on these four agendas of the state.
97 When economic exchange between the center and periphery is considered, the agrarian agenda involves high capital inflows to the region, while the extractive agenda mainly involves capital outflows.
promoted by expanding the agrarian frontier without threatening the interests of landed elites from the center (Fajardo, 1981).

However, agrarian colonization was not promoted evenly. Caquetá, unlike Putumayo, became a priority after the war with Peru. State authorities reacted differently to the effects of La Violencia, which transformed the strategic thinking of the Colombian state. State agencies like the Caja Agraria and the INCORA facilitated the transition from subsistence agriculture to livestock farming and incentivized additional migration to Caquetá. As a result, livestock farming consolidated and democratized in Caquetá, where integration through farming was promoted (Jimeno, 1989). Although there are some examples of state-led colonization (colonización dirigida) in Caquetá, the dominant role of the state was to support spontaneous colonization (colonización espontánea) and to incentivize further colonization (colonización inducida). Although oil was present in Caquetá, it was not exploited, apparently for technical reasons (E. Ciro, Barbosa, & Ciro, 2016).98

State intervention in Putumayo was very different: its integration during the developmental era was advanced through the state’s extractive agenda. The once strategic border region was left behind following the Colombian-Peruvian war. In Putumayo, the

---

98 This emphasis on the important role of the state in Caquetá would probably sound peculiar to scholars who study the economic and political development of the region. The literature regularly emphasizes the peripheral condition of the region and the absence of state-led comprehensive efforts to support colonization there (Centro Nacional de Memoria Histórica, 2017; Ferro & Uribe, 2002; Salgado, 2012). While not necessarily contradicting those findings, my dissertation reaches a different conclusion based on a different type of comparison. Instead of contrasting Caquetá with the Andean core or an ambitious ideal of state-led development, I compare Caquetá’s economic success with the most similar department in the Amazon: Putumayo. Although state investments have not satisfied the local populations, among the multiple regions where colonization has occurred, Caquetá has received the most attention and resources (Jimeno, 1989).
effects of *La Violencia* were less significant than in Caquetá. When the strategic interests of the state shifted from external to internal threats, Putumayo was no longer a priority. Put differently, state-led agrarian investments in Putumayo were minimal because its frontier status was no longer an important asset in the post-war period. Instead, state intervention focused on constructing the infrastructure necessary for oil extraction, a process that was delegated to the Texas Petroleum Company (CNMH, 2015). Since the extractive agenda is less wide-ranging than the agrarian one, one can argue that Putumayo gave more to the center than it received in return.

These different state-led strategies put in motion two distinct integration trajectories that in turn explain varying levels of cumulative deforestation. In Caquetá, the province that integrated through the agrarian agenda, state investments created a trajectory in which livestock farming was consolidated and to some extent democratized. During this critical juncture, Caquetá was able to speed up the transition from subsistence agriculture livestock farming, thus establishing the basic parameters that explain high cumulative deforestation. The opposite happened in Putumayo, where the state’s strategy focused on extractive activities. In Putumayo, the state promoted integration through the extraction of oil, a path that left the farming sector unconsolidated and explains the province’s medium levels of cumulative deforestation.

In conclusion, the developmental era was a critical juncture at which the Colombian state initiated two very different integration paths in the Amazonian foothills. At the close of this vital period, the once-similar departments of Caquetá and Putumayo were on divergent trajectories. The different levels of cumulative deforestation they
subsequently experienced, I argue, resulted from the different types of economic and political integration set in motion by the state during the developmental era. While agrarian development was promoted in Caquetá, leading to high levels of deforestation, extractive development was promoted in Putumayo, resulting in less intense deforestation.

3.4.4. Integration Trajectories during the Neoliberal Era (1982-Present)

The legacies of the developmental era continued to reverberate into the neoliberal period that began in the early 1980s, when major economic reforms were initiated in Colombia. By then, Caquetá and Putumayo were on two starkly different paths. In the years since, two important market-led developments—private capital investment and “coca colonization”—have affected the Amazonian foothills. But instead of radically altering the two regions’ integration paths, these developments reinforced them. To put it in theoretical terms, while the developmental era decisively shaped the integration pathways of Caquetá and Putumayo, since the early 1980s a resilient path dependency has set in.

At the close of the developmental era, the Colombian state began to retreat from the market. Neoliberal reforms impacted Caquetá and Putumayo at roughly the same time, but the substance and effects were markedly different. In Caquetá, a self-regulated farming market was already in place. The retreat of the state went hand in hand with the entrance and establishment of large private investors who introduced a stable, constant, and virtually unlimited demand for milk. The entrance of Nestlé played a crucial role not
only because it stabilized demand for milk but also because the company provided credits that facilitated both the conversion of colonos into cattle ranchers and the configuration of a proper dairy district (Serrano, 1994).

The situation in Putumayo was different. At the end of the 1970s, the province’s farming sector was barely consolidated. The retreat of the state was thus less consequential: state influence was already minimal and large-scale private investment did not introduce a comparable demand for the region’s most important agricultural commodities. As if this were not enough, the oil industry experienced a significant downturn at the beginning of the 1980s, further reducing local demand for farming products (CNMH, 2015). Comparing the role of large private investors in the two regions, one can conclude that presence (in Caquetá) and absence (in Putumayo) of stable and constant demand for farming products was the decisive factor reinforcing and amplifying preexisting integration trajectories, which in turn explain the regions’ different levels of cumulative deforestation.

The second major impact of the neoliberal era was the entrance and proliferation of coca crops in Caquetá and Putumayo, a phenomenon that affected the two departments at roughly the same time. Coca cultivation produced a demographic boom in the Amazonian foothills that was not directly promoted by the state. This phenomenon is typically referred to as “coca colonization” (colonización cocalera) (Ramírez, 2011). Certainly, coca cultivation and cocaine production are important in explaining how

---

99 Since the late 1980s, Nestlé has ceased to monopolize the demand for milk. However, it remains the single most important buyer in the region. See Chapter 5.
integration trajectories evolved and subsequently affected cumulative deforestation in the post-developmental period (Dávalos, Sánchez, & Armenteras, 2016; Torres, 2011). Nevertheless, since both Caquetá and Putumayo have produced coca for almost four decades and their deforestation levels are very different, the effect of the illegal economy on deforestation demands further study.

To this end, and on the basis of our paired comparison between Caquetá and Putumayo, I offer a hypothesis to explain the effect of coca cultivation on deforestation. The distinction between proximate and underlying drivers of deforestation (Geist & Lambin, 2002) is useful in understanding the contribution of coca crops, which influence deforestation in both ways simultaneously. As a proximate driver, coca cultivation impacts deforestation by requiring the clearance of land. As an underlying driver, the production of coca influences deforestation by changing the regional economy. Despite the fact that coca crops often require new land clearance, I suggest that, as a proximate driver of deforestation, land clearance alone cannot explain the differential levels of cumulative deforestation in the Amazonian foothills. After all, coca cultivation rapidly accelerated in Putumayo during the 1980s and 1990s.

For this reason, my intuition is that the underlying effect of coca crops on the regional economy has been more consequential than their proximate effect. The paired comparison between Caquetá and Putumayo helps illustrate this difference. When coca crops reached the Amazon, Caquetá and Putumayo were already on different integration paths. Unlike in Putumayo, Caquetá’s commercial farming economy had been

100 Large coca plantations, uncommon in the past, are practically nonexistent today (Salgado, 2012).
consolidated and to some degree democratized. These different starting points in turn shaped the effects of coca crops on the regional economy: while coca cultivation reinforced the legal farming economy in Caquetá (E. Ciro, 2016), it quickly became the only rural product in Putumayo (Ramírez, 2011).

My dissertation provides evidence to support the idea that the underlying effect of coca crops on cumulative deforestation was (1) more important than the proximate effect, and (2) conditioned by the different characteristics of the two departments’ integration paths. Put simply: coca crops in Caquetá contributed to the consolidation and democratization of the livestock economy, which was not an option in Putumayo. In Caquetá the relationship between the illegal and the legal economy is very fluid. There is no sharp division of labor between coca growers and cattle ranchers (E. Ciro, 2016). The former could invest in cattle and pastures, while the latter could cultivate coca in order to sustain or invest in a legal farm. In Putumayo, by contrast, coca colonos lacked a viable legal farming alternative through which to supplement or replace their existing crops.

In sum, high cumulative deforestation in the Amazonian foothills largely results from integration successes rather than failures. Deforestation is thus the environmental consequence of a consolidated and relatively democratized commercial farming economy that state agencies inaugurated during the developmental era, and which the market expanded in the subsequent neoliberal period. Regions that were not integrated through

---

101 Where a division of labor exists and individuals produce for only one market, ranchers and coca growers may coordinate in order to promote rural development.
the agrarian agenda, by contrast, tend to have relatively low levels of cumulative deforestation.

3.4.5. The Legacies for Advancing Environmental Policies

The two distinct integration pathways described above have bequeathed at least three entrenched legacies that transcend the economic arena and limit the concrete possibilities for advancing environmental policies in the Amazonian foothills. I propose that two very different moral and political economies were configured in Caquetá and Putumayo during the second half of the twentieth century. Table 3.3 below summarizes these three legacies and gestures at the dearth of cultural and political incentives to adopt anti-deforestation policies in Caquetá, where deforestation is most advanced.

Table 3.3
The Legacies of Different Types of Integration

<table>
<thead>
<tr>
<th>Domain</th>
<th>Agrarian Integration (Caquetá)</th>
<th>Extractive Integration (Putumayo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral economy</td>
<td>Honors agrarian colonization, land clearance, and cattle ranching</td>
<td>Honors agrarian colonization and land clearance, but also diverse economic sectors</td>
</tr>
<tr>
<td>Politics of anti-deforestation policies</td>
<td>Strong opposition and few local allies</td>
<td>Weak opposition and many local allies</td>
</tr>
<tr>
<td>Politics of extractive mega-projects</td>
<td>Unified opposition</td>
<td>Fragmented opposition</td>
</tr>
</tbody>
</table>

First, our two integration paths have configured two distinct moral economies. Thus far my dissertation has assumed that social action is mostly guided by instrumental-
rational considerations (M. Weber, 1968). However, because Amazon deforestation is a complex phenomenon that transcends utilitarian motivations, I take up Weber’s invitation to recognize the importance of value-based considerations. Indeed, the idea of a regional moral economy helps shed light on the transcendent values associated with land clearance. Among classic works of political science, James Scott (1976)’s *The Moral Economy of the Peasant* is worth mentioning. Scott argues that resistance to economic innovation depended on certain moral arrangements in peasant societies that took into consideration the peasantry’s subsistence problem.

Residents of the Amazonian foothills tends to value agrarian colonization because doing so bestows recognition on colonos’ efforts. However, beyond this bottom line of recognition, important differences have emerged between Caquetá and Putumayo. The region that managed to consolidate commercial farming, Caquetá, has developed a proper cattle culture, which valorizes the transition from subsistence agriculture to cattle ranching. Indeed, livestock farming is perceived at the local level as the highest economic “vocation.” By contrast, in Putumayo, the province that was not integrated through the agrarian agenda, a wider variety of economic sectors are valued. The dominant moral economies of the two regions represent enduring legacies of the developmental era, legacies that constrain contemporary possibilities of “going green.”

---

102 I adopt a descriptive rather than a normative definition of moral economy. In other words, I study the way transcendent values influence agrarian colonization but do not myself assume that particular actions are better than others (Carrier, 2017). For a history of the concept see: (Götz, 2015).

103 There is an interesting debate among political scientists about the utility and scope of the moral economy paradigm. See, for example, Arnold (2001), Booth (1994), and Farmer and Bates (1996).

104 Although culture certainly matters, one can hardly conclude that the lack of “environmental consciousness” is the main driver of Amazon deforestation.
Second, when it comes to the politics of anti-deforestation policies, our two integration trajectories establish different sets of political (dis)incentives for environmental protection. Deforestation is rarely a salient political concern in the Amazonian foothills because farming—the main driver of land clearance—is the economic activity that directly or indirectly sustains most of the local population. Therefore, anti-deforestation policies tend to come from outside and above. Unsurprisingly, critiques of anti-deforestation policies for neglecting development concerns are common in regions like Caquetá, where integration took place through the agrarian agenda. In Putumayo, by contrast, where oil extraction is the primary economic sector, the situation is very different and opposition is mild. Put simply: anti-deforestation policies have few local allies in places where cumulative deforestation is high.

Finally, in relation to the politics of extractive mega-projects, I hypothesize that regions like Caquetá, which were integrated through the agrarian agenda, will tend to oppose the advancement of contemporary extractive mega-projects. Oil extraction has not featured in their longstanding integration trajectories, and the conflict with extractive mega-projects resembles a conflict among economic sectors. By contrast, I predict that opposition to oil extraction will be weak and fragmented in regions like Putumayo that were integrated through the state’s extractive agenda. Since extractive activities were introduced decades ago, the oil industry has supporters at the local level, with the result that opposition is divided.

In conclusion, this section generated hypotheses to explain different levels of cumulative deforestation among Amazonian departments characterized by similar
degrees of integration. I argued that variation in cumulative deforestation results from the different types of integration promoted by the state during the developmental era. When neoliberal reforms and non-developmental types of STR began to emerge in the early 1980s, Caquetá and Putumayo were already on two different integration paths. I also considered how the moral and political legacies of these integration paths constrain contemporary efforts to protect the forest. Not only is Caquetá the Colombian department that has experienced the most deforestation, but compared to Putumayo it faces economic, cultural, and political obstacles that make environmental protection extremely difficult.
CHAPTER 4. BEFORE DIVERGENCE: INCREASING DEGREES OF INTEGRATION ON SIMILAR PATHS

“To appreciate this change properly, it is necessary to remember that not long ago the natives did not have a single horse or a dairy cow; they did not use pastures, nor take advantage of the grass of their fields, nor defend, nor enclose the fields; in a word, they were in the saddest abandonment, because, apart from corn... they did not know another industry, nor did they have progress.” Fray Fidel de Montclar (1927, p. 274)

4.1. Introduction
The previous chapters laid out the dissertation’s theoretical framework. Specifically, those chapters offered a parsimonious set of hypotheses describing the relationship between STR and cumulative deforestation in the Colombian Amazon. I argued that cumulative deforestation is the result of different degrees and types of integration. The objective of this chapter is to provide some empirical evidence in support of these hypotheses. Caquetá and Putumayo are the two most populated and economically developed departments in the Colombian Amazon (Meisel, Bonilla, & Sánchez, 2013), which explains why cumulative deforestation is higher in these departments as compared to less populated and developed provinces like Amazonas, Vaupés, or Guainía (see Figure 1.3). Caquetá and Putumayo are part of the historic and contemporary “arc of deforestation,” because they both have active and expanding agricultural frontiers.

This is the first of three historical chapters devoted to my paired, contextualized comparison between Caquetá and Putumayo, the two most similar Amazonian
departments that nonetheless exhibit different levels of cumulative deforestation levels. The main goal of this comparison, as I explained in Chapter 3, is to determine why Caquetá’s agricultural frontier has expanded faster than Putumayo’s. This chapter focuses on the “critical antecedents” that made substantial divergence between the cases possible during the developmental era (Slater & Simmons, 2010, p. 887). I describe the most important transformations that occurred before the critical juncture of the developmental era, not only to avoid temporal truncation but also to highlight the factors that facilitated and constrained integration strategies in that period. While this chapter examines deforestation that resulted from increased degrees of integration in the two departments, the next chapter focuses on the role of different types of integration.

My emphasis on critical antecedents reveals the scope and variation of the state-led strategies that were implemented in the Amazon piedmont during the developmental era. I show that countering the external threat from Peru was the core interest of the Colombian state in the Amazon before the 1932 Colombian-Peruvian war. During the second half of the nineteenth century, the quinine and rubber booms stimulated the encroachment of Peruvian rubber tappers and merchants, whose territorial demands were supported by the Peruvian government. The Colombian state, in turn, promoted the economic and political integration of the region by delegating important state functions to the Catholic Church. Before the international war, the Colombian state spatially concentrated its efforts on the Putumayo region because, unlike Caquetá, it is located along Colombia’s border with Peru.
When the war with Peru broke out, the Colombian state built the basic infrastructure to defend its territories along the Putumayo river. The war was resolved by the League of Nations and the two parties complied with the decision despite mutual mistrust. The wartime infrastructure projects facilitated additional migration to the Amazon, which was actively supported by the army. The rubber economy began to decline in favor of agrarian colonization. However, when the external threat abated, the strategic objectives of the state shifted to consolidating domestic public order. Internal turmoil impacted the Amazon by stimulating additional migration. Compared to Putumayo, in the post-war period, Caquetá received more migrants from neighboring departments and faced a greater risk from the spread of internal violence.

The present chapter has five sections in addition to this introduction. The second section provides a general overview of Caquetá and Putumayo’s similarities when it comes to both biophysical characteristics and pre-nineteenth century developmental paths. The third section describes the basic features of economic and political integration in Caquetá and Putumayo between the late nineteenth century and the 1932 Peruvian-Colombian war. The fourth section explores the increase in degrees of integration between the international war and the mid-twentieth century, just before the integration paths of Caquetá and Putumayo began to diverge. I then summarize my findings in a brief conclusion.
4.2. Geographic and Early Developmental Similarities Between Caquetá and Putumayo

4.2.1. Biophysical Characteristics

This section examines the most important biophysical characteristics of Caquetá and Putumayo. Controlling for biophysical characteristics is important because the deforestation scholarship has emphasized that factors like soil quality, climate, altitude, precipitation, and solar radiation affect, positively or negatively, commercial farming and its corresponding deforestation dynamics (see Chapter 2). Because Caquetá and Putumayo are so similar in these respects, I argue that differences in cumulative deforestation could not have resulted from biophysical differences.

Caquetá and Putumayo are not only part of the same ecological region but also share most relevant ecological and geographical attributes. These two territories are located on the eastern Andes, in the foothills of the Andean mountain range and on the large plains of the Amazon region (see Figure 1.3 above). Unsurprisingly, scholarship has found that soil quality in Caquetá and Putumayo is similar (SIAT-AC, n.d.). Furthermore, the altitude of the two provinces is similar: the vast majority of the land in both Caquetá and Putumayo is under 1,000 m.a.s.l,¹ which is an important factor because it affects climate in the tropics and because scholarship has determined that a sloping terrain impedes deforestation (Busch & Ferretti-Gallon, 2017).

¹ Despite this similarity, we should acknowledge a key difference: one of the three regions of Putumayo (upper Putumayo) has an average altitude of 2,000 m.a.s.l. This region’s soil is fertile and it is relatively more integrated and closer to the Andean region (Ramírez, 2011).
In addition, the contours of Caquetá and Putumayo follow the course of most Andean-Amazonian rivers, which originate from the highlands and flow to the great Amazon river in Brazil. In fact, “Caquetá” and “Putumayo” are also the names of the two most important tributaries of the Amazon river in Colombia (see Figure 1.1 above). These two rivers are navigable the entire year, even though their volume decreases in the summer (December-February). However, it is worth noting that the Caquetá river, the natural border between the two departments, is not entirely navigable (E. Ciro, 2018): it is interrupted by the Araracuara torrents (eastern Caquetá), a fact that limits international trade between Colombia and Brazil via the Caquetá river. By contrast, the Putumayo river, which delimits Colombian territory, is completely navigable. However, it appears that access to Brazilian markets is not consequential in explaining cumulative deforestation because twentieth-century markets in the two provinces gravitated westward—that is, towards the Andean region.

Finally, climate, rainfall patterns, and solar radiation tend to be similar in Caquetá and Putumayo. Average annual precipitation in the two provinces fluctuates between 4500 and 5000 mm. Solar radiation is also similar, though it tends to be slightly lower in the southern part of the Amazon piedmont. Despite these minor differences, there are strong reasons to believe that Caquetá and Putumayo have generally similar soil quality, altitude, climate, rainfall patterns, and solar radiation. Thus, divergences in farming development and cumulative deforestation cannot be explained by biophysical factors.
4.2.2. Integration Trajectories Before the Late Nineteenth Century

A long-term comparative analysis of cumulative deforestation in Caquetá and Putumayo must begin from the expansion of the Spanish empire in the sixteenth century. In this period, merchants and missionaries entered the region looking for gold, Indian labor, and souls to redeem with the aim of advancing civilization. Their initial plan was to replicate in the Amazon what they were doing in the Andean region, that is, establishing new settlements on top of indigenous towns (Balcalzar, 1995). However, the challenge in the Amazon was qualitatively different. Not only were the region’s native populations rarely settled but Europeans also tended to view the tropical rainforest as a particularly harsh environment. Historians and archeologists have shown that indigenous peoples in the Amazon had an extensive relationship with the forest formed through constant movement and shifting cultivation (Pineda & Llanos, 1982).

For this reason, one of the main challenges for the colonial and later Colombian state in the Amazon from the sixteenth to the early twentieth century was “reducing” the indigenous population—that is, limiting, controlling, and re-patterning both their movements and their most fundamental cultural habits (e.g., language, religion, subsistence, clothing, etc.) with the aim of creating European-like societies. To be clear, reductions were part of a civilizing process in which constant contact between natives and missionaries facilitated the cultural assimilation and displacement of the former

---

2 Chapter 2 explained the difficulties of state control in non-settled societies. See James Scott (2009)’s The *Art of Not Being Governed* for an interesting theoretical argument about the inverse relationship between state power and unsettled people. See Simón Uribe (2017) for an interesting critique to Scott’s argument and a historical narrative about the role of the Catholic Church in the Amazon.
(Bonilla, 1968). Reductions were also the first step towards securing indigenous labor and taxation (Gómez, 2015). Spatially, initial efforts were focused on the Putumayo region. Historians have found that indigenous population size was relatively high in the Putumayo region (Pineda, 1987).

Assimilation efforts were not always pacific. Missionaries and merchants were willing to enforce reductions and some indigenous groups resisted. This dynamic can be fully appreciated when considering the political history of Mocoa, the capital of contemporary Putumayo and the main colonial city in the Colombian Amazon. Mocoa was apparently founded in 1557 to promote and guarantee the extraction of gold (Castellvi, 1944). It later became an important center of administration in the Spanish government circuit formed by Quito, Timaná, Pasto, and Popayán. The establishment of Mocoa encountered violent resistance from the native populations mostly Mocoas and Andakis who constantly attacked and set fire to the town (Friede, 1953). As a result of this conflict between colonizers and natives, Mocoa was relocated at least four times through a cycle of “foundation-destruction-transfer-(re)foundation” (Sánchez, 2015, p. 74).

Early developments, nonetheless, were less consequential than one might think because they followed typical boom-bust cycles. When Colombia gained its independence from the Spanish empire, most missionaries left the Amazon region, which led to the decline or disappearance of most colonial towns, including Mocoa (Gómez, 2015).

---

3 See Sánchez (2015, pp. 58–63) for an enlightening discussion about the possible dates of Mocoa’s foundation.
2015). For that reason, I maintain that Caquetá and Putumayo were similar by the mid-nineteenth century because early differences between the regions of the Amazon piedmont did not leave long-lasting legacies and most early activity focused on Putumayo, which is not the region with the highest level of cumulative deforestation.

4.3. Increasing Degrees of Economic and Political Integration (1850s-1932)

This section describes the basic characteristics of territorial integration dynamics from the late nineteenth century to the 1932 Colombian-Peruvian war. I do not offer a complete historical narrative. My objective is to illustrate how Caquetá and Putumayo were integrated in a similar manner during the initial stages of agrarian colonization, following two non-timber extractive booms. Naturally, there were differences between Caquetá and Putumayo, but they do not present a problem for my argument insofar as Putumayo, which today exhibits less cumulative deforestation than Caquetá, was the more integrated region at the time. Understanding cumulative deforestation in the Amazon piedmont thus requires an explanation for the reversal of fortune that subsequently transformed our two selected cases (Acemoglu, Johnson, & Robinson, 2002).

4.3.1. Economic Integration Through Extractive Economies

Important transformations occurred in the Amazon piedmont between the second half of the nineteenth century and the first three decades of the twentieth century. During that period, two non-timber extractive booms—quinine and rubber—influenced the two
regions of interest at roughly the same time. I argue in this section that these booms had similar impacts on Caquetá and Putumayo.

The first boom resulted from the extraction of quinine, an anti-malaria medication derived from the *chicona* tree and coveted by European powers hoping to advance their colonial projects in tropical countries. The quinine boom promoted the early integration of the Colombian Amazon through an extractive economy that was no longer based on gold but on forest products (Zárate, 2001). The extraction of quinine markedly influenced the region from 1850 until 1884, when the resource was depleted in the inter-Andean valleys. At that time, indigenous peoples comprised a majority of the population in the Amazon (Ramírez, 1996). The number of merchants, mostly whites and creoles, steadily increased with the quinine boom. One of those merchants was the future general and president of Colombia (1904-1909) Rafael Reyes. During the quinine boom, Reyes was the legal representative of the Elías Reyes y Hermanos Company. His ambitious vision was to build a road between Nariño and Putumayo to connect the pacific with the Atlantic via the Putumayo and Amazon rivers (S. Uribe, 2017).

Although the quinine boom configured an extractive economy, it left important spatial and infrastructural legacies. New population centers were established along with trails connecting the Andean region with the Amazon piedmont. To facilitate the connection between the Andes and the Amazon, most new towns were located in the piedmont (next to the Andes) and near a navigable river (Zárate, 2001). Until the twentieth century, rivers were the vertebrae of the Amazon piedmont, facilitating both movement and the settlement of explorers, hunters, sawyers, natives, and *colonos*
(Brucher, 1974). During the quinine boom, Mocoa, the capital city of Putumayo, was still the most important and established town of the Colombian Amazon region (Gómez, 2015). The quinine boom ended in 1884 when European powers began establishing plantations in their new colonies and then discovered a chemical substitute.

A rubber boom shortly followed the end of quinine extraction, benefitting from the basic infrastructure the previous boom had left in place. In fact, there are many examples of quinine merchants who transitioned to the extraction of rubber. Caquetá and Putumayo were already connected to their neighbors in the Andean region by the trails that had enabled merchants and missionaries to cross the Andean mountain range. The international demand for natural rubber also left profound impacts in the Amazon between the late nineteenth century and the 1920s.

It is necessary to highlight that both the quinine and the rubber booms were purely extractive. There were no plantations in the Colombian Amazon, meaning that both forest products were obtained from wild trees. Extraction techniques varied, but they did not always require cutting down the tree, whose life was necessary to sustain economic activity over time (Zárate, 2008). Bleeding techniques particularly in Putumayo required the subsistence of the tree (Kuan, 2015). The forest experienced only selective degradation during these booms, with no significant transformation of the landscape. During the rubber boom, new centers of population and commerce emerged Florencia, Belén de los Andaquies, San Vicente del Caguán, and Puerto

---

4 However, it is worth noting that one week of travelling was necessary in order to reach Huila. Since Caquetá’s towns used to be poorly connected to one another, it was more efficient to cross the Andes twice to move up or down the department (Melo, 2016).
Rico and a complex network of trails connected them to the Andean region (Artunduaga, 1984; Melo, 2016). The new towns were mostly places to exchange rubber and acquire tools and products that could not be obtained in the forests where the wild rubber trees where located.

Because the Putumayo river was navigable and the region was home to larger native populations than Caquetá, Putumayo became the center of the rubber boom (Pineda, 1987). The Caquetá river, by contrast, was not completely navigable—an important difference at that time. The rubber boom promoted commerce with Brazil due to the introduction of steam navigation along the Putumayo river. Rubber circuits were mostly oriented towards the Amazon river, which was an important development given that the quinine economy promoted linkages with the Andean region (E. Ciro, 2008). This geographical shift resulted in the decline of commercial centers like Mocoa that emerged during the quinine boom (Sánchez, 2015).

Similarly, merchants employed indigenous labor to collect the white sap of the Hevea trees in the vicinity of the region’s most important rivers. The exploitation of rubber was a violent process in which indigenous peoples in Caquetá and Putumayo suffered greatly (CNMH, 2014). Indigenous peoples were enslaved en masse, exploited, displaced, and assimilated during this period (Taussig, 1986). The rubber economy brought about the beginnings of a demographic shift in which native populations ceased to be the majority of the population in the Amazon piedmont. The second phase of that shift came with the advancement of agrarian colonization following the rubber boom.
4.3.2. The Varied Spatial Manifestations of the External Threat

Amazonian territories became an object of international dispute between Colombia and Peru when rubber merchants and investors from the two countries reached the region of the Putumayo river. Both the constant exhaustion of rubber trees and the new commercial possibilities presented by the Amazon river induced further encroachment by newcomers. Peruvians steadily moved north to extract rubber from a territory that Colombia possessed on paper but barely controlled in reality. The growth of the Amazon Rubber Company Casa Arana was perhaps the most salient example of Peruvian advancement in the north (CNMH, 2014). Peruvians were able to acquire substantial influence in the region because Colombian rubber merchants were not as economically successful and eventually sold out to Peruvian buyers.

The rubber boom thus generated a border dispute between Colombia and Peru, which was channeled through diplomatic and military channels. While Colombian authorities complained about the unauthorized encroachment of Peruvian companies and investors, Peruvian agents argued that de facto possession was more important than juridical recognition. The entrance of Peruvian merchants and companies was implicitly supported by the Peruvian government, which steadily deployed its army and navy to the region (see, e.g., Weinstein, 1983). Diplomatic disputes and violent clashes erupted during the first decades of the twentieth century. The Colombian state responded by increasing state involvement in the southern part of the Amazon piedmont as a means to control the plains and defend national integrity.
However, the Colombian state expanded its presence through delegation. State-like functions were formally delegated to the Catholic Church—the Capuchin Mission—which soon became the political, civic, and religious authority in the Amazon piedmont (Bonilla, 2006; Kuan, 2015; Serje, 2011; S. Uribe, 2017). In 1913, Fray Fidel de Montclar claimed,

> the missionary with faith has introduced civilization and progress, and the Church, by extending the boundaries of the spiritual kingdom, has expanded the borders of the Nation that has supported her divine work… the firmest step that Colombia has taken in its advance towards the Amazon has been led by the church (Republica de Colombia, 1913, p. 36).

Recalling my earlier typology of the varieties of state reach, we can conclude that STR in the Amazon was mostly delegated (see Figures 2.2 and 2.3). At the end of the nineteenth century and in the first decades of the twentieth century, both Caquetá and Putumayo were deeply influenced by the Capuchin Mission, which was tasked with promoting “civilization” in the Amazon. As Víctor Bonilla (1968) has argued, the Capuchin monks not only served god but enslaved indigenous peoples. In so doing, they employed some of the trails that the quinine and rubber merchants had used.

In its early years—i.e., between 1893 and 1905—the Capuchin Mission launched expeditions, some of them relatively well-documented, along the Amazonian rivers. Most expeditions departed from Putumayo and some reached the territory of Caquetá, which required missionaries to travel downstream on the Putumayo river and upstream on the Caquetá and Orteguaza rivers. The expedition-based approach was modified after 1905, when the Mission decided to implement a more ambitious strategy involving the
establishment of new towns and settlements. Figure 4.1 illustrates the towns that the Capuchin monks founded or re-founded between 1905 and 1925.

*Figure 4.1. Towns founded or re-founded by the Capuchin monks (1905-1925) Reprinted from Kuan (2015, p. 203).*

At the time, Caquetá and Putumayo were part of the same political unit, which first belonged to the Cauca territory and then to the “great territory of Caquetá.” Caquetá and Putumayo nonetheless received unequal treatment. State efforts during this period were largely directed to promoting the integration of Putumayo. Caquetá was, so to speak, a periphery of a state: the influence of the Mission penetrated southern Caquetá but tended to disappear as one moved north (A. Ciro, 2016). However, these differences are inadequate to explain variation in levels of cumulative deforestation because cumulative deforestation is today more advanced in Caquetá than in Putumayo.
The dispute between Colombia and Peru over Amazonian territories provides the relevant context for the relatively high public investments in the south. In particular, the fact that the Putumayo region was a border territory helps us understand why it received additional attention from the Capuchin Mission as compared to Caquetá. The ultimate goal of the missionaries was to reach the Putumayo river, establish a port, and configure a circuit of defense to preserve the sovereignty of the Colombian state (Academia Putumayense de Historia, 2012).

There are at least three clear examples illustrating the Capuchin Mission’s focus on Putumayo. First, the missionaries selected Putumayo to host the permanent headquarters of the Mission, which was first established in Mocoa and then moved to the Sibundoy Valley (Kuan, 2015). Second, newly created towns were also concentrated in Putumayo. On the basis of the geographical location of these towns, one can conclude that Putumayo was the core of the mission and that Caquetá played a secondary role. Figure 4.1 above illustrates that new towns were mostly located alongside the Putumayo river. These equidistant towns were consciously designed to supply a port for the Putumayo river. By contrast, the Capuchin Mission founded only three towns in Caquetá: Florencia, Belén de los Andaquies, and Las Guacamayas.

But the clearest example of the emphasis on the Putumayo region was the Mission’s massive infrastructure project connecting the city of Pasto in the Andean region with Puerto Asís in Putumayo (S. Uribe, 2017). Fray Fidel de Montclar recalled the role of the missionaries: “it was necessary to transform the missionaries into trenchers and priests into engineers in order to blow up the rocks, to destroy the mountain ranges…"
to bring the light of the Gospel to these remote regions” (Republica de Colombia, 1913, p. 36). The Capuchin Mission promoted the construction of the road by relying on indigenous people in the upper Putumayo, often forced labor, and colonos from neighbor Nariño (Bonilla, 1968; S. Uribe, 2017). The central government allocated additional resources to this road in 1911 following a small-scale battle (La Pedrera) between Colombian and Peruvian troops.

4.3.3. The Advancement of Agrarian Colonization

The agricultural frontier expanded in parallel to the advancement of quinine and rubber extraction. Scholars tend to agree that both agriculture and livestock farming were secondary sectors during the extractive booms: they supported the extractive economy and provided for the local market (A. Ciro, 2008). The sustained entrance of merchants into the region promoted the development of the early stages of commercial agriculture by increasing the demand for food and incentivizing the use of the national currency (Kuan, 2015).

Amazon rubber became unprofitable when European colonial powers established rubber plantations in Asia (Coomes & Barham, 1994). International demand slowly disappeared and rubber merchants and tappers either abandoned the region or created permanent settlements (Zárate, 2008). When the rubber economy went bust in the 1920s, a massive transition from extractive non-timber economies to agrarian colonization commenced in both Caquetá and Putumayo. Extractive economies were slowly replaced
by agrarian colonization, stimulated by the decline of the rubber economy, migration from neighboring departments, and active promotion on the part of the missionaries.

In the Colombian Amazon rubber had been directly obtained from wild rubber trees. The transition from the rubber economy to agrarian colonization thus entailed a reconfiguration of human-nature relationships (Zárate, 2008). Unlike rubber extraction, agrarian colonization required a profound transformation of the landscape. The literature on Caquetá and Putumayo is rife with stories of land clearance by colonos. Settlers migrated, cleared land, built houses, hunted, started to cultivate crops, and formed families (Artunduaga, 1984; Melo, 2016; Perdomo & Quiñones, 2011). Newcomers mainly settled in rural areas, where they produced for their own subsistence and the local market (Artunduaga, 1984). Some pioneers were able to purchase cattle, but the average farm was small and cattle farming was a luxury that not everyone could afford (CNMH, 2017).

The Capuchin Mission, the representatives of the Colombian state at the time, played an important role in the advancement of agrarian colonization. Fray Fidel de Montclar argued that “it comforts the hearts of those of us who are interested in this territory to see the extensive logging of the jungle and the beautiful sown land that arise in those places that previously oppressed the spirit with their wild aspect” (1913, p. 43). The Capuchin Mission provided land, labor, tools, and training to colonos and indigenous peoples who were willing to participate in the creation of the new towns (Academia Putumayense de Historia, 2012). The Mission also established a farm with roughly 4,000 head of cattle in the upper Putumayo and used it to spread agriculture and cattle ranching
to both Putumayo and Caquetá. Capuchin missionaries introduced basic farming tools and techniques. According to the prefect Fidel de Montclar,

The purchase of domestic animals, the acquisition of horses for freight transportation; of pairs of oxen for wood dragging; of cows for making cheese or selling milk… are unequivocal symptoms that these natives already developed some foresight: leave laziness, so connatural to them, and already think on things of profit (1927, p. 275).

By the time agrarian colonization began to accelerate, the indigenous population had been diminished and the demographic shift was already underway. There is some evidence to suggest that the process unfolded differently in the two departments, with Putumayo’s colonos encountering more indigenous resistance than Caquetá’s. In Putumayo, conflicts between colonos and indigenous groups were more frequent and sometimes violent. Displacement, assimilation, and domination of indigenous groups (e.g., the Ingano, Siona, and Kofán) continued after the end of the extractive booms (Chaves, 1945, p. 240). Although instances of violence against indigenous people in Caquetá have been documented, the situation there was different: by the time agrarian colonization had decisively advanced, the indigenous population had already been significantly diminished (Pineda & Llanos, 1982).

In sum, prior to the 1932 Colombian-Peruvian war, both Caquetá and Putumayo had undergone consequential transformations led economically by merchants and creoles interested in the region’s land and resources and politically by the Capuchin Mission. The sustained advancement of the Peruvians into Colombian formal territory deeply influenced the state’s strategic interests, explaining its geographic focus on the southern
part of the piedmont. Increasing degrees of integration and a corresponding increase in deforestation were in the making.

4.4. From the Colombian-Peruvian War to La Violencia

4.4.1. The Outbreak of the 1932 War

Until the war, Caquetá and Putumayo had undergone increasing degrees of integration along similar paths, which for our purposes means that no substantial long-term differences between the departments up to that point can account for their different levels of cumulative deforestation. In 1932, the international dispute over Amazonian territories escalated into a limited war between Colombia and Peru when Peruvian troops took over the city of Leticia (Picón, 2010). Despite the variety of different trails then in existence, access to the Amazon region from the Andean core of Colombia was difficult during the war. For this reason, the army implemented ambitious infrastructure projects that configured a circuit of defense. The immediate effects of the war are an example of a state deploying territorial power in the face of an external threat (e.g., Thies, 2005; Tilly, 1992). The war confirmed the necessity of establishing military control and promoted the social and economic integration of the region. State power was deployed by building the necessary infrastructure for the army to reach Colombia’s Amazonian territories and by promoting the advancement of agrarian colonization (Brucher, 1974).

The army thus led the construction of the “National Defense Roads” and broke down the Andean mountain range that had made the connection between the Amazon and the Andean core difficult. The main purpose of these roads was to facilitate the entrance
of the army in order to counter the Peruvian threat between 1932 and 1933 (A. Ciro, 2008). The army relied on and upgraded the trails that the Church had built and established a connection between the two main towns of the Amazon piedmont—Mocoa in Putumayo and Florencia in Caquetá—and the Andean region (Uribe, 2017). The road between Pasto and Mocoa was a means to reach the new town of Puerto Asís (see Figure 4.2).

Figure 4.2. Puerto Asís in 1933. A boat to transport freight and soldiers to the Guepí campaign. Reprinted from Corpoamazonia’s historical archive in Mocoa (Putumayo).

The army made a similar investment in Caquetá and built a road connecting Caquetá with Huila (Altamira-Florencia), the purpose of which was to reach the Caquetá river in La Tagua through the Orteguaza river. A third road was built between Puerto Leguízamo and La Tagua, which facilitated the connection between the Putumayo and Caquetá rivers (Vásquez, 2015). Provisional bridges across the Orteguaza and San Pedro...
rivers were also built in Caquetá. The collaboration of civilians was essential during the war because they built the infrastructure and boats, provided timber for boats, and transported soldiers along the Orteguaza river between Puerto Venecia and La Tagua (G. Uribe, 1998, pp. 24–31). Besides these investments in road networks, the state built the Venecia Hospital, the military bases of Tres Esquinas and La Tagua, and the facilities of the Juanambú Battalion in Florencia (G. Uribe, 1998, p. 26). The Colombian Central Bank (Banco de la República) also opened a branch.

The army promoted the colonization of the Amazon by reliable colonos. Many of the soldiers themselves decided to settle in the boundary region (Uribe, 1998) and became the vanguard of the Colombian state along the Putumayo river. To prevent the advancement of the Peruvian army, the government also promoted colonization along the circuit of national defense in both Caquetá and Putumayo. For example, four state-owned boats were employed on the Orteguaza river with the aim of supporting colonization. A worker of these infrastructure projects said that these boats “… transported colonos for free and left them where they wanted. When these boats went down or up, they bought colonos’ firewood” (as cited in Uribe, 1998, p. 31).

4.4.2. Agrarian Colonization’s Dynamism After the War

The newly-built infrastructure and the crisis of the rubber economy facilitated both the transformation of merchants into peasants and the entrance of new colonos from neighboring departments (Brucher, 1974). The expansion of agrarian colonization was therefore one of the most important consequences of the international dispute. Migration
increased after the war at a similar pace in the two provinces, even though it was not always directed by the state. New trails were established, old ones were improved, and colonization quickly advanced. Although episodes of violence increased in the Andean core during the mid-1930s, they were barely linked with migration to the Amazon piedmont (G. Uribe, 1998, p. 45). Demographic increase, land inequality and the proliferation of smallholdings that did not guarantee basic survival in the relatively more integrated parts of Colombia were the primary motivations behind *colonos’* migration at that time (Fajardo, 1981). Colonization continued and increased during the thirties and forties, made possible and induced by new state infrastructure.

Landless peasant were the main agents of agrarian colonization in both Caquetá and Putumayo. Although official data on regional development and land use is difficult to find, there is some evidence to suggest that most settlers engaged in subsistence agriculture in both departments. For example, Milciadez Chávez, a renowned ethnographer and economist who visited Putumayo argued that *colonos* “were poor people [who] lacked both capitalist experience and capital to invest in new residences” (Chaves, 1945). Similarly, Gabriel Perdomo (2011), a well-known historian of Caquetá, compiled many testimonies suggesting that landless peasants were the main vehicles of agrarian colonization during the first decades of the twentieth century.

An important feature of the postwar period is the steady infusion of capital investments that occurred alongside the influx of landless peasants. Both Caquetá and Putumayo received investors from neighboring departments. The scope and location of these investments were different, however. Capital investments from Nariño increased
after the war and were concentrated in the upper Putumayo, the region that was most integrated to the market, relatively speaking. Cattle farming flourished in the upper Putumayo, with the Capuchin missionaries playing an important role in its promotion (Bonilla, 1968).

The situation was slightly different in Caquetá. Besides landless peasants, private investors from the Huila department entered the region and moved into the core of the piedmont. For example, the Lara family came from Huila with the aim of acquiring relatively cheap land and investing in cattle (G. Uribe, 1998, p. 52). In 1934, they established the “Land of the Lara Family,” known as Larandia, which became the biggest farm in Caquetá and the Colombian Amazon, which was focused on cattle breeding (Vásquez, 2015).\(^5\) The farm was located around 40 km from Florencia, where the municipality of La Montañita is today. The area of Larandia increased from 5,600 to 34,000 hectares in thirty years. The Lara family constantly acquired recently cleared land and hired landless colonos to chop down the forest (G. Uribe, 1998, p. 53).\(^6\) Although Larandia was a rare exception, scholars believe that the farm was very consequential for the development of the region (Brucher, 1974; CNMH, 2017). It became a model of economic appropriation, which most settlers wanted to replicate in their small openings.

In sum, I have provided historical evidence to suggest that after the 1920s agrarian colonization was expanding in both Caquetá and Putumayo. Landless peasants and

\(^{5}\) Larandia is possibly the clearest example of corporate colonization (colonización empresarial) in the Colombian Amazon region. This type of agrarian colonization is defined by the acquisition of land by private investors instead of landless peasants (see Chapter 3).

\(^{6}\) Furthermore, Larandia had a port and an airport from which cattle were exported to Huila and other departments (Vásquez, 2015).
investors from Huila and Nariño moved into the piedmont in a dynamic process that was stimulated by the investments that the Colombian state had made during the war.

4.4.3. La Violencia’s Impact in the Amazonian Piedmont

This section briefly emphasizes the formative role of partisan violence during the historical period (1946-1960) that Colombian historians know as La Violencia. It briefly reflects on the geography of partisan violence in the Amazon’s neighborhood, which is analytically conceived as an “exogenous shock” that helps us understand why different state-led strategies were implemented in the Amazon piedmont during the developmental era, that is, the critical juncture that largely explains different levels of cumulative deforestation.

Internal turmoil was mostly located in the Andean region and the inter-Andean valleys of Colombia (Oquist, 1980; Pecaut, 1978). On the basis of the political geography of La Violencia, I propose that its most important effect on the Amazonian piedmont was mediated by the dynamics of migration. A comparative study of population growth is thus necessary to understand why cumulative deforestation in Caquetá is higher than it is in Putumayo. Figure 4.3 illustrates population growth in Caquetá and Putumayo between 1928 and 1973. This figure plots population density (left axis), operationalized as the amount of people per square kilometer, and the absolute number of people (right axis) that official censuses register.
Three conclusions emerge from this figure. First, total population size in Caquetá and Putumayo was roughly similar until 1951, after which Caquetá’s population markedly increased. In 1928, just before the Colombian-Peruvian war, Putumayo had more inhabitants than Caquetá. This different starting point provides additional evidence to support that idea that Putumayo was slightly more integrated than Caquetá thanks to the rubber economy and the necessity of defending Amazonian territories against Peruvian encroachment. Second, although the reversal of fortune between Caquetá and Putumayo begun in 1938, differences were moderate until 1951. Between 1951 and 1973, Caquetá’s population grew to more than double Putumayo’s. Third, because Caquetá has more territory than Putumayo, the former’s population density tends to be relatively low. The number of people per square kilometer in Caquetá is consistently smaller than in Putumayo.
The Amazonian foothills were, relatively speaking, peaceful regions during La Violencia (Uribe, 1998). However, this period is important for understanding variation in cumulative deforestation in the Amazon because it influenced the amount and type of migration that Caquetá and Putumayo received from neighboring departments, that is, Huila-Tolima and Nariño, respectively. It is worth noting that there is no specific information available about forced displacement during this period. The linkage can thus only be inferred from data on homicide rates and population origins. As depicted in Figure 4.4, the homicide rate in Huila-Tolima was much higher than in Nariño: these departments were above and below the national average, respectively.

![Figure 4.4. Homicide rate in ejecting regions (1946-1960)](image)

Data from Chacón (2004) based on Colombian Police.

On the basis of this difference, I suggest that relatively high levels of violence in Huila and Tolima are an important factor in explaining high rates of early migration to Caquetá. Unlike in Putumayo, migration to Caquetá from violence-afflicted neighboring
departments rocketed. One can thus argue that violence in the neighborhood explains differences in the timing and rate of migration to Caquetá and Putumayo. Figure 4.5 depicts the geographic origins of migrants to Caquetá and Putumayo and highlights the regions afflicted by La Violencia.

Figure 4.5. Origin of Caquetá, Putumayo, and Meta’s migrants
The consequences of La Violencia were not limited to population dynamics. In addition, the diffusion of actual violence was more likely in Caquetá as compared to Putumayo (Ramírez, 2011; G. Uribe, 1998). Caquetá became a “red frontier” because many newcomers were close to the liberal guerrillas who were fighting the conservative government: northern Caquetá received refugees belonging to the liberal guerrillas (Diez, 1990, p. 97). These guerrillas became the germ of the FARC in regions like Caquetá (González, 1992; Vásquez, 2015), where this guerrilla group underwent a process of transformation from a peasant to a war organization (Pizarro, 2011). By contrast, the diffusion of violence into Putumayo was unlikely. Communist guerrillas like the FARC only arrived in Putumayo with the coca cultivation boom of the mid-1980s (CNMH, 2012; Ramírez, 2011).

In sum, La Violencia can be interpreted as an “exogenous shock” that helps explain the origins of different state-led integration strategies in the Amazon piedmont during the developmental era. The Colombian state focused on Caquetá the implementation of a non-redistributive land reform (based on the allocation of public land) in order to achieve its goal of neutralizing violence in the Andean region and preventing new forms of violence in the Amazon (see Chapter 5).

4.5. Conclusion

This chapter has laid out some of the critical antecedents necessary to understand the magnitude of the historical changes that occurred in the Amazon during the developmental era. Although the integration degrees of both Caquetá and Putumayo
increased between the late nineteenth century and the developmental era, their *types* of integration were still similar by the mid-twentieth century.

In particular, I have argued that the territorial integration of Caquetá and Putumayo prior to the developmental era can be divided into two phases. During the first phase, the degree of territorial integration of both regions increased between the late nineteenth century and the 1932 Colombian-Peruvian war. By the time the international war broke out, Caquetá and Putumayo were on similar integration paths. In order to counter Peruvian advancement into the Colombian Amazon, the state delegated power to the Catholic Church. Even though Caquetá and Putumayo received important investments before and during the war, public investments largely focused on Putumayo given its location along the border. Agrarian colonization initially advanced to support extractive economies and later became a viable alternative once the rubber economy collapsed.

In the second phase, which followed the 1932 international war, the influx of *colonos* increased in both Caquetá and Putumayo, suggesting that the legacies of the war did not differ significantly between the two regions. Agrarian colonization progressed in Caquetá and Putumayo following the rubber boom, thus transforming the landscape in the short term and promoting their territorial integration in the long term. Agrarian colonization was mainly advanced by landless peasants, although capital investments in the center of Caquetá and in the upper Putumayo played an influential role. While the establishment of state order was still an important concern after the war, the nature of the threat was different: the strategic interests of the state shifted from the external to the internal threat. Although partisan violence in the neighborhood incentivized migration to
the Amazon, the diffusion of violence presented a clearer risk in Caquetá than in Putumayo. In theoretical terms, the differential influence of La Violencia on Caquetá and Putumayo explains why the Colombian state implemented two different development strategies in those regions during the developmental era.

The next chapter argues that state policies implemented during the developmental era (1958-1982) were largely responsible for divergent cumulative deforestation in the Amazon piedmont. During this period, Caquetá and Putumayo, once seen as the most similar cases, embarked on distinctive trajectories of integration, which in turn produced different levels of cumulative deforestation.
CHAPTER 5. A CRITICAL JUNCTURE: SHAPING THE TWO TYPES OF INTEGRATION AND DEFORESTATION DURING THE DEVELOPMENTAL ERA

“High modernism was about ‘interests’ as well as faith. Its carriers, even when they were capitalist entrepreneurs, required state action to realize their plans. In most cases, they were powerful officials and heads of state. They tended to prefer certain forms of planning and social organization... because these forms fit snugly into a high-modernist view and also answered their political interests as state officials.” James Scott (1998, p. 5)

“The beginning of every great era coincides with an extensive territorial appropriation.” Carl Schmitt (1997, p. 38)

5.1. Introduction

The previous chapter presented the first part of a contextualized paired comparison between Caquetá and Putumayo, the two most similar provinces in the Colombian Amazon that nonetheless experience different levels of cumulative deforestation. I demonstrated that, despite minor differences, the ecological characteristics and long-term integration trajectories of Caquetá and Putumayo had yet to markedly diverge by the mid-twentieth century. In addition, I showed that the strategic interests of the Colombian state in the Amazonian piedmont changed in tandem with the advancement of the agricultural frontier during the first half of the twentieth century. The existential concern with the encroachment of Peruvian merchants and officials was steadily replaced by the necessity of ordering power domestically (Slater, 2010). The demographic and political impacts of La Violencia acted as an “external shock” facilitating the divergence of developmental trajectories in the Amazon region.
This chapter moves our paired comparison into the developmental era, conceived as a critical juncture during which two distinctive integration pathways were forged. Between the late 1950s and the early 1980s, the Colombian state implemented diverse regional policies that not only bequeathed profound institutional legacies but also help explain subnational variation in levels of cumulative deforestation. While the state actively promoted the consolidation of commercial livestock farming in Caquetá, its strategy for Putumayo centered on the extraction of oil, thus defining two separate integration trajectories.

The current chapter consists of five sections in addition to this introduction. The next section characterizes two starkly different patterns of deforestation in Colombia. Its conclusions are based on a unique set of data regarding forest cover over time that I derived from Landsat satellite images (see Chapter 3 for general information and Appendix 1 for details). The third section examines the state’s developmental-era strategies in Caquetá, the Amazonian department in Colombia with the highest levels of cumulative deforestation. The fourth section does the same for Putumayo, another active agricultural frontier that nonetheless exhibits relatively low levels of cumulative deforestation when compared to Caquetá. The fifth section offers a brief explanation for the persistence of Caquetá and Putumayo’s distinct integration trajectories into the neoliberal era. I then summarize the chapter’s conclusions in a final section.
5.2. Cumulative Deforestation in the Amazonian Foothills

The aim of this section is to demonstrate the existence of two distinct patterns of cumulative deforestation in the Amazon region of Colombia. I combine a visual presentation consisting of five maps (one map per decade since the 1970s, see Figure 5.1) with quantitative data on deforestation over time (Figure 5.2).

The maps in Figure 5.1 depict the results of my own analysis of historical Landsat images and illustrate the existence of two starkly different levels of deforestation in the area of study. As the two most populated and developed provinces of the Colombian Amazon region, Caquetá and Putumayo are both agricultural frontiers in constant expansion (Figure 1.3). Cumulative deforestation in Caquetá and Putumayo has not proceeded at the same pace, however. While Putumayo evinces comparatively low cumulative deforestation, forest loss in Caquetá overflows political-administrative boundaries, impinging on areas like Southern Meta in the north and Northern Putumayo in the south.
Figure 5.1. Cumulative deforestation and regrowth in the Amazonian piedmont (1970-2016)
Data for political-administrative divisions from the IGAC and data for land cover from Landsat images, which were retrieved from the U.S. Geological Survey. My own processing and data base (coauthored with Nicolás Herrera).
Figure 5.2 likewise illustrates two different patterns of cumulative deforestation in Caquetá (A) and Putumayo (B). It depicts non-forest land (land dedicated to uses other than forests), total rural population, and the relationship between them over time. On the basis of this data, we observe that both the area of non-forest land and the size of the rural population are larger in Caquetá than in Putumayo.

We should not conclude, however, that Caquetá has experienced greater deforestation simply because its area and population is larger than Putumayo’s. This becomes clear when we consider non-forest land per rural capita. This indicator is designed to facilitate historical comparison between the two provinces by accounting for both differences in rural population size and land area over time. I focus on rural population size because it is proximately related to land-use changes. The average non-forest land area per rural capita in Caquetá is 11.7 hectares; in Putumayo, by contrast, the average is 5.5 hectares. In other words, a rural resident in Caquetá produces more than double the deforestation of a rural resident in Putumayo.\footnote{These results do not radically change when the total population is considered. Non-forest land per person in Caquetá is 7.1 and 4.6 in Putumayo.} Furthermore, while incorporated land per rural capita has remained stable in Caquetá, it has decreased in Putumayo, where population increased faster than the area of non-forest land (see Figure 5.2).
Figure 5.2. Non-forest land area per (rural) capita in Caquetá and Putumayo. Population data from DANE and data for land cover from Landsat images, which were retrieved from the U.S. Geological Survey. My own processing and data base. A: Caquetá, B: Putumayo.


The academic literature on Amazon deforestation in Colombia finds that livestock farming is the most important driver of deforestation, and that Caquetá is the department most impacted by contemporary deforestation trends (Andrade, 1992; Armenteras, Rudas, Rodriguez, Sua, & Romero, 2006; Cabrera, Vargas, Galindo, & Ordoñez, 2011). Among the six entirely Amazonian departments of Colombia, Caquetá has the highest level of historical and contemporary deforestation. Unsurprisingly, most anti-deforestation policies and debates focus on Caquetá.

The purpose of this section is to explain the high rate of deforestation in Caquetá using empirical evidence. I argue that Caquetá’s cumulative deforestation is the consequence of an integration trajectory in which public and private strategies...
implemented during the developmental era (1958-1982) led to the consolidation and democratization of commercial farming. In addition to describing the expansion of cattle farming in Caquetá, I explain how this integration pathway is connected with rapid deforestation. Examining Caquetá’s integration experience is key to understanding the incentives, ideas, and institutions that drove cumulative deforestation in the department, and thus to developing our empirically-grounded theory of subnational variation in Amazon deforestation.

5.3.1. A Demographic and Developmental Big Push

In 1952, Colonel Juan B. Córdoba published his *Geographical Compilation of the Intendance of Caquetá*, which offers a useful baseline for assessing the economic and political integration of the region before the developmental era. Córdoba notes that Caquetá only had two proper roads at the time of publication. The first road, built during the war with Peru, connected Florencia with Gabinete in Huila (63km). The second stretched from Florencia to Montañita (36km), where Larandia, the farm of the Lara Family, was located. Florencia and Montañita were thus the two most integrated towns in Caquetá at the beginning of the 1950s. Apart from these two roads, Caquetá’s population had to use trails of varying quality to travel between the Andes and the Amazon.

This reality rapidly changed during the second half of the twentieth century. Until the early 1950s, agrarian colonization had proceeded in a linear fashion from west to east, following the banks of the rivers. However, rivers were soon replaced by roads as
agrarian colonization advanced (Brucher, 1974). Deforestation is closely linked to population dynamics, and Figure 5.3 illustrates how Caquetá’s population dramatically increased over the course of two decades. Based on official census data, it depicts total population over time disaggregated by urban and rural population. The century’s most important demographic change occurred between 1951 and 1964, when the population of Caquetá increased by 175%.

![Figure 5.3. Population in Caquetá (1928-2005)](image)

Data for population from the DANE.

Given this rapid demographic shift, it stands to reason that public and private actions taken between 1958 and 1982 had profound consequences. During the 1960s and 1970s, Caquetá acquired its distinctive appearance (Ferro & Uribe, 2002, p. 62). Livestock production was not only consolidated but also to some extent democratized during those years as part of the region’s demographic and developmental big push.
5.3.2. Integration Through the Agrarian Agenda

This section provides evidence for the claim that state agencies played a key role in shaping integration pathways during the developmental era. Although agrarian colonization and livestock farming were already present in Caquetá by the mid-twentieth century, the state decisively facilitated the transition from subsistence agriculture to cattle ranching and worked to consolidate the livestock industry. To be clear, I do not argue that the Colombian state completely directed the colonization of Caquetá, only that it employed strategies to support *colonos*, which in turn induced additional colonization of the region.

Agrarian state agencies like the Caja Agraria, the INCORA, the ICA, and the INDERENA actively promoted Caquetá’s colonization between 1958 and 1982. During this period, these agencies established a permanent presence in the region, even though they were legally dependent on the national government. In the developmental era, Caquetá was formally designated an ‘intendancy” rather than a department.² Unlike departments which were relatively autonomous from the center and were entitled to representation in the Senate and their own judicial districts—intendancies and commissariats, the so-called “national territories,” were administered by delegates of the national government and controlled by the DAINCO. All subdivisions of the Colombian Amazon were either intendancies or commissariats until 1981, when the Colombian Congress formally recognized Caquetá as a department.

---

² Until 1991, the Colombian territory was divided into departments, intendancies, and commissariats. Contemporary Amazonian departments used to be classified as “national territories,” that is, territories with inferior rights and duties (Serje, 2011).
What did Colombia’s agrarian agencies do in Caquetá, and what were the consequences of their intervention? Generally speaking, I argue that the strategies implemented by state agencies between 1958 and 1982 decisively shaped the integration trajectory of Caquetá by promoting directed colonization and then actively supporting spontaneous colonization. Both forms of support in turn induced the entrance of additional colonos, who sought to benefit from state development investments in the region.

Directed colonization was the dominant strategy at first. In 1959, the Caja Agraria, a public agency mainly dedicated to promoting access to rural credit, was legally authorized to invest part of its resources in colonization projects in different regions of the country (Law 20 of 1959). Three directed colonization projects were implemented in Caquetá during those years: La Mono (in Belén de los Andaquíes), Maguaré (in El Doncello), and Valparaíso (CNMH, 2017). The Caja distributed plots of land of roughly 50 hectares per family and supplied colonos with food during the early years. By 1962, the Caja had facilitated the settlement of around 500 families. The agency’s investments in regions like Caquetá were understood as a response to La Violencia.

The critical problem was to solve the situation of those compatriots whom a decade of violence had thrown over the cities. Therefore, those in charge of rehabilitating them economically and socially looked for a solution in the colonization of marginal territories. The first step was to sign an agreement between the existing Rehabilitation Office and the Agrarian Credit Fund. This agreement established the promotion of six colonization fronts. The Caquetá intendancy was among them (Bonilla, 1966, p. 20).

In addition to spearheading directed colonization programs, the agency promoted access to credit (Marsh, 1983). At the end of the 1950s, the Caja was one of the few
banks in Caquetá and certainly the most important one. It was also the main state agency in the region whose explicit goal was the advancement of agrarian colonization. Although the Caja promoted the cultivation of products like rice and maize, most credits were explicitly designed to facilitate the transformation of *colonos* into cattle ranchers. The agency provided both cash advances and the animals themselves. Thanks to the Caja, many *colonos* received the startup capital they needed to raise cattle. While the agency lent out 4.5 million pesos in 1959, the amount increased by nearly 400% to 17.7 million pesos in 1963 (Brucher, 1974).

The Caja also promoted the allocation of public land to landless peasants residing beyond the boundaries of its three directed colonization programs. Figure 5.4 depicts both the total area distributed per year and the cumulative percentage of public land that was transferred into private hands. The figure also emphasizes four historical moments, the first one being the empowerment of the Caja as a vital player in the colonization of Caquetá. The amount of land allocated clearly increased in the late 1950s with the new functions of the Caja, thus kicking off a trend towards the privatization of the Amazon—an important step in establishing the territoriality of the state (see Chapter 3). The number of non-directed *colonos* increased partly due to the possibility of receiving land property and credits from the state (see Figure 5.3 above).
Directed colonization programs, pro-livestock credits, and the distribution of public land continued during the 1960s and 1970s. However, the Caja’s activities were eventually restricted to the provision of credit. Law 135 of 1961 created the INCORA, which took over the other developmental functions of the Caja. The INCORA was deployed to Caquetá in 1963 (Resolution 25), and it quickly became one of the three most important regional offices in charge of promoting agrarian colonization in Colombia (Balcalzar, 1995; Melo, 2016). The objective of supporting colonization was to facilitate access to land without challenging the land tenure system in Colombia’s agrarian regions (Albertus, 2015).

Figure 5.4. Allocated public land in Caquetá over time
Data from the INCODER. A: Caja Agraria, B: the INCORA, C: Nestlé, D: The Caquetá Department.

---

3 The other two were located in Arauca and Ariari.
During the developmental era, and particularly between 1963 and 1982, the INCORA was the most important public agency in Caquetá. Most of the political leaders I interviewed mentioned that being the manager of the INCORA was much more important than being the governor of the Caquetá intendancy (interviews 12, 22, 31). Given the magnitude of its investments, the INCORA, unlike the intendancy, was an object of great political interest. Gustavo Artunduaga Paredes, a pilot and captain in the armed forces, is the best remembered director of the INCORA in Caquetá. The airport in Florencia was named in his honor.

What did the INCORA do in Caquetá, and why was the agency so important? First, the INCORA assumed responsibility for the directed colonization programs established by the Caja. Although the state’s interest in promoting directed colonization diminished over time, the INCORA continued to implement the three existing programs
and supported additional colonization initiatives advanced by state agencies like the army.⁴

Following the reduction of the Caja’s responsibilities, the dominant strategy of the state shifted from directed colonization to active support for spontaneous colonization, implying a wider scope of activity. The concrete strategies were not all that different at first. For example, the INCORA became responsible for the allocation of public land to landless peasants, which was among the primary instruments through which the state promoted population settlement. The important role of the INCORA in configuring the land market is widely remembered in the region, even if bureaucratic torpor and legal limitations obstructed the efficient distribution of land titles.⁵ Figure 5.4 above takes the form of an inverted U-shaped curve in which most peaks coincide with the time of the INCORA.

In addition to allocating public land, the INCORA also promoted access to credit for *colonos*. A former director of the INCORA in Caquetá explained in an interview its programs “promoted livestock farming by giving credits to peasants, credits that were characterized by low interest rates and a four-year grace period” (interview 67). As a result of these favorable terms, at least 97% of recipients managed to pay back their debts. An official report explained that 16,410 families benefited from the program and

---

⁴ For example, in 1964 the Colombian army and the Agrarian National Federation (Federación Agraria Nacional) promoted the displacement of indigenous groups from Tolima (*Pijaos*) to San Vicente del Caguán. After three decades, the Yaguárá II indigenous reservation was finally recognized. Indigenous groups were treated as if they were landless peasants and, unsurprisingly, most of them have adopted similar cattle ranching techniques (Marsh, 1983).

⁵ One of the main historical constrains on the allocation of public land to landless peasants is the existence of the forest reserves established by the Colombian Congress in 1959 (Law 2nd).
roughly 400,000 female cows and 11,000 bulls were distributed (Serrano, 1994). The INCORA funded roughly 50% of Caquetá’s cattle in 1976 (Michelsen, 1990, p. 20).

Furthermore, beginning in the mid-1960s, the INCORA invested in infrastructure and provided some of the basic public goods that colonos needed. The agency implemented two colonization projects in the region, Caquetá I and Caquetá II, with the assistance of World Bank financing (Marsh, 1983). Naturally, the INCORA was unable to satisfy the needs of the entire rural population of Caquetá, but the scope of its necessarily limited investments was impressive. The INCORA not only built roads, schools, and health care centers but also provided technical assistance, supported peasant organizations, and invested in malaria prevention initiatives. Table 5.1 provides a comparative summary of the INCORA’s investments in Caquetá and Putumayo between 1961 and 1980. The main conclusion one draws from the table is that the INCORA invested much more in Caquetá as compared to Putumayo. While the INCORA built 434 kilometers of road in Caquetá, it built not a single kilometer in Putumayo. The table illustrates that Caquetá was the colonization region in Colombia that received the most support from the state between 1961 and 1980.

---

6 With the aim of connecting the most important ports in Caquetá, Caguán and Orteguaza, Pescado and Peneya rivers with the “marginal de la selva” road, the INCORA built the following roads: from El Doncello to Maguaré the circuit of Río Negro, La Esmeralda, Puerto Manique; from Albania to Curillo; from Morelia to Valparaiso and Solita, from Paujil to Cartagena, from Libano to La unión Peneya, and km5-San Antonio de Getuchá, from Lusitania to Tres Esquinas del Caguán.
Table 5.1. 
*The INCORA’s Investments in Colonization Regions (1961-1980)*

<table>
<thead>
<tr>
<th>Project</th>
<th>Credit</th>
<th>Roads (Km)</th>
<th>Health</th>
<th>Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Families</td>
<td>Amount*</td>
<td>No.</td>
<td>Amount*</td>
</tr>
<tr>
<td>Caquetá</td>
<td>9900</td>
<td>512.3</td>
<td>434</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>59%</td>
<td>66%</td>
<td>47%</td>
<td>98%</td>
</tr>
<tr>
<td>Putumayo</td>
<td>641</td>
<td>17.8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>4%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Other Colonization</td>
<td>6326</td>
<td>241</td>
<td>497</td>
<td>2</td>
</tr>
<tr>
<td>Fronts</td>
<td>38%</td>
<td>31%</td>
<td>53%</td>
<td>2%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16687</td>
<td>771.1</td>
<td>931</td>
<td>127</td>
</tr>
</tbody>
</table>

* Million pesos

*Note.* Data for the INCORA’s investments from Jimeno (1989).

These figures do not, of course, indicate that state investments in the region were sufficient or that Caquetá’s inhabitants were fully satisfied with the performance of the state’s agrarian institutions. In fact, between 1972 and 1979, peasants actively mobilized to demand additional support for Caquetá’s colonization. “In this part of the country the struggle is not for access to land, but for credits, road projects in remote areas, education, health, and better prices for crops” (Ferro & Uribe, 2002, p. 62). These are the public goods that rural communities in Caquetá have demanded from the state and organized to obtain. Debt relief and the allocation of additional public land were the immediate gains of the movement.

In sum, state intervention during the developmental era (1958-1982) was a decisive factor in the consolidation of livestock farming in Caquetá as well as the transformation of many landless peasants into cattle ranchers. Indeed, livestock farming

---

7 Some scholars have even classified state intervention during these years as a “failure” (E. Ciro, 2016, p. 49).
was to some extent democratized in this period as raising cattle became an economic activity pursued by both elites and non-elites. The state-backed livestock industry was the main legacy of the developmental era.

5.3.3. The Role of the Market: Nestlé’s Dairy District

From the fact that the Colombian state played a vital role in defining a particular type of integration trajectory during the developmental era, one should not conclude that the state was the only relevant economic actor contributing to the consolidation and democratization of cattle ranching in Caquetá. Here we must consider the development of Caquetá’s dairy market.

Beginning in the mid-1970s, Nestlé invested in Caquetá and joined the state’s efforts to consolidate and democratize cattle ranching through the creation of a “dairy district.” The company first built a pre-condensing plant in Florencia (1974) and then reception and cooling plants in El Doncello (1977). These investments were part of Nestlé’s ambitious plan to become a “pioneer in the development of unexploited areas that were away from the main urban centers” (NESTLÉ, 1988, p. 1). When Nestlé entered Caquetá, state agencies like INCORA were already actively promoting the establishment of livestock farming. At the time, however, little of Caquetá’s livestock was devoted to the production of milk. Until the entrance of Nestlé, the main products were the animals themselves; milk and cheese were mostly produced for self-consumption or the local market (Michelsen, 1990). According to the company, before
Nestlé arrived in Caquetá, “there were no other companies interested in the collection, transportation, marketing and distribution of produced milk” (NESTLÉ, 1988, p. 8).

Given Caquetá’s focus on raising and fattening cattle and the relative underdevelopment of its dairy market, Nestlé had to play an active role in transforming and developing the livestock economy. In order to make its investments worthwhile, Nestlé implemented an ambitious “Milk Promotion Plan,” which linked up with public efforts to consolidate Caquetá’s livestock economy. Once the pre-condensing, reception, and cooling plants were built, Nestlé began to collect milk from cattle ranchers. Using the existing but constantly expanding road networks, Nestlé established routes for collecting fresh milk (see Figure 5.5), of which “[t]here were 51… and more than one hundred collection points in 1987. The demand area covers almost all passable roads of the region and the banks of the main rivers” (Michelsen, 1990, p. 15).

Nestlé’s routes maintained a distance of 25 kilometers from Florencia because the company did not want to disrupt the growing urban milk market (NESTLÉ, 1988). Furthermore, Nestlé promoted the displacement of cheese production from suburban areas of Florencia to “distant areas, in which it is impossible for Nestlé to collect milk” (NESTLÉ, 1988, p. 17). It is probable that these decisions, justified by the necessity of protecting the local market, ended up accelerating outward development by promoting the incorporation of distant regions into the dairy market (Michelsen, 1990).
The investments were a real success. The company quickly became the first large-scale buyer in the region because it offered regular payments, consistent prices, and stable milk collection. Small and mid-size cattle farmers were offered an efficient and predictable way to sell their product at local collection points, thus avoiding the trouble of transporting heavy containers of perishable milk to urban centers, where prices were uncertain and demand limited (Michelsen, 1990). Despite complaints about Nesté’s unfair prices, most ranchers and locals tend to recognize the economic and social importance of the company (Marsh, 1983).
In addition to stabilizing the demand for milk, Nestlé actively invested in making Caquetá’s livestock farming suitable for both meat and milk production (ganadería doble propósito). It was necessary for the company to promote milk production beyond the mere establishment of constant demand. For example, Nestlé supported the creation and maintenance of new roads that allowed it to expand its operational area; facilitated ranchers’ access to cooling and storage facilities; issued credit to ranchers; provided technical assistance to improve productivity; and promoted the genetic improvement of both cattle and pastures.\footnote{When Nestlé arrived in Caquetá in the mid-1970s, most cattle were creole Zebu, a breed whose milk productivity is known to be low. Zebu is a type of cattle that originated in Asia and is well-adapted to the tropics and its diseases. The company subsequently promoted a combination of the Zebu (3/8) and Holstein (5/8) breeds, which can endure harsh climates but also produces abundant milk. Something similar occurred with pastures: Brachiaria, Leucaena, and Desmodium were introduced during these years as a result of the combined effort of the INCORA, the ICA, and Nestlé (Serrano, 1994).}

Table 5.2 presents the basic achievements of Nestlé’s Milk Promotion Plan and illustrates its far-reaching consequences. The table summarizes the company’s impact by showing the dramatic increase in its area of operation, number of suppliers, routes, and journeys, volume of milk collected, pasture area, and milking between 1974 and 1986. In slightly more than a decade, the area that Nestlé covered increased by 533%. “After 10 years of operations, the value of milk production was placed in third place among the main economic activities of the region” (NESTLÉ, 1988, p. 18).
Table 5.2

*Nestle’s Dairy Market in Caquetá*

<table>
<thead>
<tr>
<th></th>
<th>1974</th>
<th>1986</th>
<th>Variation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation area (km²)</td>
<td>3,500</td>
<td>14,700</td>
<td>420%</td>
</tr>
<tr>
<td>Suppliers</td>
<td>90</td>
<td>1,400</td>
<td>1556%</td>
</tr>
<tr>
<td>Daily reception routes</td>
<td>6</td>
<td>40</td>
<td>667%</td>
</tr>
<tr>
<td>Daily journeys (km)</td>
<td>720</td>
<td>3,840</td>
<td>533%</td>
</tr>
<tr>
<td>Daily average reception</td>
<td>2,444</td>
<td>50,000</td>
<td>2046%</td>
</tr>
<tr>
<td>(litters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meadows with pastures (ha)</td>
<td>800,000</td>
<td>1,280,000</td>
<td>160%</td>
</tr>
<tr>
<td>Total milking</td>
<td>21,000</td>
<td>105,000</td>
<td>500%</td>
</tr>
</tbody>
</table>

*Note.* Data from Nestlé (1988, pp. 11–15)

It is important to note that the fruits of this expansion were not concentrated in the hands of an elite few: public and private investments facilitated the consolidation of small and mid-size cattle ranchers. Unlike meat production, which requires time to raise and fatten cattle, dairy production ensures a constant income, easing the conversion of *colonos* into cattle ranchers (Michelsen, 1990). In fact, one can argue that the creation of the dairy district made livestock farming more accessible.⁹

As a result of public and private investments, Caquetá was able to establish and consolidate a dairy district that has been an important part of the regional economy since the developmental era. Nestlé was not only a vital player but also acquired a market monopoly. Although Nestlé’s demand for milk has steadily increased over time, its

---

⁹ The percentage of Nestlé’s suppliers producing less than 40 liters per day decreased from 95% in 1975 to 60% in 1986. Despite the reduction of small suppliers, the production of milk was not concentrated on few hands (NESTLÉ, 1988).
monopoly disappeared by the end of the 1980s as new companies, some of them local, began to emerge.

5.3.4. A Consolidated Livestock Economy in Constant and Rapid Expansion

I have explained thus far that the consolidation of the livestock economy, which the academic literature identifies as the main proximate driver of Amazon deforestation, resulted from an enduring integration trajectory shaped by both state agencies and private capital investments in the developmental era. Cattle ranching emerged as the dominant economic activity between 1958 and 1982, with clear implications for the environment. Figure 5.6 depicts the total number of animals in Caquetá over time, confirming the dramatic increase that occurred between 1958 and 1982.

Figure 5.6. Total livestock in Caquetá (1959-2018)
Data for the number of animals, between 1959 and 1985, from Michelsen (1990), and from the Caquetá’s Governor’s Office for the remaining series.
In addition, one of the most important achievements of the developmental era was the limited democratization of cattle ranching. Naturally, benefits were not equally distributed and there indeed remain pervasive inequalities that track those of Colombia’s rural sector as a whole. However, both rural elites and non-elites are deeply interested in the economic progress of the livestock economy.

A consolidated and relatively democratized livestock economy, therefore, constitutes the baseline condition for analyzing high cumulative deforestation in Caquetá, which has resulted from economic success rather than failure and from agrarian rather than extractive development. In this section, I examine the economic mechanism through which livestock farming in Caquetá is linked to deforestation. Because environmental activists tend to portray local actors as irrational, immoral, illegal, or oblivious (see Chapter 1), my goal is to study the concrete economic incentives at play. Cattle ranchers have indeed acted rationally, but their rationality is not of the type that environmental activists value.

In attempting to understand this rationality, we might first consider Caquetá’s soil quality, which is highly acidic and poorly suited for commercial agriculture. The soil is both old and constantly awash in rainfall. Poor soil quality constrains productivity, which must then be increased by incorporating new land area or introducing additional capital and technology. Livestock farming in Caquetá is extensive because it uses relatively large areas of land with low inputs of capital, labor, and fertilizers. The use of large areas of land is not driven by economic calculations alone: state intervention is also at play. Land
area is officially conceived in a way that compensates for acidic soils by introducing the idea of a Family Agricultural Unit (UAF), defined by the minimum amount of land that a family needs to survive.\textsuperscript{10} The size of the UAF varies according to agro-ecological conditions: a rural family in the Amazon region, for instance, needs more land than a family in the Andean region due to differences in soil quality. Therefore, land area alone is not an instructive metric.

In theory, it is possible to improve soil quality by investing in capital, labor, and fertilizers. In reality, however, it is more convenient to buy or clear additional land.\textsuperscript{11} Elites have bought or rented additional land in order to enlarge the number of animals in their possession. \textit{Colonos} are subject to strong incentives to sell or rent their land and to engage in colonization elsewhere. If \textit{colonos} are young enough and security conditions permit, there is always the option of establishing a new farm in parts the country where roads and basic state services are in short supply. Cheap or “free” public land is almost always available.

Wide availability of land and, thus, low purchase prices made investments to increase soil productivity unprofitable and the expansion of the frontier highly profitable. For example, the cost of controlling weed in one hectare of pastures was higher than the cost of one hectare of land (Michelsen, 1990, p. 48).

Furthermore, the existence of numerous legal restrictions on the recognition of private property national parks, forest reserves, indigenous reservations, maximum land area, administrative procedures of acquisition has not prevented the emergence of a

\textsuperscript{10} Law 160 of 1994, art. 38. A similar idea was recognized in 1961, when Law 135 introduced the concept of a UAF for the first time.
\textsuperscript{11} The use of fire is a modified version of the older slaw-and-burn agriculture system that has been used by indigenous peoples in the Amazon region and rural populations in the tropics for centuries.
land market. Extensive livestock farming has coexisted with a very active, informal market for recently cleared lands. Land accrues economic value due to labor inputs, and poor rural populations are either hired to work the land or act independently and then sell the fruits of their labor on the informal market.

Roads have been a crucial part of this story. Roads networks not only facilitate commerce between buyers and cattle ranchers but also promote access to basic state services (Moreno, 2015). In fact, roads delimit the milk market because buyers, as mentioned, established daily routes to collect this highly perishable product. Under such circumstances, colonos came to expect access to the market and state services, both of which require roads. During the developmental era, some roads were built by state agencies. However, most Amazonian roads, particularly secondary and tertiary roads, were built by community members themselves, who naturally take pride in their efforts even as they demanded support from the state to maintain, improve, enlarge, and pave existing roads (CNMH, 2017).

In sum, by the end of the developmental era Caquetá’s livestock economy had consolidated and to some extent democratized the milk, cheese, and meat markets, in which buyers local, national, and international interfaced with suppliers who were constantly expanding into new lands. Producers worked to ensure their accessibility in order to reduce transportation costs. The successful collective action of local populations in building and maintaining road networks is what made this happy marriage between supply and demand possible.
5.3.5. Caquetá Reaches “Adulthood”

The development of livestock farming in Caquetá also facilitated the consolidation of a regional elite that steadily gained political influence at the national level. The recognition of Caquetá as a department illustrates both the connections between regional elites and livestock farming and their leverage at the national level. Caquetá was the first Amazonian province to acquire the status of department through a bottom-up political process. The other Amazonian provinces, including Putumayo, were only recognized as full departments by the 1991 Constitution—that is, from the top down.

Caquetá’s economic and political elites formed a pro-recognition committee in the late-1960s to promote the intendancy’s incorporation as a department with equal rights and duties.12 Hernando Turbay Turbay, a talented liberal politician, party bigwig, and Caquetá’s most important congressman between 1968 and 1990 (Mojica, 1993), had always been a strong supporter of the idea of departmental recognition (Diario del Huila, 1979a). He was also the clearest example of a regional elite tied to the livestock economy—he was a rancher himself—who wielded significant national influence (Mojica, 1993). The recognition proposal was also backed in the 1970s by the liberal and conservative elites of Huila,13 Caquetá’s most developed neighboring department, and the

---

12 This pro-recognition committee was established by Hector Orozco, Floresmiro Robles, Gustavo Artunduaga, Jorge Daniel Santos, Rafael Urquina Tamayo, and Jorge Olaya Lucena y Oliver (Ortiz Fajardo, 1982, p. 110).
13 Three congressmen from Huila were particularly important: Alberto Galindo, Luis Enrique Valenzuela, and Rodrigo Lara Bonilla. In addition, Misael Pastrana (former Colombian president) and Bertha Hernández de Ospina (former first lady) supported similar initiatives (Diario del Huila, 1979b). Also important were Omar García Ortega (senator), Daniel Domínguez, and Armando Barona (Ortiz Fajardo, 1982, p. 109).
one from which most of its settlers had originated. The Colombian Congress, however, repeatedly rejected the initiative, arguing that Caquetá lacked the minimum number of inhabitants required by the 1886 Constitution before a region could be recognized as a department.

The question of recognition came to the fore during the presidential campaign in 1978, when Julio César Turbay Ayala, the uncle of Hernando Turbay Turbay, visited the region and promised grant Caquetá departmental status if elected president (Mojica, 1993). There are reasons to believe that the family relationship between Julio César and Hernando helped clinch Caquetá’s recognition as a department (A. Ciro, 2016, p. 50), although concrete evidence is lacking. Julio César Turbay Ayala, president of Colombia between 1978 and 1982, stood by his promises, and requested the elaboration of a legislative project. Turbay also tasked Germán Zea Hernández, the Minister of Government, with advancing the legislative process towards recognition of Caquetá as a department (Diario del Huila, 1979a).

The process of obtaining departmental recognition for Caquetá was difficult for at least two reasons. First, Caquetá only had 103 of the 370 thousand inhabitants that the 1886 Constitution (Art. 5) required. Given these shortcomings, the Colombian Congress could not recognize the intendancy without violating the Constitution, making a constitutional amendment necessary. Second, although it was necessary to gain the

---

14 Caquetá met the other requirements: local support, solid budget, and a favorable recommendation from both the national government and the Council of State (Art. 5).
15 Constitutional amendments were more difficult to pass because not only the two chambers needed to approve them twice but also it was necessary to obtain the positive vote of two-thirds of the members of each chamber (Art. 5).
support of both chambers of Congress, as an intendancy Caquetá was only represented in the lower house; it did not have a voice in the Senate.

In order to demonstrate that Caquetá deserved recognition as a department, the government argued that the census was outdated and that Caquetá was in compliance with the other requirements (Colombian Congress, 1981, p. 16). Records of the Congressional debate reveal that recognition was justified by the necessity of promoting full political integration. Caquetá was compared to a child who had grown up and reached adulthood, and congressmen pointed to the national interests at stake: taking advantage of the territory’s rich natural resource endowments; recovering the region from abandonment (El Espectador, 1981); preventing the expansion of guerrilla forces; and recognizing the courageous efforts of the local population. According to Daniel Domínguez, Congress’s reporting speaker, the proposed reform made “feasible the longing of a noble, hardworking people, who cleared the jungle with the swing of their axes and hoes, opened furrows in the earth, and projected a promising future” (p. 23).

The Colombian Congress unanimously amended the Constitution to facilitate the recognition of Caquetá as a department (Colombian Congress, 1981, p. 24). The Constitution now explicitly authorized Congress to establish Caquetá “even though it does not have the number of inhabitants required by articles 5 and 6 of the Constitution” (Legislative Act 1 of 1981, art. 1), an authorization that was implemented in a matter of months (Law 78 of 1981). It is worth noting that Hernando Turbay Turbay was unanimously elected president of the House of Representatives in the middle of the legislative process, illustrating the way his political career and Caquetá’s recognition
were intertwined (Mojica, 1993). Unsurprisingly, Hernando Turbay became the first senator of the newly recognized Caquetá department.

In conclusion, close study of Caquetá’s integration path confirms that, although livestock farming is the main driver of deforestation in the Colombia Amazon, the transition from subsistence to commercial agriculture was not a “natural” process. The consolidation of a livestock economy in Caquetá was the result of public and private strategies aimed at integrating the region into the market and the state project. High cumulative deforestation in Caquetá is the product of a particular path of integration in which cattle farming was consolidated and partially democratized. Between 1958 and 1982, the basic features of Caquetá’s livestock economy were shaped first by the state and then by the market. This section has provided the basic foundations for understanding how different levels of cumulative deforestation result from different types of integration.

5.4. Putumayo: Integration Through the Extractive Agenda

The previous section focused on Caquetá’s path of economic and political integration and explained its relatively high cumulative deforestation. Given that active agricultural frontiers in the Amazonian piedmont of Colombia do not expand at a similar pace, this section looks at territorial integration in Putumayo, where cumulative deforestation is relatively low. The objective is to complete our study of the critical juncture at which the trajectories of the two departments diverged and explain why cumulative deforestation is more severe in Caquetá than it is in Putumayo. By comparing the two most-similar Amazonian departments in Colombia that nonetheless experience
different levels of cumulative deforestation, I am able to pinpoint the underlying forces that account for more or less expansive agricultural frontiers, and advance an empirically-grounded theory about the different ways in which territorial integration drives deforestation.

I argue that cumulative deforestation in Putumayo is relatively low because the province has not been able to consolidate a legal commercial farming economy. The department’s comparatively less consolidated farming sector is in turn the consequence of a different integration trajectory configured by the Colombian state and the market during the developmental era. While it is true that state intervention promoted both regional development and migration to Putumayo during the developmental era, the state’s strategy in Putumayo differed from its approach to Caquetá in that it promoted the region’s integration through the extraction of oil instead of the consolidation of commercial farming. As a result, by the end of the developmental era, commercial farming was barely consolidated in Putumayo, explaining the department’s relatively low levels of cumulative deforestation.

5.4.1. Integration Through Oil Extraction

Chapter 4 showed that La Violencia was more consequential for Caquetá than it was for Putumayo. Compared to the high levels of violence experienced by Caquetá’s neighbors, which in turn prompted many of their inhabitants to migrate, violence in Nariño, the province from which most of Putumayo’s colonos originated, was significantly lower. In addition, migration to Putumayo in the late 1940s and 1950s was
less connected to the particular political dynamics of *La Violencia*. The varied influence of *La Violencia* consequently affected the strategic calculations of the Colombian state in the Amazon piedmont. Following the 1932 international border dispute, the state re-focused its interests on Caquetá. Putumayo did not become a priority in the state’s agrarian agenda until the beginning of the developmental era: the Caja did not implement state-directed colonization projects in Putumayo during the 1950s the way it did in Caquetá.

Migration to Putumayo between 1951 and 1973 was moderate, while migration to Caquetá over the same period was extensive (see Figures 4.3 and 5.3 above). Although Putumayo’s population increased throughout the twentieth century, the increase proceeded at a relatively slow pace until 1973 (Figure 5.7). While it is difficult to demonstrate exactly why migration to Putumayo did not increase dramatically during this period, I propose that slow population growth was partly the consequence of low levels of violence in neighboring provinces and the state’s accordingly limited efforts to consolidate the rural economy. The state introduced fewer incentives for migration to Putumayo as compared to Caquetá.
Figure 5.7. Population in Putumayo (1928-2005)
Data for population from the DANE.

The economic and political integration of Putumayo was largely linked to the extraction of oil, which was first discovered in the 1940s and extracted beginning in the mid-1960s. The Colombian state completed a road connecting Puerto Asís with Puerto Caicedo in 1957 and then signed a contract with Texaco to facilitate the extraction of Putumayo’s oil. The contract enabled the company to build the necessary facilities and infrastructure. Texaco established its main camp in Santana in northern Puerto Asís, from where the company’s engineers and workers were initially transported by helicopter to extraction sites.

The expansion of the extractive frontier in Putumayo was riddled with conflicts between indigenous peoples, Texaco, and colonos, all of whom laid claim to the land and its natural resources. On the basis of a contract that Texaco signed with the Colombian government, the company began to claim ownership over land that was possessed by
indigenous groups. The Sionas, Cofanes, and Ingas peoples were displaced (CNMH, 2015), and indigenous land was occupied by the oil company and then by colonos eager to benefit from the economic opportunities that Texaco brought. The company, however, did not initially build access roads, thereby obstructing agrarian colonization. Colonos at first used rivers to gain proximity to the company’s investments, including the 150 oil wells it was constructing. Texaco even demanded that the state halt the entrance of colonos into its area of influence (CNMH, 2015).

This initial strategy changed in 1966 when the company built a road connecting Santana with Orito, where most of its oil wells were located. The road facilitated the influx of newcomers seeking employment with the company, or to engage in trade or colonize new land (CNMH, 2015, p. 105). But the allocation of public land to private owners required encroachment on a considerable part of the reserve forest. To that end, the state reduced the boundaries of the reserve in 1966. This change deprived the company of legal tools it had used to prevent the entrance of colonos into its area of influence. Constraints were finally removed from agrarian colonization and the state began to advance an extremely limited agrarian agenda, leading to a moderate increase in population (see Figure 5.7).

Texaco also built a pipeline (oleoducto transandino) to transport Putumayo’s oil to the Pacific Ocean in Tumaco (Nariño). The pipeline was activated in 1969 and its construction promoted the entrance of additional colonos.16 Texaco subsequently constructed a small refinery in Orito and a road connecting this town with San Miguel.

16 The initial goal was to also transport Ecuadorian oil through this pipeline.
These private investments altered the spatial pattern of agrarian colonization as roads became more important than rivers. When it came to infrastructure building, during the developmental era Texaco was, so to speak, the INCORA of Putumayo.

The state thus promoted the expansion of the extractive frontier but did not facilitate the consolidation of agricultural industries. The INCORA, the most important public agency in Caquetá, played no significant role in Putumayo in the 1960s and 1970s. While the regional director of the INCORA in Caquetá was more important than the governor of the intendancy, in Putumayo the INCORA was subordinated to neighboring Nariño, employed very few state officials, and did not maintain a proper branch office as it did in Caquetá (1963). Putumayo’s INCORA was entirely dependent on decisions made in Pasto (interview 50).

Although the state’s agrarian agencies were relatively insignificant in Putumayo, they were not altogether absent. It seems that the INCORA’s activities in Putumayo during the developmental era were limited to the allocation of public land to those colonos who followed the expansion of the extractive frontier. Figure 5.8 depicts the total land area that has been transferred into private hands in Putumayo over time. We observe a peak between 1967 and 1971 following the above-mentioned reduction in the area dedicated to reserve forests. The INCORA intervened to legalize the status of the colonos who had arrived with the extractive boom.
In addition to the allocation of public land, there is evidence that the INCORA issued credit to promote livestock farming in both Puerto Asís and Mocoa (Molano, 1968). The loans were similar to those issued in Caquetá, but their scope was radically different (see Table 5.1 above). An official survey, conducted in the two departments at the end of the 1960s to identify colonos’ needs, found that 53% of Putumayo interviewees viewed credit as an important necessity, while only 7.9% of Caquetá interviewees responded similarly (Medina, 1971, p. 95). Furthermore, according to another official investigation from the time,

Considerable economic efforts were concentrated in the two areas, especially in Caquetá, where numerous loans financed by IBRD were invested, both in the construction of infrastructure and in supervised credits for farming exploitation. By contrast, Putumayo did not receive this type of support, but its inhabitants
requested it before the national government and currently receive some support in credit and technical assistance (Medina, 1971, p. 30).

Despite the relative insignificance of the INCORA in Putumayo, it is worth noting that the agency implemented a project called Putumayo 1 in 1964 (Cabeza, 1971). This project involved the draining of wetlands in order to divide properties and foster agricultural productivity in the upper Putumayo, the part of the region that was already relatively consolidated. The expansion of the agricultural frontier in upper Putumayo was only possible by draining water from the valley (CNMH, 2015, p. 76; Preciado, 2003, p. 117). Apart from this project, to the best of my knowledge, the INCORA did not implement any other colonization projects in Putumayo’s piedmont or planes.

It is difficult to find historical evidence about the agrarian agenda of the state in Putumayo during the developmental era. Generally speaking, secondary sources on the economic and political history of Putumayo are silent when it comes to the role of state agencies like the INCORA (CNMH, 2015; Restrepo, 1985). Nor did my interviewees from the region remember the agency or its bureaucrats. The likely reason for this is that the INCORA did not invest in infrastructure, health, or education in Putumayo as it did in Caquetá (see Table 5.1 above).

5.4.2. Early Contraction and Delayed “Adulthood”

I have argued thus far that the Colombian state shaped the integration trajectory of Putumayo during the developmental era. After the international dispute between

---

17 I found something similar when analyzing the historical archive of Corpoamazonia.
Colombia and Peru and in the absence of pervasive partisan violence in neighboring provinces, Putumayo, once the center of economic and political concern in the Amazon region, ceased to be a strategic priority. This transformation helps us understand why, instead of facilitating the consolidation of commercial farming, the Colombian state promoted the integration of Putumayo through the expansion of the extractive agenda. As a result, at the close of the developmental era, the mining sector accounted for 54% of Putumayo’s GDP (Realpe, 1992). The department’s poorly consolidated farming sector, long neglected by the state, in turn explains its relatively low levels of cumulative deforestation.

The deforestation that did occur in Putumayo was the result of agrarian settlements that cropped up around the main sites of the oil industry. Unskilled labor was required to build oil wells, camps, roads, and the pipeline. However, once this basic infrastructure was built, the demand for local labor rapidly diminished (CNMH, 2015) and the oil economy was unable to absorb additional newcomers. Some left the region, but others decided to remain and cultivate rice, beans, cane, plantains, maize, and yucca. Livestock farming also developed in Putumayo, but it was less widespread and industrialized than in Caquetá. Although farming became an economic alternative to the oil economy, the rural market was poorly consolidated.

Furthermore, the limited prosperity generated by oil in Putumayo soon came to an abrupt halt when the economy was plunged into a crisis in the early 1980s. Figure 5.9 depicts the number oil barrels extracted from Putumayo between 1969 and 1986. We can observe that production declined following its initial peak in the early 1970s. This trend,
along with the discovery of new oil fields in the Casanare and Arauca departments, diminished the relative significance of Putumayo’s oil for Colombia. For example, while Putumayo provided 27% of all Colombian oil in 1975, by 1990 only 3% came from Putumayo (Realpe, 1992, p. 18). Texaco broke its contract with the Colombian state because, the company said, known oil reserves in Putumayo had been exhausted. The company’s departure was premature, however, and the exploitation of oil in Putumayo was later resumed by Ecopetrol (Realpe, 1992, p. 17).

Figure 5.9. Produced barrels of oil in Putumayo (1969-1986)
Data from Devia (2004, p. 83), based on official data provided by Ecopetrol.

Putumayo’s troubled integration trajectory had clear political implications. Full political integration was not achieved during the developmental era, and the province’s recognition as a department was delayed for a decade thereafter. Unlike Caquetá, which was recognized in 1982, Putumayo remained under the direct control of the national government (the DAINCO) throughout the 1980s, becoming a proper department only in 1991, when the Colombian Constitution automatically transformed all “national
territories” into departments. The recognition of Putumayo (again unlike Caquetá) was the result of a top-down process in which regional elites played a secondary role. As a consequence of the 1991 Constitution, Putumayo was granted the right to administer its own resources, democratically elect its governor, and establish additional state agencies (e.g., a comptroller, administrative courts).

In conclusion, this section has argued that state strategies implemented during the developmental era radically altered Putumayo’s integration trajectory. The Colombian state neglected to consolidate commercial farming, instead promoting integration through oil extraction, which in turn incentivized migration, commerce, and agriculture in a cyclical, boom-and-bust pattern. Although the farming sector in Putumayo developed parallel to the oil industry, its scope was limited: few farming products were subject to stable and constant demand. Putumayo’s less expansive and self-sustaining agricultural frontier is one of the consequences of the state’s developmental strategy for the region. During the developmental era the state configured an extractive trajectory with a poorly consolidated legal farming sector. By the early 1980s, when this era came to an end, the most basic features of Putumayo’s trajectory of economic and political integration had already been defined.

---

18 Every “national territory” (i.e., Putumayo, Guaviare, Amazonas, Vaupés, and Guainía) was recognized as a full department in 1991 under the new Constitution. Recognition occurred regardless of the number of inhabitants (Colombian Constitution, transitory article 39; Decree 2274 of 1991).
5.5. Path Dependency in Neoliberal Times (1982-)

This section briefly explores the three most important changes affecting the Amazonian foothills during the neoliberal era, without providing a comprehensive account of them. My goal is simply to provide evidence to support the claim that transformations since the developmental era are less consequential in explaining differential levels of cumulative deforestation in Caquetá and Putumayo. During the neoliberal era, state intervention in the economy changed, coca cultivation and violence increased, and the state’s non-developmental agendas grew stronger in both provinces. However, the impacts of these phenomena differed in Caquetá and Putumayo, respectively, due to the two provinces’ distinct integration trajectories. In what follows, I argue that none of the three neoliberal-era transformations was able to significantly alter the overall integration trajectories configured during the developmental era.

5.5.1. The Withdrawal of the State

The role of the state in Caquetá and Putumayo shifted markedly in the early 1980s as a result of market-oriented reforms: state agencies that were once in charge of supporting agrarian colonization began to withdraw from the active promotion of economic development. However, these national-level developments interacted in different ways with the two provinces’ respective integration trajectories, exerting correspondingly different effects on cumulative deforestation.

Market-oriented reforms in Caquetá negatively impacted the development of the livestock economy. But the state-created agricultural market, configured during the
developmental era, survived under the new circumstances. The INCORA was unable to attract support and funding from the national government to implement its ambitious new colonization project, Caquetá III (1983-1991). As a result, since the 1980s, the INCORA’s functions have been limited to allocating public land, issuing supervised credit, and providing technical assistance (Serrano, 1994). Nor was the INCORA the only public agency to withdraw from the active promotion of the agricultural market. Interviewees still recall the important role once played by the IDEAM, the state agency in charge of acquiring agricultural goods from peasants.

State-led deforestation became market-led deforestation in Caquetá. The consolidation of livestock farming in Caquetá after the developmental era was possible due to the transformation of the market itself. As mentioned above, Nestlé lost its dairy monopsony as regional companies like Trebol began to purchase fresh milk in the mid-1980s (Michelsen, 1990, p. 14). Intermediaries started collecting milk in order to sell it to the big companies. Furthermore, the diversification of the livestock economy contributed to its consolidation: following the developmental era, three legal farming products were produced and exchanged in Caquetá: milk, cheese, and meat. The meat market is dominated by large cattle ranchers who are able to wait long periods of time for their returns.

---

19 It seems that international agencies like the Food and Agriculture Organization (FAO) began campaigning against peasant settlement in the region out of concern for the environment.

20 Small owners save animals and only sell them when problems arise. A small cattle rancher explained that “having a cow is like having a bank account: anyone will buy it” (interview 33).
The most consequential transformation of the neoliberal era was the consolidation of the cheese market. Cheese production is appealing because the product does not perish as quickly as milk, nor does it require cooling. Cheese can resist the high Amazonian temperatures and humidity for long periods, meaning that it can be produced in remote locations far from road networks. Milk production, however, is still safer and more profitable. For this reason, cheese production is regarded as a transitional activity slated for disappearance once the advanced milk market reaches a region. Distance from a major road makes a clear difference, as the fresh milk market is largely dependent on road networks. Although the meat and cheese industries also stand to benefit from better transportation infrastructure, the existence of roads is not a necessary condition of production the way it is for milk (Balcalzar, 1995).

By contrast, the impact of market-oriented reforms and the corresponding withdrawal of the state on Putumayo’s integration trajectory was significantly more damaging. The oil crisis amplified the problems of the agricultural sector when Texaco, the largest company in the region, broke its contract with the government. Furthermore, there was no large-scale investor interested in farming products in Putumayo the way Nestlé invested in Caquetá. The IDEMA and Putumayo’s decanter of liquor, both state agencies, were in charge of acquiring rural products until they were liquidated by market reforms (interviews 12, 57). The reduction of developmental state functions in

---

21 At the end of the 1980s, the state made important investments in infrastructure, which improved Putumayo’s market connections. Until the beginning of the 1990s, the only way to reach Putumayo by road was through its traditional neighbor, Nariño. In 1991 a new road was built to connect Putumayo and Huila. Similarly, a couple of years later, the state built the San Miguel international bridge to connect Colombia and Ecuador (Realpe, 1992).
Putumayo thus made the consolidation of the legal commercial farming sector even more difficult.

In sum, the withdrawal of the state as a vital developmental actor dampened the integration trajectories of both Caquetá and Putumayo. However, given the different pathways configured during the developmental era, commercial farming was able to survive in Caquetá, despite its problems, while in Putumayo the withdrawal of the developmental state ended up deepening the legal farming sector’s enduring problems of consolidation.

5.5.2. Integration Through Coca Cultivation

The withdrawal of the state as a developmental actor in the Amazon coincided, on the one hand, with the escalation of violence and, on the other hand, with the proliferation of coca crops. At first glance, one might consider these factors irrelevant to explaining subnational differences in cumulative deforestation because both have impacted Caquetá and Putumayo alike since the early 1980s. Coca has been grown and cocaine produced in both departments for more than four decades (E. Ciro, 2016). However, while I acknowledge that coca crops have played an important role across the board, I emphasize the importance of regional variation. Although this section does not provide a comprehensive account of the coca question, I offer evidence for an empirically-grounded hypothesis: namely, that the effects of coca crops and violence on cumulative deforestation are mediated by the enduring integration trajectories configured during the developmental era.
Coca helps explain deforestation as both a proximate and an underlying driver (Geist & Lambin, 2002). However, the literature traditionally focuses on the role of drugs as a proximate driver (Dávalos et al., 2011). Forested land is often cleared to cultivate coca, once again reproducing the positive relationship between agricultural development and deforestation (see Chapter 3). As such, the cultivation of coca has been an important driver of deforestation in both Caquetá and Putumayo, although reliable historical data prior to the turn of the twenty-first century is lacking. The cultivation of coca was declared illegal in Colombia and I was told repeatedly by interviewees in both regions that *colonos*, in order to avoid criminal prosecution, cultivate coca away from the main road networks and urban centers, where state authority is relatively strong (interviews 23, 29, 43). Illegality introduces incentives to conceal coca cultivation, thus displacing agriculture to the margins. While the cultivation of coca has incentivized the clearance of forests in both Caquetá and Putumayo, the later has historically had more growing areas than the former (see Figure 6.2).

Coca’s contribution to cumulative deforestation is not limited to this proximate effect, however. I hypothesize that coca cultivation has also acted as an underlying driver, albeit one that is mediated by existing integration trajectories. Our contextualized paired comparison between Caquetá and Putumayo helps illustrate the way coca crops can affect deforestation dynamics by inducing agrarian colonization and aiding the consolidation of legal commercial farming.

One the one hand, coca cultivation engendered an economic boom in both Caquetá and Putumayo that attracted new settlers hoping to grow the cash crop
(Jaramillo, Mora, & Cubides, 1989; Ramírez, 2011; Torres, 2011). Scholars refer to this phenomenon as “coca colonization” (colonización cocalera), that is, a process of agrarian colonization in which the main agricultural product to be cultivated is coca. Although both departments witnessed an influx of newcomers, the total number of migrants differed. Figure 5.10 depicts population growth in Caquetá and Putumayo over time.

![Figure 5.10. Population increase by period and department](image)

Data from the DANE, the author’s calculations.

This figure illustrates that population increased at a higher rate in Caquetá than in Putumayo during the developmental era, providing additional evidence that this period was a path-shaping moment for the Amazonian foothills. The figure also shows that between 1973 and 1985, which I describe as a transitional period, population increased dramatically in Putumayo but only moderately in Caquetá. We can see the effect of coca colonization on deforestation by comparing the 1973 and the 1993 censuses. In two decades, Putumayo’s population increased by 269% while Caquetá’s increased by only
104%. In fact, over the entire period depicted in Figure 5.10 (1938-2005), these two decades represent 60% of the total increase in Putumayo and 46% in Caquetá. Most migrants to Putumayo settled in lower Putumayo, where forest cover rapidly changed (see Figure 5.1). In Caquetá, by contrast, population increase during this period was mostly urban (see Figure 5.2 above).

On the other hand, coca crops also affected deforestation through their influence on legal commercial farming. While coca cultivation facilitated the consolidation of the livestock economy in Caquetá, where the agricultural market was already relatively advanced and democratized, it became the dominant agricultural undertaking in Putumayo. In Caquetá, coca growers have the option of investing in cattle, and cattle ranchers have the option of growing coca. Interviewees explained to me how they were able to inhabit the two markets simultaneously or transition from the illegal to the legal economy (interviews 2, 10, 30, 32). The relationship between legal and illegal economies is very fluid in Caquetá, and even those who specialize in one market must coordinate with their peers in the other market to promote common objectives.

The situation in Putumayo turned out differently because the province had barely consolidated its legal farming sector by the time coca cultivation commenced in the late 1970s. A poorly consolidated farming sector and an extractive economy in crisis

---

22 Unsurprisingly, historians of Caquetá tend to claim that migration decreased during this period due to the interference of illegal activity (Almario Rojas, 1987, p. 25).

23 Milk, coca, and cheese are the three rural products that enjoy an assured demand. However, coca buyers (unlike milk buyers) are able to reach places far from roads and urban centers: coca cultivation is profitable even beyond the agricultural frontier assuming production sites are a reasonable distance from the main markets. Cheese can also be produced at far-flung sites. Given this close connection, coca growers often employ terms that are also used for producing cheese. See Ciro (2016) for a comprehensive study of this connection.
facilitated the proliferation coca cultivation, which quickly became the only rural product subject to constant, stable and unlimited demand. Furthermore, most colonos transitioned from the poorly consolidated legal farming sector to the illegal one (Realpe, 1992). The amount of Putumayo’s agricultural goods that were traded in other departments decreased from 40,751 tons in 1980 to 3,781 tons in 1982, a reduction of 1.078% (Ministry of Agriculture, 1984, p. 30). The cultivation of coca suffocated legal commercial farming by providing a highly profitable alternative. It also helped sustained the region’s remaining population in the wake of the oil bust (interviews 3, 10, 34).

In sum, the cultivation of coca has influenced the economic and political integration of our two departments since the early 1980s. On the basis of empirical evidence, this section proposes that the effect of both coca crops and violence on deforestation dynamics is mediated by the different long-term integration trajectories described in this chapter. In Putumayo the province that was placed on an extractive integration path during the developmental era coca cultivation both promoted mass migration and suffocated the region’s underdeveloped farming market. By contrast, in Caquetá, where integration was promoted through livestock farming, coca crops tended to reduce internal migration and support the existing legal livestock economy.

5.5.3. The Empowerment of the Non-developmental Agendas of the State

The third important transformation of the neoliberal era relates to the empowerment of the non-developmental agendas of the state in both Caquetá and Putumayo. In recent decades, the scope of the state has broadened to include
environmental and ethnic agendas, thereby influencing the integration trajectories of the two departments. Figure 5.11 depicts national parks and indigenous reservations in Caquetá and Putumayo and notes the time period during which they were formally recognized by the state.

**Figure 5.11.** National Parks and indigenous reservations in Caquetá and Putumayo over time


As Figure 5.11 shows, three national parks were established in Caquetá over the last several decades: Picachos (1977), Chiribiquete (1984) and Alto Fragua Indiwasi (2002) and Chiribiquete Park has been enlarged twice since I began writing this dissertation (2013 and 2018). At present, these national parks cover 37% of the Caquetá
department. Similarly, three national parks were declared in Putumayo during the neoliberal era: La Paya (1984), Los Churumbelos Auka Wasi (2007), and Orito Ingi-Ande (2008). These three parks together comprise 17% of Putumayo’s area. In terms of the size of their natural parks, Caquetá and Putumayo were similar until just five years ago, when parks in Caquetá comprised only 14% of the department’s area.

Despite its importance, I propose that the formal recognition of natural parks has not radically changed the developmental-era integration trajectories of Caquetá and Putumayo. The six parks are all well preserved compared to other areas of the two departments.24 On the basis of my data set on land cover, there are also no important differences between parks in Caquetá and Putumayo.

Furthermore, natural parks cannot have influenced variation in levels of cumulative deforestation between Caquetá and Putumayo because they only represent a small part of the total deforested area: just 2% and 3% of the cumulative deforestation in Caquetá and Putumayo, respectively, occurred in natural parks. Most cumulative deforestation has occurred outside of natural parks, suggesting that the decisive factors explaining subnational variation lie elsewhere. Primary and secondary sources on the history of Caquetá and Putumayo rarely mention recognition of natural parks as an important event in these departments’ economic and political history (Artunduaga, 1984; A. Ciro, 2016; CNMH, 2015, 2017).

---

24 The academic literature on the efficacy of national parks emphasizes the difficulty of differentiating the effects of institutions i.e., active protection from the effects of the biophysical characteristics or isolation i.e., passive protection (see Chapter 3).
The ethnic agenda of the state has also increased in strength since the 1980s, a transformation that can be observed in the recognition of multiple indigenous reservations in Caquetá and Putumayo (see Figure 5.11 above). The objective has been to prevent additional displacement and assimilation of the Amazon’s indigenous populations of the sort that occurred during the period when the state actively promoted agrarian colonization (Bonilla, 1968; Friede, 1953; Pineda, 1985). Although indigenous reservations represent only a small part of each department, it bears emphasis that reservations comprise 7% and 22% of the territory of Caquetá and Putumayo, respectively. On the basis of this difference, one might surmise that cumulative deforestation in Putumayo is lower than it is in Caquetá because of the more pronounced role of indigenous reservations.

Although additional evidence is needed to properly test this hypothesis, I do not believe that cumulative deforestation has been significantly affected by the ethnic agenda. Indigenous reservations tend to be less deforested than other types of land in Caquetá and Putumayo; the biggest indigenous reservations in the two departments are isolated from agrarian colonization; and indigenous reservations close to agrarian colonization tend to be small, suggesting that their possible contribution to cumulative deforestation dynamics in the region is minor (see Figure 5.11).

In sum, the developmental era was a path-shaping moment that configured the basic features of the integration paths of Caquetá and Putumayo. This critical juncture left a self-regulating and consolidated market economy in Caquetá and a cyclical and unstable extractive economy with a poorly consolidated farming in sector in Putumayo.
This section demonstrated that these trajectories were amplified and reinforced by the transformations of the neoliberal period. I provided evidence that the retreat of the state from the market, the onset of coca cultivation, and the empowerment of the non-developmental agendas of the state did not radically alter integration trajectories in the Amazonian foothills.

5.6. Conclusion

This chapter examined the transformations of the Amazon piedmont during the developmental era, which I conceived as a critical juncture during which the basic parameters of two distinct integration trajectories were configured, in turn producing differential levels of cumulative deforestation. In particular, the chapter demonstrated how Caquetá and Putumayo began to diverge as a result of the different developmental strategies implemented by the state between 1958 and 1982. I argued that the different levels of cumulative deforestation that characterize Caquetá and Putumayo—both regions with active agricultural frontiers—resulted from the fact that the state promoted commercial farming in the former and extractive development in the latter.

The Colombian state decided to actively promote agrarian colonization and support the consolidation of a livestock economy in Caquetá, which was one of Colombia’s most important colonizing frontiers during the developmental era. Caquetá’s countryside received substantial public investments from state agencies like the INCORA, which were funded by the national government and the World Bank. The integration experience was very different in Putumayo, where the state made minimal
public investments aimed at promoting agrarian colonization and the consolidation of commercial farming. Instead, the Colombian government authorized Texaco to explore, build infrastructure, and extract oil, all of which defined an integration trajectory led by the state’s extractive agenda. As a result of these different state-led strategies, only Caquetá was able to consolidate and to an extent democratize a livestock economy, which in turn explains the department’s high level of cumulative deforestation. Putumayo’s commercial farming sector, by contrast, was left behind.

Although the reasons for these different forms of state intervention are not entirely clear, I hypothesized that an historical explanation needs to consider the strategic interests of the state, which refocused from the external to the internal domain, and from Putumayo to Caquetá, during the first half of the twentieth century (see Chapter 4). In other words, when the state’s primary interest was to ensure territorial sovereignty against the Peruvian encroachment, Caquetá was of relatively less strategic importance than Putumayo, which was a border region requiring defense.

The strategic interests of the state radically changed following the 1932 international war, however. Caquetá quickly became a priority when violence erupted in neighboring departments. The active promotion of both agrarian colonization and commercial farming was part of an ambitious strategy to reduce violence in the Andean core of Colombia and prevent its diffusion to marginal areas like Caquetá. At the same time, Putumayo ceased to be a priority: not only had the international dispute between Colombia and Peru ended, but the level of violence in Putumayo’s immediate vicinity was relatively low. As such, migration to the region and the risk of diffusion were
correspondingly insignificant. The lack of a more ambitious development strategy to support agrarian colonization in Putumayo was, I suggest, a result of the shifting strategic interests of the state.

By the early 1980s, the two Amazon departments exhibited the basic characteristics of two distinct types of integration: while Caquetá was integrated through the expansion of livestock farming, Putumayo was integrated through the expansion of the extractive frontier. I have argued that the basic features of these integration trajectories did not significantly change during the neoliberal era. Rather, they were reinforced by consequential phenomena like the withdrawal of the state as a developmental actor, the entrance and proliferation of coca crops, and the strengthening of the non-developmental agendas of the state. Therefore, path dependency best describes historical transformations since the end of the developmental period.
CHAPTER 6. DIVERSE LEGACIES IN THE AMAZONIAN FOOTHILLS

6.1. Introduction

This chapter represents the last of three steps in a contextualized paired comparison between Caquetá and Putumayo, the Colombian Amazon’s two most developed and populous departments that nonetheless display starkly different patterns of historical and contemporary deforestation. Chapters 4 and 5 focused on a path-shaping period, the developmental era, to illustrate the similarities between Caquetá and Putumayo until the mid-1950s, when their economic and political integration paths and corresponding levels of deforestation began to diverge as a result of differential state intervention. While Caquetá consolidated a relatively democratized farming system by the end of the developmental era, Putumayo was integrated into the Colombian economy through oil extraction, which did not lead to the consolidation of a farming economy. As a result of this initial divergence, factors like the introduction of coca crops generated different effects in the two regions during the 1980s. Coca crops became a complementary and transitional product in Caquetá, and a dominant one in Putumayo.

This chapter continues the paired comparison by exploring the legacies of the developmental era that go beyond the limited horizon of utilitarian economics. Certainly, the objective of this chapter is not to provide a complete narrative of contemporary transformations in the Amazonian foothills, which remain exceptionally dynamic because the peace process between the Colombian government and the FARC is very recent. Instead, my goal is to lay out some of the most salient political and cultural
characteristics of Caquetá and Putumayo, and explain why these features are entrenched legacies of the developmental past.

Studying these legacies is vital to understanding not only the continuity of cumulative deforestation over time but also the relative inefficacy of state policies designed to stop it. By focusing on their most salient and enduring features, scholars and practitioners can better understand the spatial patterns of deforestation in post-conflict Colombia. The FARC was once very influential in both Caquetá and Putumayo, where it constrained the development of the farming economy. However, the effects of the FARC’s demobilization on deforestation have been uneven. Unsurprisingly, Caquetá is, among the cases studied, the province with the highest rates of deforestation since the withdrawal of the FARC. Putumayo, by contrast, experienced relatively low levels of historic and contemporary deforestation despite being impacted by the FARC. In order to understand the contemporary dynamics of forest loss in the Amazonian foothills, I argue, we must consider the interaction effect between historic integration trajectories, their contemporary legacies, and the demobilization of the FARC.

The aim of this chapter is not to test but to generate an empirically-oriented theory that accounts for different levels of cumulative and contemporary deforestation and takes into consideration the role of history. To this end, I provide and compare thick descriptions of contemporary Caquetá and Putumayo with the aim of generating a set of hypotheses that can be tested in the future. This chapter is therefore a preliminary effort to explain subnational differences in Amazon deforestation.
The chapter consists of four parts. The first part explores transformations in the Amazonian foothills following the peace process between the Colombian government and the FARC. It highlights the importance of both temporal and spatial differences when it comes to explaining the dynamics of deforestation and the influence of the FARC’s demobilization. The second part of the chapter focuses on the political economy of the environment in Caquetá and Putumayo as a window into the markedly different political interests and actions in the two regions. The third part looks at the most salient cultural legacies affecting contemporary dynamics of deforestation in the Amazonian foothills. I then summarize my argument in a brief concluding section.

6.2. Current Environmental Issues in Caquetá and Putumayo

The demobilization of the FARC has facilitated the expansion of agricultural and extractive frontiers in Caquetá and Putumayo. However, the speed and scope of change has varied according to the particular type of integration. While most existing academic literature emphasizes temporal transformation—that is, before and after demobilization—I argue for the importance of spatial differences as well, to the degree that they reveal the legacies of the past. Figure 6.1 illustrates two of the most salient environmental issues in Caquetá and Putumayo today, which relate to the expansion of the agricultural and extractive frontiers.
6.2.1. The Expansion of the Agricultural Frontier

Deforestation has increased in Caquetá and Putumayo in parallel with the most important successes of the peace process. However, following the demobilization of the FARC, deforestation increased far more rapidly in Caquetá than in Putumayo: between 2015 and 2017, deforestation increased by 177% and 98% in Caquetá and Putumayo, respectively (see Figure 6.2 below). In addition to this uneven rate of increase, the overall magnitude of deforestation is much greater in Caquetá as compared to Putumayo, and most *Terra-i* deforestation alerts pertain to the Caquetá department (see Figure 6.1)

*Figure 6.1. Most salient environmental issues in the Colombian Amazon foothills Data for hydrocarbons from ANH (2018), for deforestation alerts from CIAT (201), for primary and secondary roads from IGAC (2016) (co-authored with Nicolás Herrera).*
Contemporary explanations that emphasize the role of the FARC are incomplete insofar as they fail to recognize that the guerilla organization was once very influential in both departments. If the withdrawal of the FARC were the main driver of deforestation, we would observe equally rapid deforestation in both departments. Why is post-conflict deforestation less intense in Putumayo than in Caquetá?

On the basis of my fieldwork and official data, I argue that the impact of the demobilization of the FARC can only be understood in relation to the regions’ enduring integration trajectories (see Chapters 3 and 5). The demobilization of the FARC has accelerated deforestation in regions like Caquetá, where the legal farming system was already consolidated due to a particular type of integration based on commercial farming. Conversely, post-withdrawal deforestation has been relatively less intense in regions like

---

1 There have been some deforestation alerts for Putumayo as well. However, they tend to come from the north of the department, specifically the municipalities of Puerto Guzmán and Puerto Leguizamo, into which Caquetá’s deforestation path has expanded.
Putumayo, where the consolidation of legal farming is still in its infancy. The crucial relationship between historic integration trajectories and contemporary transformations in Caquetá and Putumayo can be appreciated by considering two proximate drivers of deforestation: coca crops and livestock farming.

In addition to forest loss, Figure 6.2 above depicts the land area dedicated to coca cultivation in the two departments over the last decade. Part A of the figure provides vital evidence for the proposition that coca cultivation is not the main proximate driver of deforestation in Caquetá: although coca cultivation has certainly increased in the last three years—from 7.7 to 11.7 thousand hectares—the change in the magnitude of deforestation was much larger—from 22.3 to 62.1 thousand hectares. Even assuming that each hectare of coca cultivation required land clearance, the total amount of cultivated area in 2017 would only account for 19% of the cleared land in the same year. Something very different took place in Putumayo (Part B), where annual forest loss and illegal cultivation increased by similar magnitudes and at comparable rates: cleared forests increased from 13.1 to 26.2 thousand hectares, while coca cultivation increased from 20 to 29 thousand hectares. Although Caquetá and Putumayo both experienced deforestation without coca cultivation and coca cultivation without deforestation, Figure 6.2 suggests that coca crops were the dominant driver of deforestation in Putumayo but not in Caquetá.

On the other hand, the opposite is true when we look at cattle ranching, which the literature identifies as an important proximate driver of deforestation (see Chapter 2). Figure 6.2 also provides aggregate data on the number of animals in Caquetá and
Putumayo over the last decade, from which we can infer that cattle has been the main
driver of deforestation in Caquetá, but not in Putumayo. The number of animals in
Caquetá has markedly increased in the last four years—from 1.35 to 1.8 million
animals—whereas the increase in Putumayo has been minor—from 203 to 255 thousand
animals. Only in Caquetá does increasing deforestation coincide with an increasing
number of animals. The impact of the FARC’s withdrawal was thus mediated by the
preexisting degree of consolidation and democratization of the farming system, which
was largely shaped during the developmental era.²

6.2.2. The Expansion of the Extractive Frontier

I end this section by emphasizing that both the agricultural frontier (legal and
illegal) and the extractive frontier have progressed in the Amazonian foothills in parallel
with the peace process. Figure 6.1 above illustrates that oil production is exclusively
concentrated in Putumayo and non-existent in Caquetá. The figure thus provides a visual
representation of the different types of integration trajectories I described in the previous
chapter. After the developmental era, the number of oil wells has only gradually
increased in Putumayo.

However, the sharp difference in terms of active oil production is steadily
changing due to state promotion of the extractive agenda. The figure shows that most
area in the Amazonian foothills of both Caquetá and Putumayo is currently available and

² The previous chapter explained that by consolidation I mean the existence of a constant, safe and stable
demand for farming products.
under evaluation or exploration. Nevertheless, the prospect of oil extraction carries different implications for the two departments. The expansion of extractive industry in Caquetá would be a fundamental change with the potential to radically transform its enduring integration trajectory. Conversely, the same changes in Putumayo would be better conceived as incremental: instead of profoundly transforming the integration path of the region, additional oil extraction would likely reinforce its historical trajectory. The next section of the chapter examines the political economies of oil and deforestation in the Amazonian foothills and defends the significance of developmental-era legacies.

6.3. The Political Economy of the Environment in the Amazonian Foothills

There have been both changes and continuities in deforestation dynamics since the demobilization of the FARC. Most studies and journalistic accounts focus on temporal, rather than spatial, variation and emphasize change over continuity. I argue that Amazon deforestation after the peace process has been spatially uneven and that such unevenness is the product of divergent integration trajectories and their enduring legacies. In this section, I explore one of those legacies, the political economy of the environment, and conclude that Caquetá and Putumayo represent two distinctive dominant political economies.

The dominant political economy of each department, I argue, is comprised of two related but independent sets of political interests and actions: those related to Amazon deforestation, which is driven by agrarian colonization (legal and illegal) and cattle ranching, and those related to the extraction of oil. The next sections offer a preliminary
characterization of the two provinces’ dominant political economies, which I consider enduring legacies of the developmental era.

6.3.1. The Political Economy of the Environment in Caquetá

In addition to the expanding economic rationale for Amazon deforestation in Caquetá, I propose that this department has, over time, developed a dominant political economy of the environment. This characteristic political economy is one of the entrenched legacies of an integration path that was largely based on commercial farming and that was constrained until the demobilization of the FARC. I provide evidence for the claim that in provinces like Caquetá an anti-deforestation agenda solely focused on enforcement tends to attract few local allies, whereas opposition to large-scale extractive industries tends to be unified and radical. To illustrate this claim, I briefly reflect on the role of the environment in relation to (a) political interests, (b) institutionalized politics, and (c) dynamics of contention.

(a) Political interests. On the basis of my own interviews and observations of political events and episodes of contention in Caquetá, I argue that most people in the department are interested in promoting farming development, which implies misgivings about anti-deforestation policies that do not take those interests into consideration, as well as opposition to the advancement of the oil industry.

First, many people in Caquetá are interested in promoting the development of a regional economy that is mostly based on livestock farming. Sectoral alliances are
possible because both elites and non-elites benefit to some degree from cattle ranching. Livestock production is not entirely concentrated into a few hands.

The consolidation of livestock farming in Caquetá brought with it a measure of democratization. Figure 6.3 below, based on the 2018 official inventory of cattle, illustrates the relative importance of small and mid-size farms in Caquetá. Compared to Putumayo, where slightly more than 80% of the farms are small—between 1 and 50 animals—mid-size and large farms in Caquetá are relatively significant. On average, a cattle farm in Caquetá has 108 animals, while in Putumayo the average is 33 animals. The official data on land inequality for 2014 offers a complementary picture. Although rural properties are on average larger in Caquetá than in Putumayo, land inequality is lower in the former: the Gini coefficient is 0.59 in Caquetá and 0.74 in Putumayo (UPRA, 2016, p. 15). Therefore, compared to Putumayo, farms in Caquetá are larger and the total area of properties is better distributed among land owners and holders.

---

2 A farm in Caquetá is 72.6 hectares on average, whereas in Putumayo the average is 15.5 hectares. In addition, 80% of Caquetá’s farms are smaller than 90.1 hectares, whereas 80% of Putumayo’s farms are smaller than 20 hectares (UPRA, 2016, pp. 258, 437).
Figure 6.3. Farms by number of animals in Caquetá and Putumayo (2018) Data on livestock from the ICA.

However, it is important to recognize that elites tend to benefit more than non-elites and that important partisan cleavages divide cattle ranchers. Caquetá has two established associations of cattle ranchers: a right-wing cattle association in Florencia and a left-wing one in San Vicente del Caguán (Vásquez, 2015). Although these organizations have many disagreements and compete against one another electorally, their differences vanish when it comes to defending the interests of Caquetá’s cattle economy. While these associations rarely coordinate, they pursue similar goals across geographical and political differences. Sectoral interests tend to be more consequential than political, geographical, and other social cleavages.

I arrived at this conclusion by asking cattle ranchers and representatives of the two associations for their opinions about Nestlé, the multinational company that operates in the department. The answers I received were not radically different because both
associations value the social role of the company in the generation of income. Sectoral interests also come into play when actors demand developmental policies and state investments in, for example, road networks, electricity, technology, and land titles. An important part of the peace agreement between the Colombian government and the FARC is the participatory elaboration and implementation of Territorially Focused Development Plans in regions that were severely impacted by the war. To this end, from the second half of 2017 through 2018 the Colombian government held meetings in Caquetá to hear the demands of approximately 12,922 participants (ART & Presidency, 2019). I had the opportunity to attend some of these meetings, where I observed how people in Caquetá, regardless of partisan allegiances, demand the provision of basic public goods such as roads, electricity, land titles, education, and health—i.e., investments necessary to promote the farming sector and the local economy.

For example, in May 2016 I participated in a town meeting that was organized in San Vicente del Caguán. During the meeting locals repeatedly complained about “state abandonment” and the poor provision of roads, electricity, health, and education. Over the course of three hours, not one participant mentioned the environmental consequences were such demands to be satisfied. The issue was only broached at the very end of the meeting, when an indigenous woman rose to critique state policies that promote the advancement of the cattle frontier. Despite the fact that environmental protection was not a salient concern, participants voiced their discontent with the entrance of the oil

---

4 Moderate critiques are emphasized by the northern left-wing association (interviews 15, 20).
5 A demand for investment projects and state support in exchange of voluntary substitution of coca crops was an important part of these meetings.
industry. State investments have yet to be allocated, but the official account of these meetings, published in January 2019, confirms my observation that participants overwhelmingly demanded infrastructure and farming development (ART & Presidency, 2019).

The academic literature finds that Amazon deforestation in Colombia mainly results from agrarian colonization—whether legal or illegal—and cattle ranching (Armenteras, Rudas, Rodriguez, Sua, & Romero, 2006). Unsurprisingly, anti-deforestation policies in departments like Caquetá are usually perceived as threats to the development of the farming sector. For that reason, they tend to be advanced by national or international environmental agencies, non-governmental organizations, courts, university professors, students, and the press, all of which are remote from local demands for the expansion of the agriculture and extractive frontier.

Environmental agencies have been implementing different projects to promote “livestock conversion.” Interviewees recalled that the government of Caquetá implemented an ambitious project in 2014 aimed at intensifying the use of cleared land through education, technological investments, and the introduction of silvopastoral systems. The former governor of Caquetá, a member of the Christian political party MIRA, led the initiative and enlisted two national non-governmental organizations in its implementation (Arco Irís and Misión Amazonia). Despite their political differences, Caquetá’s two cattle associations both severely criticized the project on the grounds that they had been excluded from its design and implementation, a fact they perceived as a direct challenge to their basic demands. The project continued without input from the
livestock associations, which were aligned in terms of their sectoral interests rather than their partisan and geographical identifications.

Local opposition to anti-deforestation initiatives contrasts markedly with the overwhelming negative response to the encroachment of the oil industry. A powerful environmental movement has emerged in Caquetá in response to the recent advancement of the extractive agenda. Since 2014, a number of oil companies have received authorization to implement seismic studies, which do not require social participation or environmental licensure. To this end, oil companies have arrived in the region in parallel with the advancement of the peace process between the Colombian government and the FARC.

Residents of Caquetá clearly oppose the introduction of oil companies, and their reasons are diverse. Some have adopted an environmental discourse, which recognizes that Caquetá is part of the Amazon and emphasizes that water is more important than oil for life. “Water, not oil” is now a common expression in Caquetá. The defense of clean water has become an end in itself as well as a means to protect public health, guarantee access to food, and maintain the productivity of farming. In addition, some residents articulate related concerns that are not strictly environmental. It is argued, for instance, that oil extraction incentivizes both the presence of the army—a serious problem for those who cultivate coca crops—and violence between the state and the guerrillas. Some also express fear of losing their informally held lands, as many peasants and ranchers do not have legal title, making it possible for the state to allocate their lands to the oil
companies. Lastly, others express the concern that oil extraction would promote massive migration and thereby disrupt local practices.

Opposition to extractive industries is thus diverse. To promote the coordination of the various interests opposed to the oil industry, local leaders organized the Mesa Departamental por la Defensa del Agua y la Vida in 2010. The main achievement of this alliance, according to one of its leaders, has been to insert the debate about oil extraction into Caquetá’s political agenda.

(b) Institutionalized politics. Political interests concerned with the environment have exerted influence on institutionalized forms of politics. Given the historical trajectory of Caquetá, which was based on commercial farming, it is highly unpopular to oppose livestock farming and defend the implementation of environmental laws. By contrast, it is very popular to oppose the extraction of oil. Given this political context, few politicians harshly critique cattle ranchers and openly defend the entrance of the oil industry. Cattle ranchers tend to be vital players as elected officials, candidates, and voters, even as they remain divided along partisan lines. Electoral campaigns tend to reflect a broader context in which it is not strategic to emphasize the negative consequences of cattle ranching.

Politicians, then, have strong incentives to criticize anti-deforestation policies. Avoiding the topic of deforestation or justifying the problem tends to be politically beneficial. As an illustration, consider the political forum organized by the Universidad de la Amazonia during the 2018 Congressional race. Asked to identify the most important environmental problems facing the department, all candidates initially agreed that the
advancement of the oil industry was the most pressing concern. Deforestation was addressed only after a student raised the issue. It was a difficult question that candidates hoped to avoid in the first place. Despite partisan differences, however, answers to the question were remarkably similar: candidates recognized the environmental challenge but strongly defended cattle ranching. For instance, Óscar Conde, a left-wing candidate and well-known lawyer, answered the question by drawing an explicit connection to the advancement of the oil industry. Conde said:

> Now they are telling us that, since peasants already deforested the region, oil companies are now allowed to destroy it. If I have to choose between peasants and companies, I am clear: I choose peasants and not the oil aggression.

The quote is instructive for the way it illustrates, first, how even leftist politicians tend to defend livestock farming and, second, the strategic importance of criticizing the oil companies. Both right-wing and left-wing politicians voice support for cattle ranching and opposition to oil extraction. The left emphasizes the opportunism of right-wing politicians who oppose oil extraction in Caquetá and support it in Bogotá, the capital city of Colombia. However, even if right-wing politicians do not genuinely oppose oil extraction, their double strategy is revealing of the unpopular reception of oil companies in Caquetá. Different participatory mechanisms have been promoted to voice local discontent with the entrance of the oil companies.⁶

(c) Dynamics of contention. Needless to say, political conflicts related to environmental issues in Caquetá are not always handled through institutional channels.

---

⁶ Environmental activists are using varied institutional mechanisms to voice their disagreement: signatures are being gathered, annual parades organized and consultation processes promoted (Caro, Aristizábal, & Ciro, 2019; Gómez & Harman, 2014).
Open confrontation between local populations and state authorities has increased since the demobilization of the FARC, and part of this dynamic of contention has to do with environmental politics. Briefly, I provide some examples that illustrate how local populations in Caquetá have actively rejected both anti-deforestation policies linked to law enforcement and the sustained advancement of the extractive frontier.

Residents of Caquetá rarely mobilize against deforestation. Instead, they tend to complain about state policies designed to address deforestation by simply enforcing environmental laws and about the militarization of the environment. A telling episode occurred in San Vicente del Caguán in October 2018. A judge in Medellín, in northern Colombia, ordered the police and the Office of the Attorney General to arrest five ranchers and confiscate their cattle because their farms were located inside Picachos National Park, where ranching is prohibited by law. It was a massive operation that required the deployment of many police, judicial personnel, and trucks. To my knowledge, it was the first operation of this magnitude in the Colombian Amazon, although the incarceration of local populations is steadily increasing.

Unsurprisingly, while the judiciary, the army, and environmental activists celebrated and justified the operation, locals largely complained about it. Residents conceived the military operation as a direct challenge to their way of life: “We are asking them to release my father... the second thing we ask is that they give us the confiscated cattle, and the last thing is to give us the land title. We, as peasants, demand to sit down because we have been there for more than thirty-five years” (Lente Regional, 2018).
To resist the police action, people in San Vicente del Caguán engaged different strategies of contention: they destroyed community-built roads (see Figure 6.4 below), erected roadblocks, marched, and sent letters to the relevant judicial and environmental agencies (Asociación Nacional de Zonas de Reserva-ANZORC & Asociación Campesina Ambiental Losada-Guayabero-ASCAL-G, personal communication, October 29, 2018).

For the locals, the fact that the state was simultaneously promoting the entrance of oil companies into the department raised doubts about the motivations behind the state’s anti-deforestation policies. One political leader in Caquetá concluded that the operation’s true objective was not to protect the environment “because multinational oil companies are being allowed to destroy our territory” (A. Mayorga, personal communication, October 27, 2018). Given the parallel progress of the two agendas in the region, opposition to anti-deforestation policies tends to be justified by highlighting the state’s hypocrisy when it comes to environmental protection. The relevant question, according to local leaders, is not so much whether environmental exploitation is allowed by the state but which actors are legally permitted to engage in it.
In addition to actively mobilizing against the enforcement of anti-deforestation laws, people in Caquetá have actively protested the entrance of the oil industry. Locals have physically blocked the roads and bridges used by oil company personnel to conduct their exploratory studies (Ciro, 2018). Due to the persistence of these protests, oil company activities in Caquetá are now facilitated by police action to open roads and bridges by force. Consultation with locals is not required by law because oil exploration occurs not on indigenous reservations but on privately-held land whose legal status is not always recognized by the state. These localized conflicts between ranchers, peasants, companies, and the police also extend to the capital city, where regional discontent is expressed through at least an annual demonstration. Every year since 2012, protestors have marched in opposition to the entrance of the oil industry. Thus far, these marches have not resulted in open confrontations with the police.

In sum, the expansion of agricultural and extractive frontiers has accelerated in Caquetá since the demobilization of the FARC. This section has provided some evidence
illustrating how Caquetá’s population tends to reject state policies aimed at containing the farming frontier and advancing the extractive frontier. Residents of the department prefer the opposite: that is, policies to promote agricultural development and contain the advancement of the extractive frontier. This basic disagreement over developmental strategies in Caquetá has impacted both institutionalized and contentious politics. On the basis of this evidence, I hypothesize that provinces like Caquetá, which were integrated via commercial farming during the developmental era, are likely to exhibit this same political economy of the environment in the present.

6.3.2. The Political Economy the Environment in Putumayo

Putumayo has also configured a dominant political economy of the environment, one that is a legacy of an integration trajectory based on the production of oil. I previously showed that deforestation has increased at a slower pace in Putumayo than in Caquetá since the demobilization of the FARC. For this reason, Putumayo has not been an important target of anti-deforestation debates and policies. The contemporary political economy of the environment in this department revolves around two issues: the expansion of the extractive and coca-growing frontiers. Unlike in Caquetá, opposition to the expansion of the oil industry in Putumayo is fragmented, and opposition to anti-deforestation policies tend to be moderate. In what follows, I briefly describe the department’s dominant political interests and actions.

(a) Political interests. The fact that Putumayo was integrated through the extractive agenda of the state configured a political economy of the environment that
differs markedly from that of Caquetá. Political interests vis-à-vis the exploitation of oil are diverse, and opposition to extractive activity is fragmented. Put differently, the farming sector in Putumayo, consisting of elites and non-elites, is not united with respect to extraction: many local populations benefit, directly or indirectly, from the oil industry.

The income of many families in Putumayo depends on the active production of oil. The extractive path of integration promoted the migration of *colonos*, whose labor enhanced the regional economy. Camps were formed close to the oil wells, and some of them became urban centers over time. Locals work for oil companies or invest in hotels, parking lots, bars, and means of transportation. In times of crisis the vital role of oil exploitation in Putumayo becomes even more evident. A former director of the Chamber of Commerce explained that approximately 200 tank trucks left the region during the 2014 oil crisis, precipitating a deep economic recession in the department (interview 55). The crisis could be seen on the streets of Puerto Asís during Christmas: few lights were up and running during the crisis. “It was a dark Christmas” remarked a local merchant (interview 55).

Next to oil extraction, cocaine production is the second most significant economic activity when it comes to environmental politics in Putumayo. Based on my interviews in the region, I observed a sharp mismatch between the interests of national state agents and local populations: while the state emphasizes the negative consequences of cultivation (deforestation) and oil production (industrial pollution), people in Putumayo criticize the implementation of a drug policy that relies on aerial spraying. The opposite is also true: people in Putumayo tend to deny or justify the environmental consequences of cultivation
and oil production, and the state does something similar in defense of drug policy. This disagreement suggests that environmental issues are often strategically mobilized to frame other political demands.

Despite this conflict between residents of Putumayo and the Colombian state, it is worth noting that the coca-growing population has demanded state presence in Putumayo rather than completely rejecting it (Ramírez, 2011). People in the countryside have self-organized to provide for their own needs, which is insufficient when the scale of the demanded investment is large (Torres, 2011). In such cases, residents demanding state investments argue that both the substitution of coca crops and the protection of the environment are possible.

(b) Political action. Neither public interest in preventing deforestation nor discontent with the implementation of anti-deforestation policies have, to my knowledge, resulted in episodes of contention in Putumayo. However, we should view deforestation debates in light of public and private actions related to oil extraction and drug policy.

Social protests associated with oil extraction in Putumayo are frequent. Unlike in Caquetá, however, the opposition to extractive industry in Putumayo is fragmented. For this reason, I suggest viewing episodes of contention related to oil extraction in Putumayo as distributive conflicts. Interviewees mentioned many protests in which locals complained about one of the most important negative externalities of oil production: water pollution. The impact of oil production on the quality of water has to do with technical problems or oil spills caused by guerrilla warfare. People tend to protest the oil companies even when they acknowledge that “third parties” caused the oil spill.
Residents of Putumayo demand the rapid and complete cleaning of the affected area, a task that oil companies do not often perform to local satisfaction.\(^7\)

Furthermore, I heard many stories of residents protesting both the negative externalities of oil transportation and proposals aimed at modifying the status quo. Putumayo’s oil is today transported to the Pacific through a pipeline built during the developmental era and to the north through tank trucks along the secondary and tertiary roads of oil-producing municipalities. For example, people in Puerto Asís have criticized the way tank trucks not only damage the roads but also produce unhealthy dust. As a result of these conflicts, many companies have improved roads and employ water to keep dust settled in affected residential areas. However, the necessity of tank trucks has resulted in a local economy characterized by the use of parking lots, hotels, restaurants, bars, etc. The suppliers of these services tend to be part of the regional elite. This picture makes it easier to understand why people in Putumayo rarely demand the end of oil exploitation or transportation. Interviewees recalled local discontent when one company expressed interest in building a new pipeline that would obviate the need for existing transportation infrastructure.

We should not conclude from the above that radical opposition to the expansion of the extractive frontier is absent from the region. In fact, indigenous groups lead a strong opposition movement whose concerns have been loudly voiced in municipalities like Puerto Asís and Villagarzón. There are also cases like that of Puerto Guzmán, where

---

\(^7\) Radicals invoke these negative experiences to defend the importance of actively opposing the expansion of the extractive frontier.
Colonos have opposed oil extraction. For this reason, my claim is not that radical antagonism to the oil industry in Putumayo is non-existent, only that the opposition is highly fragmented: as I have illustrated, some actors support extractive industries, some benefit from the status quo, and some hope that a better balance of interests will be achieved.

It is worth noting that political elites and state agents were deprived of concrete incentives for supporting the extraction of oil after 2011, when the Colombian Congress reformed the mechanism for allocating royalties from oil. Prior to the reform, which centralized resources and regulated their allocation, state agents had a clear incentive to facilitate the expansion of the extractive frontier. However, the fact that state agents lost these incentives does not necessarily mean that they oppose oil extraction.

In addition to oil exploitation, social mobilization in Putumayo also revolves around the "war on drugs." Coca crops promote deforestation and cocaine production pollutes water and soil because peasants use chemicals like hydrochloric acid and acetone. Most social contention in Putumayo is directed against the implementation of a drug policy based on the aerial spraying of glyphosate. This conflict recently dropped off after Colombia decided to suspend the use of aerial spraying in 2015. The state’s drug policy shifted from aerial fumigation to a combination of forced eradication and voluntary substitution.

---

8 The aerial application of glyphosate is usually resisted by local populations because it not only affects their income but also damages health, legal farming activities, water, forests, flora, and fauna (Ciro, 2016; Ramírez, 2011).
Peasants tend to be the main political actors in these contests. In the absence of a strong legal farming sector, Putumayo did not see the emergence of a rural economic elite capable of influencing state power. It has for this reason been argued that territorial control tends to be more important than land ownership in Putumayo (CNMH, 2015). For a long time, peasants in Putumayo have expressed a willingness to replace their coca crops were the state to prove an economically viable alternative (interview 23). The challenge for the state is finding an alternative that is comparable to coca cultivation in economic terms and environmentally friendly at the same time.

In sum, this section has proposed that Caquetá and Putumayo have different dominant political economies of the environment, which are in turn legacies of the past. Caquetá, the province with higher and more rapidly increasing rates of deforestation, tends to oppose the expansion of the extractive frontier, favor the advancement of the agricultural frontier, and thus critique anti-deforestation policies with the potential to negatively affect their economic interests. In Putumayo, conversely, the expansion of the extractive agenda encounters fragmented opposition and few critique anti-deforestation policies whose objective is to constrain the advancement of the legal agricultural frontier.

6.4. The Moral Economy

The second legacy analyzed in this chapter pertains to the dominant moral economies of the two regions of interest (see Chapter 3). I interpret those distinct moral economies as legacies of the two departments’ historic integration trajectories. During my fieldwork in the Amazonian foothills of Colombia, I came to understand the importance
of the non-utilitarian values associated with the economic dynamics that, in turn, explain different levels of cumulative deforestation. Between 2016 and 2017, I had the opportunity to participate in public events where I encountered the official symbolism of the two departments: anthems, coats of arms, and flags. Most of these symbols were designed by school teachers and then recognized as official by local state authorities. On the basis of these initial observations, I concluded that a systematic study of official symbolism would usefully illustrate the sharp cultural differences between Caquetá and Putumayo that help explain their differential levels of deforestation.

On the one hand, official symbolism can be understood as an observable manifestation of a region’s most important identity features. On the other hand, it also works to actively configure and reproduce that identity. Such symbols tend to be an important part of everyday state rituals. Coats of arms are printed on government letterheads, emblazoned on official uniforms and vehicles, and displayed at state-sponsored events like fairs, festivals, and beauty contests. Similarly, anthems are played at the beginning of almost every public event and used as pedagogical tools to promote regional identity at schools.

I therefore collected the anthems, coats of arms, and flags of every municipality in Caquetá and Putumayo, as well as the symbols of the governments of the two departments. My goal was to systematically decode and analyze the messages conveyed

---

9 It is worth emphasizing that these symbols depict an exaggerated version of history. From the inclusion of indigenous peoples, one cannot conclude that a society is inclusionary.

10 In fact, I collected official symbols for the entire Amazon region in Colombia, most of which are not included in this dissertation.
by official symbolism. To this end, I consulted different sources of information: local
development plans and the official websites. Although I collected coats of arms,\textsuperscript{11}
anthems, and flags, I focus less on the flags because their meanings were too general.\textsuperscript{12}
My analysis of these official symbols followed the general protocols of content analysis. I
was mostly interested in understanding if a symbol recognized particular actors (\textit{colonos}
or indigenous groups), specific economic activities (farming or oil extraction), and the
role of “progress” or “development.” I coded each symbol on the basis of these factors.

While the remainder of this section emphasizes the differences between Caquetá
and Putumayo, it is necessary to highlight one powerful similarity. Official symbolism in
the Amazonian foothills of Colombia does not depict battles against oppressive powers
(revolutions), global empires (decolonization), or other foreign enemies (external wars).
Instead, it illustrates a harsh battle against nature, a battle that \textit{colonos} fought and won
through bravery and exertion. The official symbols of the two provinces celebrate
agrarian colonization, which I interpret as creative destruction. As I illustrate, however,
the symbolism tends to emphasize creation over destruction (see Chapter 3).

6.4.1. The Dominant Moral Economy of Caquetá

While Caquetá and Putumayo were born out of twentieth-century agrarian
colonization, only Caquetá was able to build a ranching economy and culture. The

\textsuperscript{11} Coats of arms use very few words to convey their messages, but they usually contain the basic
components of the founding myth of a region. As with most regions of Colombia, Caquetá and Putumayo
follow the European rules of heraldry.

\textsuperscript{12} It is worth mentioning, however, that flags employ the color green for nature, forests, pastures, and
swamps (\textit{canaguchales}); blue for rivers and skies; white for peace; yellow for enlightenment; and red for
either blood or hard work.
historical trajectory of Caquetá has additionally configured a dominant moral economy that is deeply linked to agrarian colonization and cattle ranching. Any explanation of Caquetá’s high cumulative deforestation should consider the way culture and non-utilitarian values affect the market economy (see Chapter 3).

At present, state agencies like the IGAC and IDEAM conceive the mass transformation of forests into pastures as a land-use conflict because land is being used for unsustainable purposes (IGAC, 1993, 2014). However, based on my interviews in the region, I believe the idea of a land-use conflict fails to capture the complexity of the problem. I argue, instead, that the so-called land-use conflict is in fact a conflict between two visions of the land’s “vocation.” While the IGAC argues that forestry is the vocation of Caquetá, locals tend to believe that the vocation of the region is cattle farming. My interviews with cattle ranchers, peasants, and political leaders revealed that I was asking questions about the very foundation of the region, its history, economy, and identity. Although interviewees agreed that forest loss is a serious environmental concern, most of them justified it for particular reasons. Interviewees tended to believe that Caquetá’s vocation is both agrarian colonization and cattle farming.

In order to systematically explore the ideas conveyed by my interviewees, I collected and analyzed official symbols in order to determine whether they explicitly represent colonos, indigenous groups, livestock farming, oil extraction, and the concepts of “progress” or “development.” Table 6.1 presents my basic findings and specifies the type of symbol (anthem or coat of arms) for each municipality of Caquetá.
Table 6.1

*Official Symbolism in Caquetá*

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Recognition</th>
<th>Economy</th>
<th>&quot;Progress&quot; or &quot;Development&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colonos</td>
<td>Indigenous groups</td>
<td>Livestock farming</td>
</tr>
<tr>
<td>San José del Fragua</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>a</td>
<td>c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Albarría</td>
<td>a / c.a.</td>
<td>c.a.</td>
<td>c.a.</td>
</tr>
<tr>
<td>El Doncello</td>
<td>a</td>
<td>c.a.</td>
<td>c.a.</td>
</tr>
<tr>
<td>El Pasají</td>
<td>a</td>
<td>c.a.</td>
<td>a</td>
</tr>
<tr>
<td>San Vicente del Caguán</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Carillo</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>La Montanaña</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Solano</td>
<td>a</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Málaga</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Belén de los Andaquies</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Cartagena del Chirarí</td>
<td>a / c.a.</td>
<td>c.a.</td>
<td>c.a.</td>
</tr>
<tr>
<td>Valparaiso</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
<td>a / c.a.</td>
</tr>
<tr>
<td>Florencia</td>
<td>c.a.</td>
<td>c.a.</td>
<td></td>
</tr>
<tr>
<td>Morocca</td>
<td>c.a.</td>
<td>c.a.</td>
<td></td>
</tr>
<tr>
<td>Solía</td>
<td>a</td>
<td>c.a.</td>
<td>a</td>
</tr>
</tbody>
</table>

*Note.* Data from official websites (2016). a: anthem / c.a: coat of arms

The upshot of Table 6.1 is that most of Caquetá’s regional symbols represent and celebrate both agrarian colonization and livestock farming, while only few of them include indigenous groups. However, since this abstract summary does not reflect important differences among Caquetá’s municipalities or the particular manner in which each dimension is represented, Figure 6.5 provides four typical examples of coats of arms.
The recognition of colonos is thus one of the main features of Caquetá’s symbolism: colonos are represented in fourteen local anthems\(^\text{13}\) and nine coats of arms. These symbols honor the heroic labor undertaken by colonos’ in the establishment of new farms. Colonos conquered “uninhabited” lands, transformed the landscape, and introduced cattle ranching. Not surprisingly, colonos are depicted as brave fighters and

\(^{13}\) Only the anthems of Florencia and Morelia are silent about colonos.
anthems explicitly recall their harsh battle against nature. The anthems of Belén de los Andaquies and the department of Caquetá, respectively, claim that “it was the courage and sweat of your colonos and the iron determination of your women that transformed your virgin jungles into this majestic promised land,” and that colonos “were able to forge with sweat this emporium of wealth.” The coats of arms of Caquetá represent a similar idea in the form of rural labor tools like axes, machetes, saws, blades, and picks. The case of La Montañita (C) is possibly the clearest example. Sometimes these symbols even illustrate the linkage between labor, land clearance, and forest loss: the coat of arms of San Vicente del Caguán (B) depicts a steel ax embedded in a tree stump, while El Doncello’s coat of arms (A) includes a tree that was recently cut down. The tree on the ground is known as doncello (prosopis juliflora), which is the name of the municipality (Melo, 2016).

In addition to this recognition of colonos’ labor, the region’s symbolism also glorifies livestock farming. Fifteen municipalities depict cattle ranching in either their coats of arms or their anthems (see Table 6.1). At least six regional anthems explicitly mention cattle as the region’s main source of wealth. The anthem of Cartagena del Chairá, for example, claims that “its colonos transform the jungle with tools and will / They produce livestock and seeds that are the heritage of Caquetá.” The anthem of Solano conveys a similar idea: “Fishing, beaches, and livestock enrich your region / [and] your people with emotion, their customs have persevered.” Moreover, thirteen coats of

---

14 It is less common to depict colonos as peasants (San Jose del Fragua) or with white skin (Milán).
15 The municipality of Solita is a remarkable exception (see image D in Figure 6.5.).
arms honor livestock farming by depicting at least one cow. The cases of San Vicente del Caguán (B) and La Montañita (C) above are examples of this.

By contrast, indigenous groups occupy a secondary place in Caquetá’s official symbolism. Ten municipalities in Caquetá do not even mention or depict them (see Table 6.1). Five anthems refer to indigenous people as the ancestors who lived in the region prior to agrarian colonization. Furthermore, six coats of arms represent indigenous groups by including feather crowns (Solano), spears (La Montañita), monuments (Belén de los Andaquies), myths (Cartagena del Chairá), or people with darker skin (Milán).

Finally, at least ten municipalities convey the ideas of “progress” or “development.” Seven coats of arms include these words alongside other valued ideals like peace, well-being, and labor (see, for example, A and C). Furthermore, municipal anthems provide rich information about how progress is conceived and reaffirmed. The anthem of Solita, for example, claims that religion and colonos brought progress with them: “Christianity and colonizers / by bringing us light and progress / gave life with faith and sweat / to Solita, corner of my dreams.” Similarly, the anthem of Solano asserts that the region where the municipality is located “demonstrated to peasants / labor, progress, and candor / and your forests are the roads / that elevate your wild flower aroma.”

I hypothesize that official symbolism is the expression of much deeper cultural attachments. Tributes to agrarian colonization are observable on streets, neighborhoods,

---

16 Nature also has a place in these symbols, but it is usually shown as an external entity or a natural resource ready to be used.
stores and monuments in parks, all of which explicitly use the highly-valued expression *colono*. There is, for example, a public transportation company, a daily newspaper (*El Colono del Sur*), and an annual music festival (*El Colono de oro*) whose names include the word. My interviewees repeatedly recognized the efforts of past generations: the “founders,” “pioneers,” or “firsts.” This recognition of agrarian colonization is the starting point of a tribute to cattle ranching. Additionally, all of Caquetá’s municipalities hold regular cattle fairs (*ferias ganaderas*), which are important public festivities. These fairs tend to begin with a parade and a riding party. Plots of land are auctioned and different breeds of cattle are exhibited and traded. These events are the main “showcases” of ranchers’ efforts to increase productivity and improve cattle genetics (interview 67). Contests are organized and awards granted to the best cattle (breed and size), the best dairy cow (*la vaca lechera*), and the person most skilled with a chainsaw.

Caquetá’s cattle-centered culture also has aesthetical manifestations. I was occasionally told that pastures are valued for their beauty. Elena, the sister of a small cattle rancher in El Doncello, explained this point to me (interview 74). She told me how she had given her brother one million pesos (slightly more than US $300) to hire someone to “clean up” (*limpiar*) areas of his farm that were becoming overgrown. She and her brother believe that overgrowth is a sign of abandonment, poverty, or laziness. The real problem for them was the lack of resources and time to keep the farm clean.

---

17 Florencia’s cattle fair is the oldest in Caquetá: in 2018 the city will hold its 56th annual fair. It is organized by the Regional Committee of Ranchers (Comité de Ganaderos) and the Company of Fairs and Slaughterhouses (Compañía de feria y mataderos del Caquetá - Cofema) and supported by the government of Caquetá and the municipality.
They both admiringly recalled how their father, who was a pioneer and direct beneficiary of the INCORA, used to keep the farm clean.

Given the deep roots of this cattle culture, few locals criticize it. Those who raise questions tend to be based in the educational sector, which is relatively more exposed to environmental discourses and less dependent on farming. Unsurprisingly, these critiques tend to be more important in urban areas and in Florencia, the capital city.

As far as criticisms are concerned, it is worth recalling a political debate over regional symbolism that occurred a decade ago. In 2009, Florencia approved a new coat of arms that highlighted the importance of both nature and cattle ranching. Figure 6.6 presents the old (A) and the new (B) coat of arms. I here emphasize three important changes. First, the new symbolism no longer includes tools associated with rural labor. The two axes were replaced with a pair of Gucamayas (scarlet macaws), a distinctive bird species from the Amazon region, and a pair of Heliconias. Second, the new coat of arms recognizes the existence of a unique type of cattle: caqueteño creole. Although the old (A) and the new (B) coats of arms both depict cattle, the type of cow was changed from Zebu to creole, reflected in its new color and absence of humps. Finally, the message along the bottom of the old coat of arms—“god, union, and progress”—was simply erased.
It is important to note that Florencia’s new coat of arms was the result of a conscious political decision in which the city council unanimously approved the project of the Secretary of Education. The proposed modifications aimed to recover a regional identity through the inclusion of the creole cattle, to honor the Amazon’s indigenous fauna, to recognize the abundance of water, and to modernize the image of the city as a way of strengthening local institutions. The new coat of arms was also part of a plan to promote ecotourism and attract national and international visitors. The Municipality of Florencia claimed that the local government had been “working for the modernization of the municipality and… looking to strengthen institutions by introducing a new corporate image that allows us to project the city to Colombia and the world as a place for ecotourism” (Town Council of Florencia, 2009). All members of the local council were content with the proposal, and one claimed that the new coat of arms finally recognizes
that “Florenzia is the golden gate of the Amazon region: the old one does not represent us and conveys the very opposite” (Town Council of Florenzia, 2009).

In sum, Caquetá’s official symbolism illustrates that its identity is largely based on the valorization of agrarian colonization and livestock farming. What’s more, these symbols were explicitly designed to convey this impression. Raising cattle and becoming a rancher is a source of not only economic income but also of prestige and pride.

6.4.2. The Dominant Moral Economy of Putumayo

A different type of integration trajectory configured a different dominant moral economy in Putumayo. As in the case of Caquetá, I propose that the study of Putumayo’s official symbolism can shed light on the economic practices valued at the local level. To this end, Table 6.2 provides basic information about Putumayo’s symbolism (anthems and coats of arms) using the same methodology employed above to study Caquetá. The table’s columns provide information about relevant social actors (colonos and indigenous groups), economic activities, (livestock farming and oil extraction), and values (progress and development).
Chapter 5 explained Putumayo was integrated through the active promotion of oil extraction during the developmental era. Agrarian colonization advanced as a byproduct of extractive industries, with little support from the state. Putumayo is also a region of recent agrarian colonization whose identity emphasizes oil extraction over cattle ranching. Table 6.2 illustrates that Putumayo’s symbolism celebrates the role of colonos. In total, nine municipalities explicitly represent colonos in their anthems or coats of arms.18 However, compared to Caquetá, recognition of colonos is somewhat less frequent in Putumayo, where four municipalities do not mention them at all. The overall difference is minor, however.19

---

18 I should make an important coding rule explicit at this point. Sometimes Putumayo’s regional symbolism depicted inhabitants of the municipality without explicitly indicating whether they were colonos, peasants, or rural laborers. When this was the case, I assumed that the symbol did not represent colonos.

19 Almost every municipality in Caquetá recognizes the historical role of colonos by representing a harsh battle against nature in which colonos are the soldiers and tools used in the countryside are the weapons.
In addition to recognizing *colones*, Putumayo’s symbolism represents indigenous groups as protagonists. In fact, only three municipalities fail to mention them, which suggests the strength of indigenous recognition in the department. For example, the anthem of Valle del Guamuéz highlights and alliance between indigenous groups and *colones*: “Praise to men and women / Pioneers of trails and tillage / The dreams they brought in their hands / Founders of this town’s history / And with indigenous groups they planted / Seeds of progress and hope.” A similar example is Puerto Leguizamo’s anthem:

In the new conquests Leguizamo goes with faith on the future, with joy and honor / The native, the settler, and urban people too / Everyone is solidary for our good / Today I scream hope for a better world / The jungle is Colombia, the homeland will be.

The important place accorded to indigenous peoples in Putumayo’s official symbolism is also evident in eight coats of arms. For example, two of them Valle del Guamuéz and Santiago—include feather crowns to represent the presence of indigenous groups (Figure 6.7, A and C). In particular, Santiago’s crest (C) represents a handshake between a *colono* and an indigenous person who live together in harmony.
Putumayo’s symbolism is also useful when it comes to identifying the economic sectors that are culturally valued. Official symbols in Putumayo do not exalt livestock farming. The third column of Table 6.2 above (livestock farming column) is almost empty, suggesting that Putumayo, unlike Caquetá, has not configured a regional identity centered on cattle ranching. Naturally, this absence does not mean that cattle farming is not present in reality, as Figure 6.2 illustrated. It merely suggests, as a hypothesis, that Putumayo is not as culturally attached to livestock farming as Caquetá is.

By contrast, eight municipalities of Putumayo recognize the importance of oil extraction (Table 6.2), a finding that reflects the profound social legacies of this industry, first introduced during the developmental era. It is worth noting that the recognition of oil

---

20 Only three coats of arms in Putumayo represent livestock farming: Orito, Villagarzón, and San Francisco. For example, Orito’s coat of arms (B) includes the silhouette of a cow surrounded by an oil platform. Furthermore, the anthem of Villagarzón directly presents the municipality as the “livestock capital” of Putumayo.
extraction is not uniform but exhibits a clear geographical pattern\textsuperscript{21} and is present even in municipalities without active exploitation. Oil extraction is frequently represented by a platform on most coats of arms (see, for example, Figure 6.7, images A and B) and with a black stripe on the department’s flag (Figure 6.8)

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{flag.png}
\caption{Putumayo’s flag}
\end{figure}

Reprinted from the department’s development plan (2016).

Furthermore, although Putumayo’s anthems are less explicit than its coats of arms, oil is mentioned in the anthem of Orito: “Black gold lies on its floor / And its fertile fields are seen / Their rivers are golden snakes / That today are seen offering life.” Putumayo’s official symbolism is replete with the color black and images of oil platforms\textsuperscript{22}.

In sum, my analysis of Putumayo’s official symbolism suggests that Putumayo has a regional identity that is distinct from Caquetá’s. Agrarian colonization, progress, development, and indigenous peoples are recognized by both departments. However,

\textsuperscript{21} While the symbols of the municipalities of the upper Putumayo do not represent oil extraction, those of every municipality of the plains, apart from Puerto Leguizamo, do.

\textsuperscript{22} In addition, the ideas of “progress” and “development” are weaker in Putumayo. Five municipalities mention it in their anthems or on their coats of arms.
Putumayo’s recognition of agrarian colonization and progress is weaker, whereas its recognition of indigenous groups is stronger. Most importantly, livestock farming is culturally marginal in Putumayo, which overwhelmingly celebrates oil extraction.

6.5. Conclusion

This chapter is the final step in a contextualized paired comparison between Caquetá and Putumayo whose objective was to illustrate those entrenched legacies of the developmental era that transcend purely utilitarian economics. The contribution of this chapter has been to generate a set of new, empirically-grounded hypotheses that can help us better understand variation in cumulative deforestation and its reproduction over time. To this end, instead of narrating the history of the two regions after the developmental era, I analyzed three of the most important contemporary phenomena impacting the environment in the two departments: the peace process, the political economy, and the moral economy. The legacies of the developmental era are far more extensive than mere utilitarian considerations, and the objective of this chapter was to examine the social, political, and cultural factors shaping prospects for environmental policies in the region of interest.

First, scholars, journalists, and activists observing increased Amazon deforestation following the demobilization of the FARC tend to emphasize temporal rather than spatial differences. Amazon deforestation is an uneven phenomenon, and this dissertation analyzed the difference between Caquetá and Putumayo. It is still necessary to determine why deforestation is geographically concentrated in the northern parts of the
arc of deforestation given that the FARC was influential in both the north and the south. This dissertation suggests that contemporary deforestation is not simply the result of the power vacuum left by the FARC. Rather, it is a product of the particular trajectories of economic and political integration that this dissertation highlighted. Caquetá, the region where deforestation has increased most markedly in recent years, displays high overall levels of cumulative deforestation. By contrast, Putumayo, the region that was integrated through oil extraction, has experienced only moderate deforestation since the withdrawal of the FARC.

Second, with respect to the regions’ dominant political economies, this chapter highlights the difficulty of finding local allies to promote anti-deforestation policies in Caquetá, in contrast with the population’s radical and unified opposition to the introduction of oil extraction. Conversely, in Putumayo opposition to oil extraction is fragmented and moderate, and resistance to anti-deforestation laws is weak. These differences allow me to hypothesize that Amazonian regions that were integrated through commercial farming will oppose both anti-deforestation policies and large-scale extractive activities in the twentieth-first century. By contrast, I predict that opposition to anti-deforestation policies and additional extractive activities will be moderate in provinces integrated through the extractive agenda during the developmental era.

Third, in relation to the moral economy, this chapter showed how livestock farming, which the academic literature has identified as the main proximate driver of deforestation in the Amazon, is positively valued in Caquetá. Compared to Putumayo, where different economic sectors and social actors are valued, Caquetá exhibits a clear
cattle ranching culture that celebrates agrarian colonization, progress, and development. This chapter thus suggested that cumulative deforestation is higher in Caquetá compared to Putumayo because cattle ranching not only introduces concrete economic incentives but also creates and reproduces particular cultural attachments. In abstract terms, one can hypothesize that Amazonian provinces integrated through the commercial farming agenda during the developmental era will have a farming identity, which is an important factor in explaining high levels of deforestation.

When the interaction between integration trajectories and contemporary transformations is considered, we observe that Caquetá, the province with high cumulative deforestation, exhibits the economic, political, and cultural features that tend to reinforce its deforesting path. Conversely, in Putumayo, not only is cumulative deforestation moderate but the legacies of the developmental era themselves facilitate the modification of its contemporary features. On the basis of my empirical findings, I propose that provinces integrated through commercial farming will tend to strongly oppose both anti-deforestation policies and extractive industries given the political and cultural legacies of the developmental era. By contrast, provinces integrated through the extractive agenda of the state will exhibit little opposition to anti-deforestation policies or the advancement of the oil industry. Naturally, these hypotheses need to be properly tested.
CHAPTER 7. CONCLUSIONS AND IMPLICATIONS

7.1. Introduction

Deforestation in the Colombian amazon has recently become one of the most important environmental issues of the country. There was an increase in academic and public attention regarding this matter, after the achievements of the peace process between the government and the FARC. Initial fears about the possible negative consequences of the demobilization of the guerrilla group materialized, and annual deforestation rates in the Amazon rapidly increased. However, my dissertation argued deforestation in the Amazon should not be conceived as a new phenomenon, its history dates back to at least the beginning of the twentieth century. Therefore, it is convenient to study the role of Colombia’s conflict and contemporary deforestation as part of enduring trajectories of territorial integration. These historical paths are useful to comprehend what is new and what is not.

The main objective of this last chapter is to summarize the key contributions of the dissertation, highlight some avenues for future research, and develop some implications for policy regarding the dissertation’s argument. In this vein, the chapter has four additional sections. The second section quickly summarizes the types of contributions contained in this dissertation. The third section reflects on possible alternative explanations. The fourth section briefly presents the limitations of the arguments presented and delineates some avenues for future research. The last section
develops some implications for policy, which defend the importance of taking historical legacies into account when designing contemporary anti-deforestation policies.

7.2. Contributions: Deforestation in the Amazon, Subnational Development, and STR

This dissertation makes at least three types of contributions. First, it helps deforestation scholars and *comparativists* understand territorial integration and the ensuing deforestation in the Colombian Amazon piedmont, which is a relatively understudied case. Pervasive violence in the region has prevented the in-depth study of the Colombian Amazon. Unsurprisingly, most of the social sciences literature focuses on countries like Brazil, Peru and Ecuador (Rudel, Flesher, Bates, Baptista, & Holmgren, 2000). Furthermore, this dissertation has the merit of anticipating the negative environmental effect of the FARC’s demobilization. Although I did not directly study the role and actions of this guerrilla group, the basic inspiration of my research agenda arose from the expectation that a successful peace process could bring about major transformations for the region.

Second, in theoretical terms, this thesis proposed both a conceptualization (Chapter 2) and a parsimonious set of empirically-grounded hypotheses (Chapter 3) regarding deforestation dynamics in subnational Colombia. This was done with the aim of understanding the complex relationship between the state’s strength and deforestation. The analysis goes beyond the traditionally narrow focus on the enforcement of anti-deforestation policies (Alcañiz & Gutiérrez, 2018; Fernández & Garay, 2019). As such, the analytical contributions of my thesis should be interpreted as part of a hypothesis-
generating effort on a relatively new topic in political science. The empirical data is meant to support these hypotheses, but additional research is necessary to test their accuracy and explore their ability to inform out-of-sample contexts. In the dissertation, I elaborated on the relationship between forest cover and state territoriality in lieu of two emerging political science scholarship concepts: the enforcement paradigm and subnational state strength. I proposed that forest areas tend to be “brown zones” because agrarian colonization transforms the landscape in the short term and leads to the formation of the state in the long term. Due to this proposal, I believe that my thesis reflects on the importance of avoiding geographical determinism in political science, and emphasizes basic ecological characteristics of territories that are usually seen as hostile for the proper development of state authority.

Based on this general concern, I proposed that cumulative deforestation largely results from different degrees and types of integration. Cumulative deforestation tends to be high in territories that are relatively more integrated such as Caquetá and Putumayo and where legal commercial farming had been consolidated during the developmental era such as in the case of Caquetá). Furthermore, I propose that these major features associated to different integration trajectories need to be considered when studying the impact of posterior, secondary transformations like market-oriented reforms, coca cultivation, capital investments, violence, and opposition to anti-deforestation policies based on pure law enforcement.

Finally, an additional contribution of this dissertation is to combine different methodological approaches that are rarely implemented by studies on deforestation. As
most contemporary deforestation scholarship does, I incorporated an aerial view that is based on geographical information systems and technical processing of *Landsat* satellite images (Appendix A). This aerial view was analyzed parallel to a ground level view, which is based on qualitative fieldwork in Caquetá and Putumayo. The objective of the ground level fieldwork was to dialogue with local populations and understand the *why* and the *how* of their actions (Hoffmann, Garcia, & Krueger, 2018). Furthermore, because most existing literature is focused on contemporary, short-term transformations of the landscape, I decided to incorporate a historical perspective that can map different paths of destruction and elaborate some hypothesis to explain them. It is worth noting that an original geodatabase on cumulative deforestation and forest regrowth was produced, which complements contemporary efforts to monitor annual deforestation rates.

7.3. Alternative Explanations

In order to properly understand the contributions of this thesis, it is necessary to analyze at least *three* plausible alternative explanations of cumulative deforestation in the Colombian Amazon.

First, one could suggest that subnational variation in deforestation is the result of different levels of economic development, thus implying that the most developed departments are highly deforested and the least developed ones are not. Based on this argument, one can claim that Putumayo is less deforested than Caquetá because the former is more peripheral and less developed than the later. My thesis captures the importance of economic development by talking about different *degrees* of integration
(see Chapter 3). In this sense, different levels of economic development are vital to understand the basic difference between departments that are part of the “arc of deforestation” and those that are not. However, the difference between Caquetá and Putumayo, two provinces of the arc of deforestation, can not be explained by different levels of economic development. First, Chapter 4 provided historical information to understand why Putumayo was strategically more important than Caquetá in the late nineteenth and early twentieth centuries, which means that there was a reversal of fortune during the twentieth century. Second, contemporary data on economic development suggest that Putumayo has not only higher GDP but also population density compared to Caquetá.

The second alternative explanation would emphasize the fact that different levels of cumulative deforestation are simply the result of distinct economic sectors in place. In other words, in order to extract the market surplus, different economic sectors require different infrastructures. Agriculture requires infrastructures such as roads, cooling plants and electricity. The extraction of oil, by contrast, requires the construction of basic infrastructures such as a pipeline. In this context, my argument on different cumulative deforestation in Caquetá and Putumayo does not contradict this alternative explanation based on the economic sectors in place. In fact, the idea of different types of integration (see Chapter 3) refers to the advancement of different economic sectors in the Amazon region. However, my argument emphasized the fact that these economic sectors neither emerged nor consolidated naturally. The Colombian state implemented different policies
during the developmental era, which explain the advancement of different economic sectors and the corresponding requirements to take the market surplus out.

The third and final reasonable alternative explanation suggests that different levels of Amazon deforestation in Colombia are mainly the result of coca cultivation. While Chapter 6 provided concrete empirical evidence to understand the role of coca crops in deforestation, at this moment I would like to assess its analytical significance for explaining my outcome of interest. There is no doubt that forests are cleared with the aim of cultivating coca in the Amazon region. However, I propose that coca cultivation is unable to explain different levels of cumulative deforestation between Caquetá and Putumayo for two reasons. First, coca cultivation may be able to explain different rates of deforestation after the eighties. Because I adopted the long view, my outcome of interest is not annual rates of deforestation but the stock of deforestation. Coca crops are unable to explain different levels of cumulative deforestation because they are relatively recent. Second, during the last two decades, coca cultivation has concentrated in Putumayo instead of Caquetá, which is the department that has deforested the most.

In sum, there are at least three important competing alternative explanations that one can imagine for explaining subnational differences in Amazon deforestation. I have argued that the level of economic development, the economic sectors in place and the cultivation of coca are unable to explain different levels of cumulative deforestation in the Colombian Amazon: they either naturalize economic dynamics or rarely consider the long view.
7.4. Limitations: The Road Ahead

My thesis should be interpreted as the first step of an agenda-setting effort that needs to be further developed and theorized in the years to come. The objective of this section is to be explicit about some of the argument’s limitations in order to sketch out concrete avenues for future research. I broadly identify at least two main challenges: the transition from hypothesis generating to hypothesis testing and the determination of the ability of the proposed hypotheses to inform out-of-sample contexts.

7.4.1. From Hypothesis Generating to Hypothesis Testing

Although my conclusions are still preliminary, their value lies in the fact that they were able to generate a parsimonious set of politically-oriented hypothesis that could be properly tested. Although contemporary standards in political science are more interested in hypothesis testing than in hypothesis generation (Lieberman, 2016), these two types of research are part of the same research process and face different challenges. “It is difficult to devise a program of falsification the first time a new theory is proposed. Path-breaking research is, by definition, exploratory. Subsequent research on that topic is confirmationist insofar as its primary task is to verify or falsify a preexisting hypothesis” (Gerring, 2004, p. 9). In this context, I have provided data to comprehend cumulative deforestation caused by different degrees and types of integration. These hypotheses are based on a paired, contextualized comparison that explores the historical process in which Caquetá and Putumayo diverged during the developmental era. This divergence is presented as a consequential critical juncture.
Despite the strengths of this research strategy, I believe that additional theoretical and empirical work need to be carried out in order to properly exploit the promising comparison. For example, one would still need to collect: historical data to understand forest cover in in the early fifties, the political process by which Caquetá, instead of Putumayo, was selected to expand the agrarian agenda, the rationale of the investments of Nestlé and Texaco in Caquetá and Putumayo respectively, and the role of agrarian agencies in Putumayo (although this department was mostly integrated through the extraction of oil, the agrarian agenda of the state was not entirely absent). ¹

Besides the study of this critical juncture, many other topics were briefly analyzed in this dissertation. For example, the dissertation covered: advancement of market-oriented reforms, empowerment of the non-developmental state agendas, generalization of coca crops, influence of illegal groups, cultural legacies, and concrete interests and actions to prevent deforestation. All these aspects are secondary analytically speaking because they were not able to radically modify the types of integration trajectories defined during the developmental era. In fact, a good argument can be made to emphasize the fact that these transformations reinforced enduring integration trajectories in Caquetá and Putumayo (see Chapters 5 and 6).

However, the way in which these factors contribute to the dynamics of deforestation should be studied individually. A concrete challenge arising from my thesis

¹ Historical evidence regarding the role of the INCORA in Putumayo is very difficult to find. In theory, I should be able to obtain better data of the agrarian sector in this province before the 1980s to illustrate not only the result, but also the historical process by which commercial farming was barely consolidated. I requested access to the INCORA’s archives in Bogotá, but it was not possible.
is to determine to the extent to which these secondary and subsequent changes need to be elaborated on. Each of these factors could be conceived as one autonomous project. I would need to improve both my research design and my empirical strategies to develop them. The most similar systems design that I employed was useful to explore divergent trajectories over time in the Amazon. Nevertheless, after the developmental era, the idea of two similar provinces is difficult to defend. Contemporary comparisons between Caquetá and Putumayo need to seriously consider the fact that Caquetá and Putumayo are not as similar as they used to be in the mid-twentieth century.

7.4.2. Do the Findings Travel?

Given the limited state of knowledge of the topic in political science, my thesis chose depth over breadth. This allowed me to underpin the particular characteristics of the selected cases but risked my ability to research additional cases. An additional concern relates to the external validity of my findings, that is, their ability to inform out-of-sample cases. I do not propose a theory to explain deforestation around the globe. My argument is very limited to explain deforestation beyond the tropics. The dissertation, however, could be useful to enlighten other developing countries which still have dense standing forests. In this vein, I would expect to find similar cultural, political, and economic legacies concerning development and colonization projects that were implemented after WWII.

---

2 For example, one could consider increasing the number of observations by disaggregating the unit of analysis to the local level.
External validity is, therefore, high in tropical rainforests, developing countries, and densely forested areas that were under massive transformation during the twentieth century. However, it is important to recognize the importance of studying cumulative deforestation in regions where forests are not dense but fragmented and where timber markets are an important driver of deforestation. Based on deforestation literature, I assume that agricultural expansion is the main driver of deforestation in Latin America. However, I am aware that timber markets could be more important in other continents.

Given these continental differences regarding the drivers of deforestation, a theory on the drivers of Amazon deforestation would probably be limited to the ecological region in question. An important avenue for future research is to refine and bolster the arguments of my dissertation by expanding its geographical and theoretical scope. Although the subnational comparative method is very powerful for generating and testing new hypotheses on very complex issues, it limits researchers’ ability to inform out-of-sample country contexts. For this reason, I would plan to expand my study beyond Colombia to the Peruvian Amazon in upcoming years. I would systematically compare the state-led strategies of regional development in the Amazonian regions in Colombia and Peru. This combined, cross-national, and sub-national approach would allow me to explain different levels of Amazonian deforestation between and within countries.

Finally, although I did not study every region of the Colombian Amazon, I would claim that my case selection allows me to draw a conclusion about the Colombian case at large. This is due to the fact that 75% of cumulative deforestation in the Colombian Amazon has occurred in Caquetá and Putumayo. I would extrapolate that my findings
could explain the integration trajectories and ensuing deforestation of both Guaviare and southern Meta. It seems that the department of Guaviare has followed a similar trajectory to that of Caquetá. Despite some ecological differences and pre-twentieth century development paths, livestock farming was consolidated as a result of state interventions. Similarly, cumulative deforestation in southern Meta could be interpreted as an extension of Caquetá’s expansion (Leal, 1995).³

7.5. Implications

Besides its general empirical, theoretical, and methodological contributions, my dissertation illustrates the potential of political science to inform real-world debates. Given that Amazon deforestation is an issue of public interest, this dissertation cannot finish without reflecting on its implications regarding public policy. I recognize that, instead of studying the design and implementation of specific anti-deforestation policies, my thesis focused on the long-lasting consequences of varied integration trajectories. However, I believe that the enduring legacies of past development strategies can illustrate contemporary policy debates. The goal of the following paragraphs it to explain how policy debates could be enriched.

7.5.1. State Detachment and Dislocation

This dissertation studied the complex relationship between the territorial reach of the state, subnational development, and deforestation. Dense forests in the tropics such as

³ There is even a border dispute between Caquetá and Meta over these territories, because people in La Macarena tends to recognize their cultural, economic and political ties to Caquetá.
the Amazon tend to be “brown” zones (O’Donnell, 1993). Territorial integration and forest cover are related because they are both influenced by social factors such as agrarian colonization, commercial agriculture, and road networks. These factors tend to promote massive forest clearance in the short term and territorial integration in the long term. Put differently, the expansion of the agricultural frontier has historically preceded the territorial reach of the state. The recognition of this negative association does not necessarily mean that densely-forested areas of the Amazon are always out of reach. After the developmental era, the territorial reach of the state became more diverse because it pursued at least four distinctive sectoral agendas in the region: agricultural, extractive, environmental, and ethnic agendas. However, recent non-developmental forms of reach tend to be institutional rather than organizational. They also tend to promote indirect rule rather than direct rule and have a restricted rather than an ambitious scope. Although the state is not absent, its reach is certainly limited.

Historical and contemporary deforestation has tended to occur where state reach is formal, delegated or focalized. As a consequence, environmental regulations are difficult to implement due to the fact that the social conditions that favor the exercise of state authority (e.g., road networks) are rarely in place. However, it is important to highlight that the absence of these conditions is one of the main explanations of forest preservation. In other words, while deforestation traditionally happens in “brown zones,” the expansion of the agricultural frontiers over forests may facilitate the proper integration of the region. The implementation of any state policy, including anti-deforestation policies, becomes easier after massive forest loss. Thus, a policy implication of the persistent association
between territorial reach and forest cover resulting from state embeddedness in agrarian colonization is the Janus face of the state.

One of the most important challenges to effectively prevent forest loss in the Amazon region is to avoid this statehood trap. If the antecedent conditions of state reach are not questioned, the trap could become a tragedy in which forest clearance is the cost of extending state power and state retrenchment is the price of protecting the forest. Needless to say, this standard is very high for an historically weak state like Colombia, where local populations in the margins tend to be in need of and call for the most basic public goods and services.

History is as much about persistence as it is about change, which means that deeply entrenched historical paths could be altered to some extent. State embeddedness in agrarian colonization does not need to be immutable. It is time to envision concrete ways to consolidate a weak state without previously having closed its internal frontiers: a state that is not only detached from the social conditions that favor deforestation but also has a different kind of territoriality. In my opinion, increasing agrarian colonization, emerging commercial agriculture, and expanding infrastructures should no longer be crucial antecedent dimensions of the territorial reach of the state if conservation of the Amazon is a serious commitment.

7.5.2. Dealing with the Legacies of the Developmental Era

This dissertation claimed that agricultural frontiers are not equally active by conducting a paired, contextualized comparison between Caquetá and Putumayo.
Chapters 4, 5 and 6 provided crucial evidence to understand the formative role of state-led policies that were implemented during the developmental era. The developmental era is a historical period that was analytically conceived as a critical juncture. I also argued that later transformations such as market-oriented reforms, coca cultivation, violence, the empowerment of the environmental, and ethnic agendas were not able to alter the basic characteristics of each region’s integration path. In fact, the environmental impact of these phenomena is mediated by the studied underlying trajectories.

After the developmental era, the role of the state is mostly confined to its regulatory functions. The empowerment of the environmental and ethnic political agendas occurred in parallel to the advancement of market-oriented reforms. Unsurprisingly, neoliberal discourses tend to govern the way in which deforestation is perceived by state authorities. “Most forest policies articulate the core principles of neoliberalism, such as a minimal role of the state, an emphasis on voluntary commitments (for both state and business), market-based solutions and private sector-led solutions such as REDD+ and forest certification schemes” (Bhagwat, Humphreys, & Jones, 2017, p. 4).

Most anti-deforestation policies tend to be restricted to the realm of regulation and prohibition, and Colombia is not an exception. This restriction is due to an assumption that the state no longer coordinates development nor its environmental impacts. Thus, state policies tend to be focused on the design and enforcement of land-use planning

---

4 See Humphreys (2009) for an theoretical and empirical analysis of the relationship between forest policies and neoliberalism.
institutions such as reserve forests and natural parks. Scholars have also adopted the enforcement paradigm to study deforestation dynamics and political scientists are no exception (e.g., Alcañiz & Gutiérrez, 2018; Garay & Fernández, 2018). However, if the argument of this dissertation is correct, state-made markets will not be so easily stopped by introducing and enforcing regulations that hardly consider enduring integration trajectories. For this reason, I believe that my thesis makes an important contribution to contemporary debates on possible anti-deforestation strategies by highlighting the importance of considering varied legacies of the developmental era.

One of the main challenges of our times is to envision meaningful policies and actions that have the potential to tackle the environmental legacies of the developmental era. The simple imprisonment of colonos, ranchers, loggers, and coca growers has the potential of escalating conflict (the region was deeply afflicted by violence and it is crucial to build a stable and durable peace) and mimicking the inefficacy of the war on drugs; the policy that after four decades has been unable to eradicate coca crops from the Colombian Amazon.

7.5.3. The Environment for Peace and Peace for the Environment

Amazon deforestation has markedly increased during the implementation of the peace agreement between the Colombian government and the FARC. Due to the fact that most research at present is focused on short-term aggregate effects, my dissertation has the potential of unveiling the role of enduring trajectories of territorial integration and concrete causal mechanisms.
The effect of the demobilization of the FARC on deforestation has not occurred in a vacuum, it is mediated by varied, enduring trajectories of economic and political integration. Although the FARC has withdrawn from different territories while deforestation has increased in the aggregate, the rate of change has not been the same. While Caquetá and Putumayo were deeply influenced by the FARC (Ramírez, 2011; Torres, 2011; Vásquez, 2015), increases in deforestation are comparatively much higher in Caquetá. After studying the way in which these departments diverged throughout history, one can easily understand at this point why the environmental effect of the FARC does not happen in a vacuum and is, in fact, mediated by enduring integration paths.

Deforestation scholarship has only studied the aggregate, causal effect of violence on deforestation, which means that the concrete causal mechanisms by which deforestation results from violence still need to be uncovered. I propose that a promising avenue of research is to rigorously study the FARC’s role before demobilization. Just like the state, the FARC pursued different sectoral agendas in the region: the guerrilla was Janus-faced too. This nuanced approach avoids an over-simplistic and often politically-biased analysis meant to blame or praise the environmental impact of the armed group. On the one hand, there is important evidence to suggest that the FARC may have contributed to Amazon deforestation because they not only promoted (and sometimes forced) the cultivation of coca crops and the production of cocaine, but also helped to build and maintain road networks. Because both the cultivation of coca and the
construction of roads are important drivers of deforestation in the Amazon, one could state that the guerrilla promoted deforestation.\(^5\)

Nevertheless, there is important evidence to suggest that the FARC played an important role in protecting the forest. Although systematic research still needs to be carried out, I would suggest that the FARC’s environmental effect was both regulatory and structural. On the one hand, the regulatory role of the FARC can be described as an example of “gunpoint conservation,” which rests on the authority of the group in the region. Since the late nineties, the FARC regulated the use of natural resources: they limited (but did not prohibit) activities such as hunting, fishing, and logging. Local populations were punished when those limitations were not respected. The FARC behaved as a multi-dimensional authority and environmental issues were no exception (Arjona, 2016). Therefore, it is still necessary to study the objectives of the group when introducing these regulations as well as their spatial and temporal differences: and efficacy. This research avenue would allow us to assess if the state has something to learn from the strategies of the FARC.

On the other hand, the influence of the FARC also favored the conservation of standing forests beyond intentional regulations by constraining economic investments and migration to the region. Economically, the FARC’s presence made investments risky, which, in turn, limited the expansion of both the agricultural and the extractive frontiers.\(^6\)

\(^5\) Furthermore, the guerrilla did not always oppose the expansion of the extractive agenda and attacked the infrastructures of the oil industry, which has caused substantive environmental damage.

\(^6\) It has been suggested, for example, that guerrilla presence and armed confrontation in Caquetá delayed the entrance of oil companies (Ciro, Barbosa, & Ciro, 2016, p. 425).
The FARC implemented a system of “revolutionary taxes”, which are locally known as *vacunas* (vaccines in Spanish – a term for an illegal fee). Farmers and merchants were forced to pay annual taxes to the guerrilla. The calculation of the tax often depended on different levels of wealth. Those who did not pay were forced to leave, kidnapped or killed (interview 29). Furthermore, migration to the rural and forest areas of the Amazon region was strictly controlled by the FARC to prevent the entrance of their enemies. In order to reach and settle in a particular area, it was necessary to know a local person, which would not only facilitate the entrance of the outsider, but also took responsibility for his/her actions (Cancimance, 2017). Thus, based on my fieldwork, I hypothesize that the demobilization of the FARC increased deforestation by fostering investments and migration to the Amazonian region.

In conclusion, to understand the environmental consequences of civil wars, it is necessary to develop studies that are not solely focused on temporal variation and the aggregate causal effect. It is convenient to study not only spatial variations, as this dissertation did, but also the causal mechanisms by which civil wars may affect the forest. To that end, this section proposed some ideas to unpack these mechanisms. The FARC’s authority was a Janus that preserved the Amazon by introducing environmental regulations, limiting investments, and controlling migration to the region. The FARC also promoted forest transformation by inducing road building and coca cultivation.

7 Furthermore, authorization to permanently settle was dependent on residence certificates that were given by peasant organizations (Juntas de Acción Comunal), which were closely watched by the guerrilla.
7.5.4. A New Developmental Critical Juncture?

Scholars strongly disagree on the possibility of identifying a critical juncture while it happens due to the magnitude of its influence and the endurance of its legacy is still unknown at that point. The identification of a critical juncture is, at best, uncertain when the enduring consequences of a particular historical moment have not happened (Capoccia & Kelemen, 2007). Despite this important cautionary note, one could suggest that Colombia is undergoing a new critical juncture (see, for example García Villegas, 2018) that has the potential of having profound environmental consequences in the country’s Amazonian region (PNUD, 2014).

The idea that peace could only be achieved through the active promotion of economic and social development in regions that were deeply-afflicted by violence, has returned as a consequence of the peace process between the Colombian government and the FARC. This dissertation suggested that state power and order could be established through economic and political integration. Sergio Jaramillo, former High Commissioner for Peace in Colombia, defended the concept of a “territorial peace,” to support the idea that the implementation of integral policies in particular territories is necessary for building peace (Jaramillo, 2013). Furthermore, the peace agreement explicitly recognizes several tools to promote the economic and social development of marginal and often problematic regions. Peace building efforts in Colombia are territorially prioritized according to specific factors. Given their high levels of violence, most of the municipalities in Putumayo, Caquetá, Meta, and Guaviare, where deforestation has historically occurred, have been prioritized.
If the theoretical claims of this dissertation are correct and the Colombian Amazon region is undergoing a new developmental critical juncture, contemporary peace-building efforts can end up promoting massive deforestation in the long run. Given that (compared to the developmental era) the environmental agenda is stronger at present, one would expect to find not only different strategies from state agencies, but also different demands from local populations. How do environmental concerns shape peace-building efforts in the Amazon region?

Briefly, the demands of local populations have not changed over time, nor has the state seriously considered the ecological challenge at hand. After the peace agreement, the state implemented an ambitious participatory process to aggregate the demands of local populations in prioritized regions. The idea was to design Development Programs with Territorial Perspectives (PDETs) through participatory mechanisms. Although the implementation of these programs had not started when I finished this thesis, the expectation is that state investments will likely increase in the upcoming years. I was able to participate in a couple of these meetings, where I observed how historically excluded populations were in need of and called for basic public goods and services such as roads, bridges, electricity, schools, and health posts; as well as access to land and credits. Explicit concerns on the probability of fostering deforestation were rarely voiced. The peace agreement was mostly seen as a window of opportunity to mobilize historical demands.  

---

8 The official documents with these development plans were recently released and basically confirm what I was able to observe.
The basic concerns of the state were not radically different in these meetings. Apart from clarifying that land-use planning institutions needed to be respected, most PDET s were discussed and designed without considering their possible impact on deforestation (interview 34). Therefore, the usual provision of highly-valued public goods is likely to replicate the problems of the past that this dissertation presented.

The only program being implemented promotes the voluntary substitution of coca crops in exchange for monthly payments. These programs could increase deforestation depending on the way in which farmers decide to invest the cash transferred to them. Although it is too early to know how farmers are investing this payment, it is reasonable to expect that their decisions would be highly dependent on the dominant economic alternatives in place and the activities that are proven to work. A farmer in Caquetá explained me this idea with a Colombian saying: “seeing is believing” (interview 78).

Based on my dissertation’s argument, I hypothesized that the environmental impact of crop substitution on the forest would probably depend on the region. The voluntary substitution of coca crops in Caquetá is likely to increase cattle farming. The transformation would be uncertain in provinces like Putumayo, where a default economic alternative is barely consolidated.\textsuperscript{11}

\textsuperscript{9} The peace agreement also promised to discusses land-use planning institutions. Given that peasants and ranchers have occupied forest reserves for a long time, the idea is to subtract additional areas of the reserve in order to allow the allocation of public land to private hands.

\textsuperscript{10} Coca growers are compensated for pulling out coca crops. Peasants are receiving around $US 350 per month during two years. In theory, this program will be complemented by more ambitious programs to promote the legal farming economy.

\textsuperscript{11} Aerial fumigation introduces additional ecological problems that are worth to mention. However, because the impact of this drug policy is not dependent on economic endowments on the ground, these final remarks focus on voluntary substitution.
The last topic that could configure a new developmental critical juncture is the expansion of the extractive frontier, which is in fact the main socio-environmental concern for local populations. Unlike the Putumayo department, where integration was promoted through extractive industries, the production of oil has the potential of introducing significant changes to Caquetá’s enduring trajectory.

In sum, by promoting the development of conflict-affected regions in Colombia, peace-building strategies have the potential of generating serious environmental problems such as deforestation in the Amazon. Nevertheless, it is too early to know if peace-building programs have configured a new developmental critical juncture that will alter or reinforce enduring paths of economic and political integration. After all, when I submitted this dissertation (July 2019) the implementation of developmental plans in prioritized regions had not started; and there were important doubts about the willingness of the new, right-wing government to implement them.
Given that many of the figures included in this dissertation were made using remote sensing data, the purpose of this Appendix is to provide additional information regarding the methodological decisions and general principles that guided my use of this technique. This appendix is written in plural, because the dataset on cumulative deforestation was built with the superb research assistance of the engineer Nicolás Herrera. His abilities with geographical information systems made the construction of the dataset and maps possible.

Artificial satellites were first put into orbit in the late 1960s as part of the “space race” between the United States and the former Soviet Union. Since then, the number of satellites in space has increased markedly, and artificial flying objects have steadily accumulated. Over the last several decades, these satellites have produced thousands of images of the earth’s transformations. The mere existence of such images, however, would be of little relevance to the public if access to them were barred or prohibitively expensive. Fortunately, in recent years many restrictions have been lifted and large amounts of raw geographical data are now freely available on the internet.\(^{184}\)

Technological developments and new availability policies have enabled scholars, activists, and governments to closely monitor landscape transformations. This is no minor transformation. For example, in the mid-1970s, Camilo Dominguez (1975, p. 302), a

\(^{184}\) See Wulder et al. (2012) for an interesting history of Landsat data policy and the scientific implications of freely-available images.
recognized Colombian geographer, acknowledged the importance of remote sensing techniques but complained that the Colombian government was technically and economically “incapable” of obtaining and processing satellite images. That unfortunate reality has thankfully changed; today, both scholars and governments in the developing world have the option to work with satellite images at no cost.

Remote sensing is a research technique that allows governments, activists, and scholars to obtain information about the surface without making physical contact with the object of interest (thus the descriptor “remote”). The technique is commonly used by the so-called hard sciences (e.g., geography, geology, climatology, and environmental studies) to track phenomena such as weather patterns, natural disasters, fires, ice formations, and land use (Campbell & Wynne, 2011). While deforestation scholarship has also utilized remote sensing, it tends to adopt short time horizons and an exclusive focus on contemporary transformations (see Chapters 1 and 2). For instance, Global Forest Watch, the most important and ambitious research project to measure forest loss (and gain) around the world, has produced annual data since 2001.185 Similarly, in Colombia, the IDEAM has produced reliable data on deforestation since the 1990s, and particularly for the last decade.

Despite the fact that it is possible to produce historical data on forest cover from raw data, few scholars have applied recent methodological developments to the study of older satellite images. Landsat images are freely available on the website of the U.S. Geological Survey (USGS), which provided the basic data we needed to create an

original database going back to the 1970s. Additionally, in order to make the results comparable over time, we applied the same procedures to contemporary images, which was necessary to reduce bias and standardize the methodology. My dissertation does not rely on official data because historical images had not been processed and processed contemporary images did not allow for temporal comparability.

Although the use of remote sensing is relatively rare in the social sciences, some scholars have defended the utility of the technique in combination with other research methods (Anselin, 1999; Hall, 2010). An important advantage of remote sensing is that the resulting data is largely “unbiased” because aerial photography is relatively independent of local data-collection capabilities and political interests (Huntington & Wibbels, 2014, p. 640; Herrera & Kapur, 2007). In peripheral and conflict-affected areas like the Amazon region where little infrastructure is present, this advantage makes a clear difference.

Academic interest in remote sensing is steadily increasing and the technique will likely become an important part of the “data-rich future of the social sciences” (King, 2011). Political science is no exception, even though scholars in the discipline have barely explored the wide array of existing sensors (see Table A1). Some political scientists have used data on nighttime lighting produced by the Defense Meteorological Satellite Program’s Operational Linescan System (DMSP-OLS) to measure concepts like

---

186 See Min (2015, Chapter 4) for an interesting discussion of bias in remote sensing.
187 Scholars in the social sciences have relied on remote sensing to study topics like economic development (Chen, 2016) and violence (Witmer, 2015). See, in addition, Donaldson and Storeygard (2016) for an enlightening review of remote sensing in economics.
electricity provision, state capacity, and economic development. For instance, Brian Min, a pioneer in the use of satellite images in political science, employs nighttime lighting patterns to study electricity provision, which is a concrete public good that governments often provide (Min, 2015; Min, Gaba, Sarr, & Agalassou, 2013; Min & Gaba, 2014; Min & Golden, 2014). Similar data was used by Hollenbach et al. (2012) and Harbers (2015) to measure state capacity in Africa and Ecuador, respectively. To be sure, Harbers did not directly measure state capacity with satellite images. Instead, she built a complex index for subnational state capacity that combined indicators for collected taxes and economic development, the latter measured using remote sensing techniques. These examples raise concerns that the utility of satellite imagery in political science largely depends on its validity when it comes to capturing the concepts and phenomena that scholars purport to measure.

On the basis of the above introductory discussion, the following paragraphs describe the most important methodological decisions that went into constructing this dissertation’s original geo-database of cumulative deforestation.

**Sensor Selection.** We utilized data from the Landsat program, the longest-running satellite imaging project offering free access to collected images with a moderate spatial resolution. Landsat is a joint program of the U.S. National Aeronautics and Space Administration (NASA) and the USGS that provides remote sensing data for the entirety

---

188 Furthermore, Table A1 is useful to illustrate that the DMSP-OLS has a coerce spatial resolution (2700m). Sensors with moderate (e.g., Landsat) and fine spatial resolutions have rarely been used in political science.

189 Since the Ecuadorian government did not provide data on economic development by locality, she used nighttime lighting patterns as a proxy for economic development (Harbers, 2015).
of the Earth’s surface. Between 1972 and 2019, Landsat took a picture of each region of
the Earth approximately every two weeks, producing more than twenty images per year
per region over that period. When open access to Landsat’s data was granted in 2008, its
archives contained more than 2 million images (Woodcock et al., 2008). The new data
policy triggered a dramatic increase in the use of Landsat data: while only 3,000 images
were purchased in the best month prior to 2008, an average of 250,000 images per month
were distributed between 2008 and 2012 (Wulder, Masek, Cohen, Loveland, &
Woodcock, 2012, p. 5).

Furthermore, most scholarly publications on land use and land cover utilize
Landsat imaginary due to its moderate spatial resolution, that is, the size of the smallest
spatial unit that an image is able to represent. Table A1 presents different sensors and
classifies them according to spatial resolution: very fine, fine, moderate, and coarse.
Images with very fine and fine spatial resolution capture more detail. However, fine
resolution also means that more images are necessary to cover the same land area and
that image processing consumes additional time. More importantly, highly detailed
images are often neither free, historical, nor constant over time. Landsat, which captures
land-use changes larger than 30 meters (spatial resolution) and smaller than a hectare,
offers a welcome balance between detailed-but-costly and free-but-coarse images.
Landsat’s spatial resolution “is fine enough to detect and monitor anthropogenic changes
in land cover, while at the same time having an imaging footprint that is sufficiently large
to enable wide-area applications” (Wulder et al., 2012, p. 3).
Landsat has launched eight satellite missions, which are typically identified by their numbers: Landsat 1 (1972-1978), Landsat 2 (1975-1982), Landsat 3 (1978-1983), Landsat 4 (1982-1993), Landsat 5 (1984-2013), Landsat 6 (1993), Landsat 7 (1999-), and Landsat 8 (2013-). The technical characteristics of these missions have markedly improved over time and, as a result, more recent Landsat images tend to be of higher spatial, radiometric, spectral and temporal quality than older ones.

**Study area and image selection.** Relevant images were identified using Landsat’s Worldwide Reference System (WRS), which allows users to find images of any part of the world by entering unique path and row numbers (e.g., 8-59). Figure 3.7 included images for the row and path numbers covering the “arc of deforestation” in the

---

**Table A1**

**Sensors by Spatial Resolution**

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Spatial resolution (m)</th>
<th>Revisit (days)</th>
<th>Swath width (km)</th>
<th>Spectral bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very fine spatial resolution (≤1 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QuickBird</td>
<td>0.6</td>
<td>3–4</td>
<td>30</td>
<td>Pan</td>
</tr>
<tr>
<td>WorldView</td>
<td>0.5</td>
<td>2–4</td>
<td>18</td>
<td>Pan</td>
</tr>
<tr>
<td>IKONOS</td>
<td>0.8</td>
<td>2–3</td>
<td>11</td>
<td>Pan</td>
</tr>
<tr>
<td>GeoEye</td>
<td>0.5</td>
<td>2–3</td>
<td>10</td>
<td>Pan</td>
</tr>
<tr>
<td>Fine spatial resolution (1–10 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GeoEye</td>
<td>1.6</td>
<td>2–3</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>QuickBird</td>
<td>2.4</td>
<td>3–4</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>SPOT</td>
<td>2.5</td>
<td>5–26</td>
<td>60</td>
<td>Pan</td>
</tr>
<tr>
<td>IKONOS</td>
<td>3.2</td>
<td>2–3</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>IRS LISS 4</td>
<td>6</td>
<td>5</td>
<td>25, 70</td>
<td>5</td>
</tr>
<tr>
<td>Moderate spatial resolution (10–250 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPOT</td>
<td>10, 20</td>
<td>5–26</td>
<td>60</td>
<td>4</td>
</tr>
<tr>
<td>IRS LISS 3</td>
<td>6, 23, 70</td>
<td>24</td>
<td>70, 140</td>
<td>5</td>
</tr>
<tr>
<td>Landsat</td>
<td>15, 30, 60, 120</td>
<td>16</td>
<td>185</td>
<td>7</td>
</tr>
<tr>
<td>Coarse spatial resolution (&gt;250 m)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MODIS</td>
<td>250, 500, 1000</td>
<td>1–2</td>
<td>2330</td>
<td>36</td>
</tr>
<tr>
<td>AVHRR</td>
<td>1100, 4400</td>
<td>0.5–1</td>
<td>2500</td>
<td>5, 6</td>
</tr>
<tr>
<td>DMSP-OLS</td>
<td>2700</td>
<td>0.25</td>
<td>3000</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: Pan, panchromatic.

Source: Reprinter from Witmer (2015, p. 2328)
Colombian Amazon. As that figure suggests, a single mosaic required ten images with path numbers from 6 to 9 and row numbers from 58 to 60. As a result, at least fifty images were downloaded from the USGS’s website in order to build five mosaics of ten images from the mid-1970s to the present (see Figure A1).

*Figure A1. Five mosaics of ten Landsat images per decade*

Images were carefully selected in order to ensure that cloud cover did not pose a problem and that they were temporally proximate. An ideal mosaic is one constructed from ten images taken at roughly the same time and not covered by clouds. However, this standard was almost impossible to meet for tropical rainforests, where clouding is not only a technical problem but also the main source of “missing data.” For this reason, we privileged low clouding over temporal proximity. Although we are aware that a region can change significantly in the span of a single year, and that the quality of data can vary between wet and dry seasons, we considered the problem secondary when compared to pervasive clouding. We thus downloaded images with less than 10% cloud cover, which meant working with images that were not taken during the same year or season. An
important consequence of this decision was that not every image in a particular mosaic was taken during the same year and/or by the same Landsat mission. Despite this limitation, it is worth recognizing that we consciously tried to download images that were taken during dry seasons when clouding was low.

**Image processing.** After obtaining the initial data, we undertook the time-consuming task of processing the images, which involved three procedures: radiometric correction, geometric correction, and resampling (see Table A2 below). Radiometric correction is used to correct for data loss, remove haze, and enable both comparison and mosaicking (Chuvieco, 2015). It removes atmospheric noise and improves the fidelity of the image. Second, geometric correction links the image to ground coordinates in order to remove possible deviations. The procedure is crucial for mapping, mosaicking, and multi-temporal comparisons.\(^{190}\) Finally, resampling is the process of automatically transforming the spatial resolution of an image.

Table A2 shows that not every image was equally processed because the initial quality of the images was not the same. Given the high quality of images taken after the year 2000, processing those images was unnecessary. By contrast, we applied both radiometric and geometric correction to images taken in the 1970s, 1980s, and 1990s. Finally, every image taken in the 1970s was resampled in order to modify its spatial resolution from 60m to 30m.\(^{191}\) Table A2 thus shows both the most important

---

\(^{190}\) Geometric correction requires a geo-corrected baseline, which was kindly provided by the IGAC. The uncorrected image’s data pixels are related to the ground locations of the corrected, baseline image.

\(^{191}\) One of the most common resampling methods is called the *nearest neighbor*, which creates a new pixel based on the characteristics of the closest pixels from the old grid.
The characteristics of each downloaded image (i.e., path and row, date, Landsat mission, and identification number) and the executed processing procedures per image.

**Table A2**  
Image Characteristics and Processing

<table>
<thead>
<tr>
<th>Decade</th>
<th>Path / Row</th>
<th>Date (mm/dd/aa)</th>
<th>Landsat</th>
<th>ID</th>
<th>Radiometric Correction</th>
<th>Geometric Correction</th>
<th>Resampling</th>
<th>Error (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1980</td>
<td>6-58</td>
<td>2/4/73</td>
<td>1</td>
<td>LM10060581973035AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-59</td>
<td>2/4/73</td>
<td>1</td>
<td>LM10060591973035AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-58</td>
<td>10/2/72</td>
<td>1</td>
<td>LM10070581972276AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-59</td>
<td>10/2/72</td>
<td>1</td>
<td>LM10070591972276AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-60</td>
<td>10/2/72</td>
<td>1</td>
<td>LM10070601972276AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-58</td>
<td>1/7/77</td>
<td>2</td>
<td>LM200805819777007AAA04</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-59</td>
<td>10/17/78</td>
<td>2</td>
<td>LM20080591978290AAA02</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-60</td>
<td>10/17/78</td>
<td>2</td>
<td>LM20080601978290AAA02</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-59</td>
<td>2/1/76</td>
<td>2</td>
<td>LM20090591976032AAA04</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-60</td>
<td>2/3/79</td>
<td>2</td>
<td>LM20090601979034AAA05</td>
<td>±15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980-1990</td>
<td>6-58</td>
<td>1/4/88</td>
<td>4</td>
<td>LT40060581988004XXX09</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-59</td>
<td>1/4/88</td>
<td>4</td>
<td>LT40060591988004XXX11</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-58</td>
<td>1/11/88</td>
<td>4</td>
<td>LT40070581988011XXX08</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-59</td>
<td>1/11/88</td>
<td>4</td>
<td>LT40070591988011XXX04</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-60</td>
<td>1/3/88</td>
<td>5</td>
<td>LT50070601988003CUB00</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-58</td>
<td>1/2/88</td>
<td>4</td>
<td>LT40080581988002XXX10</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-59</td>
<td>1/2/88</td>
<td>4</td>
<td>LT40080591988002XXX11</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-60</td>
<td>1/23/87</td>
<td>5</td>
<td>LT50080601987023XXX01</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-59</td>
<td>10/13/87</td>
<td>5</td>
<td>LT50090591987286XXX01</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-60</td>
<td>8/23/86</td>
<td>5</td>
<td>LT50090601986235AAA08</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990-2000</td>
<td>6-58</td>
<td>8/19/98</td>
<td>5</td>
<td>LT50060581998231XXX02</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-59</td>
<td>8/19/98</td>
<td>5</td>
<td>LT50060591998231XXX02</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-58</td>
<td>9/27/98</td>
<td>5</td>
<td>LT50070581998270XXX02</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-59</td>
<td>9/27/98</td>
<td>5</td>
<td>LT50070591998270XXX02</td>
<td>±0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decade</td>
<td>Path / Row</td>
<td>Date (mm/dd/aa)</td>
<td>Landsat</td>
<td>ID</td>
<td>Radiometric Correction</td>
<td>Geometric Correction</td>
<td>Resampling</td>
<td>Error (m)</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-----------------</td>
<td>---------</td>
<td>------------------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td>7-60</td>
<td>9/27/98</td>
<td>5</td>
<td>LT50070601998270XXX02</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-58</td>
<td>6/30/98</td>
<td>5</td>
<td>LT50080581998181XXX02</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-59</td>
<td>6/30/98</td>
<td>5</td>
<td>LT50080591998181XXX02</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-60</td>
<td>6/30/98</td>
<td>5</td>
<td>LT50080601998181XXX02</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-59</td>
<td>7/10/99</td>
<td>5</td>
<td>LT50090591999191XXX06</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-60</td>
<td>7/10/99</td>
<td>5</td>
<td>LT50090601999191XXX06</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-60</td>
<td>10/4/09</td>
<td>5</td>
<td>LT50060582009277CUB00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-58</td>
<td>2/1/07</td>
<td>5</td>
<td>LT50060592007032CUB00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-58</td>
<td>9/9/09</td>
<td>5</td>
<td>LT50070582009252CHM00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-59</td>
<td>12/27/08</td>
<td>5</td>
<td>LT50070592008362CUB00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-60</td>
<td>8/21/08</td>
<td>5</td>
<td>LT50070602008234CUB00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-58</td>
<td>9/27/07</td>
<td>5</td>
<td>LT50080582007270CHM00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-59</td>
<td>8/31/09</td>
<td>5</td>
<td>LT50080592009243CHM00</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-60</td>
<td>8/31/09</td>
<td>5</td>
<td>LT50080602009243CUB01</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-59</td>
<td>10/4/07</td>
<td>5</td>
<td>LT50090592007277CHM01</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-60</td>
<td>10/4/07</td>
<td>5</td>
<td>LT50090602007277CHM01</td>
<td>±0,5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-58</td>
<td>2/12/17</td>
<td>8</td>
<td>LC80060582017043LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-59</td>
<td>1/25/16</td>
<td>8</td>
<td>LC80060592016025LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-58</td>
<td>1/16/16</td>
<td>8</td>
<td>LC80070582016016LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-59</td>
<td>2/1/16</td>
<td>8</td>
<td>LC80070592016032LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-60</td>
<td>2/1/16</td>
<td>8</td>
<td>LC80070602016032LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-58</td>
<td>1/4/15</td>
<td>8</td>
<td>LC80080582015004LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-59</td>
<td>3/11/16</td>
<td>8</td>
<td>LC80080592016071LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8-60</td>
<td>3/11/16</td>
<td>8</td>
<td>LC80080602016071LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-59</td>
<td>1/24/14</td>
<td>8</td>
<td>LC80090592014024LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9-60</td>
<td>9/2/13</td>
<td>8</td>
<td>LC80090602013245LGN00</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Image classification.** After downloading and processing the images, we proceeded to classify different types of land cover. Image classification is the manual or automatic process by which information about land cover is extracted from raw images (Chuvieco, 2015). Image classification could be manual or automatic. The former is the process in which a research team draws a polygon based on the characteristics of an image (e.g., color, texture, shadows) and assigns a particular type of land cover to it. When the area of study is small or the research team is large enough, images can be classified manually, which is still the best procedure. However, when the area of study is large and resources are limited, as in my case, image classification is only possible thanks to an automatic process in which the pixels of an image (initially stored in a raster format) are automatically grouped into different types of land cover.

Specifically, the images for this project were analyzed through “supervised classification,” a process that combines automatic processing with researcher supervision. The latter involves manual determination of the values representing each type of land cover through the collection of spectral signatures (technically defined as the variation of reflectance). We decided to classify each pixel into three broad land cover classes: forestland, non-forest land, and clouding. To that end, a random sample of 180 pixels per image 60 per type of land cover was selected in order to collect the intervals of spectral signatures. Based on these spectral signatures, a signature file was created for each image. This file, which matched the spectral signatures of the sample of pixels with

---

192 A large number of spectral signatures contributes to the adequate classification of each type of land cover. For example, different forests with different levels of humidity need to be identified so that they can be classified as the same land cover.
the three types of land cover, constituted the main input for the classification algorithm known as Spectral Angle Mapper (SAM) implemented in ENVI image analysis software.\textsuperscript{193}

**Generalization.** Maps are simplifications of reality and generalization is the process through which details are deliberately lost. Given the importance of generalization, transparency about methodological decisions and technical procedures is crucial (Monmonier, 1996). Every processed image was full of details at first, which made computing and processing them difficult. Because pixels were classified according to the 180 spectral signatures per image, each classified image initially contained approximately three million data points on average. Different filters were applied to reduce this complexity. Figure A2 illustrates the results of the first filter, which calculates an average based on pixel neighbors. While the left-hand image shows the initial classification, the right-hand image shows the result following the implementation of neighborhood functions (filter 7x7) in the ERDAS IMAGE software.

\textsuperscript{193} In theory, the association between spectral signatures and types of land cover should be checked in the field in order to determine if the signature corresponds with the land cover on the ground. We were unable to implement this procedure because it is costly and time consuming.
After applying this filter, we converted the images from raster (images) to vector data (polygons). Given that each image still contained more than one million data points on average, additional generalization was necessary. To this end, we determined a minimum mapping unit, that is, the smallest area that the dataset will contain, which we set at 15 hectares.\textsuperscript{194} As a result, polygons smaller than 15 hectares were eliminated from the database (using the Eliminate tool in ArcGIS) and merged with neighboring polygons that had the largest area or the largest shared border. The choice of the minimal mapping unit carried a significant implication: because coca crops are usually small with areas between 1 and 5 hectares—produced data was not fully capable of representing them (Ciro, 2016; Vargas, 2003). If a small area of coca cultivation was surrounded by forests, that area was likely generalized as forested land. Similarly, small forest patches surrounded by farming areas were likely generalized as non-forested land.

\textsuperscript{194} This unit is smaller than the minimum unit used by the methodology of Corine Land Cover.
Finally, in addition to applying these two generalization procedures (filters), we dissolved adjacent polygons of the same class into a single polygon (see Figure A3).

![Vector data with adjacent polygons](image1)
![Vector data without adjacent polygons](image2)

**Figure A3.** The dissolution of adjacent polygons of the same class

**Quality control.** Last but not least, we conducted quality control by carefully comparing the original image with the resulting classification and transformation into vector data. When the classification of land cover was not accurate and the quality of the image was high, a completely new supervised classification was performed and every step of the aforementioned procedure, including quality control, was repeated. When the quality of the image was low, new images were downloaded with the aim of replacing the entire image or the specific parts that were damaged or covered by clouds. In simpler terms, the substitution of images was total or partial depending on the overall quality of the initial image.

Partial substitutions were implemented when the overall quality of the image and the initial classification was high, but clouding was still a problem. Clouding was manually removed with this procedure from historically active deforestation fronts.
with altitudes below 1000 meters. A conscious effort was made to guarantee that contemporary non-forested areas were cloud-free in every mosaic. Figure A4 presents an example of the technical procedure. First, a polygon was drawn on the initial image in order to determine the area that needed to be replaced (A), then a second image of the same area on a different date but without clouding was downloaded and processed (B), and finally a new image was created by spatially combining these two images (A + B).

Figure A4. The substitution of partial clouding

---

195 Clouding in the highlands was considered less problematic because deforestation literature has demonstrated that it tends to be low there.
Multi-temporal analysis and the identification of cumulative change. Once the five mosaics of land cover were independently constructed, we analyzed land cover changes. We first classified as “no data” those areas that were classified as missing data in at least one mosaic. We then identified areas that were non-forested or forested in every mosaic. These areas were treated as constants because they did not change over time. Finally, the analysis compared the five decades in chronological pairs in order to identify two broad types of multi-temporal changes: forest loss from forest cover to a different type of land cover and forest regrowth from non-forested land to forest cover.

Calculating deforestation, for example, required spatially correlating forested land in the initial year with non-forest cover in the final year. The procedure was implemented by pairing two decades at a time.

Finally, these separate multi-temporal analyses were transformed to represent cumulative transformations over the entire five-decade period. Areas were classified as “non-cumulative changes” when land cover changed in different directions over time (e.g., forest loss, forest regrowth, and forest loss). By contrast, areas in which forests were lost and never recovered were classified as “cumulative deforestation.” Similarly, areas with forest gain and without posterior loss were classified as “cumulative forest regrowth.” The final database included four constants (forest, non-forest, no data, and non-cumulative change) and two variables (cumulative regrowth and cumulative deforestation) for each of four multi-temporal changes (1970s-1980s; 1980s-1990s: 1990s-2000s; 2000s-2010s).
As a result of the process described in this appendix, five mosaics were constructed from at least fifty Landsat images. The technique used to produce this data, remote sensing, is common in the deforestation literature and the earth sciences but relatively uncommon in political science. Because remote sensing is remote, the information gathered through satellite images should be taken as a simple starting point for understanding complex phenomena on the ground.
APPENDIX B. HISTORICAL ARCHIVES

Digital Archives


Archives

Administrative Department of Intendancies and Commissariats (DAINCO). General Archive of the Nation. Bogotá.

Corporation for Sustainable Development in the Southern Amazon (CORPOAMAZONIA). Documentation Center. Mocoa, Putumayo.

Ecos del Maguare (1963-1983). Caquetá’s newspaper. Access to this historical archive was possible thanks to Andrés Eduardo Baquero. Florencia, Caquetá.

The Office of the Governor of Caquetá. Secretaries of Agriculture, Planning and Infrastructure. Florencia, Caquetá.
APPENDIX C. IN-DEPTH INTERVIEWS

In-depth interviews were part of a multi-method research strategy that also included analysis of Landsat satellite images, historical archives, and secondary sources. This multi-pronged strategy benefited from the strengths and helped mitigate the weaknesses of in-depth interviews (Lynch, 2013, p. 22). The latter assisted me in generating a set of empirically-grounded hypotheses and in orienting my process of data collection. For example, interviewees repeatedly highlighted the strong connection between deforestation and the formal and informal conditions that regulate access to credit and public land. On the basis of these interviews, I searched for official information about credit and public land in the Amazon. Although Chapters 5 and 6 explain how these two elements can help account for varied levels of cumulative deforestation, the data employed in support of the argument did not consist of the interviews themselves. Similarly, in constructing my analysis of regional symbolism (the moral economy of Amazon deforestation) in Chapter 6, interviews informed my understanding of that phenomenon but were not my most significant data source.

Because one of the main goals of this dissertation was to examine the environmental consequences of economic and political integration over time, I focused on the developmental epicenters of my two departments of interest. I first carried out interviews in the two capital cities Florencia and Mocoa where the most influential universities, state agencies, and social organizations are located. In these cities, I gained a broad overview of the phenomenon I hoped to study and located additional interviewees
in the other municipalities of each department. I then visited municipalities that were both active centers of population and commerce and located near the agricultural frontier. I carried out in-depth interviews in the municipalities of San Vicente del Caguán, Belén de los Andaquíes, San José del Fragua, and Florencia in Caquetá and Puerto Asís, Valle del Guamuéz, Orito, and Mocoa in Putumayo. Although I did not visit every municipality in Caquetá and Putumayo, on the basis on my interviews I believe that my generalizations about the two departments are not only accurate but also sensitive to internal differences. In addition, I carried out interviews with experts and crucial informants in Bogotá, Neiva, and Pasto: the capital of Colombia and the capitals of the two departments closest to the Amazon piedmont.

In all of the above-mentioned municipalities, I carried out more than 90 in-depth interviews, attended local meetings, and took detailed field notes on regional development dynamics. Because my interviewees were not randomly selected, I recognize that my ability to generalize about broader populations is necessarily limited. My goal was simply to generate hypotheses about the underlying drivers of cumulative deforestation in the Colombian Amazon that could be tested in the future using alternative sampling techniques or sources of data.

Convenience sampling, a particular type of non-random sampling, was my only option if I hoped to understand the complexity of Amazon deforestation in light of the constraints of conducting interviews in a region that was deeply affected by violence (Ciro, 2016; Cohen & Arieli, 2011). My sampling frame was comprised of bureaucrats working for state agencies in charge of infrastructure investments, agricultural
development, and environmental protection. Similarly, I searched for social leaders who were directly involved in the promotion of agricultural development or environmental protection. I also talked to experts and historians of each region. These three types of interviewees were chosen through snowball sampling, in which new respondents are located using the recommendations of earlier interviewees (Lynch, 2013, pp. 27–29). Interviews lasted for an average of 90 minutes and were rarely recorded.

In addition to the above discussion of the role of in-depth interviews in my research strategy, this Appendix provides a list of interviews. Because I promised not to disclose the identities of my interviewees, the list omits their names and other identifying information. Promising anonymity was necessary to ensure my respondents that their answers would not create additional risks for them. It was a reasonable decision given the massive violence the region has experienced, and also because I had few prior connections in the visited municipalities (McLean, 2013). The following list provides the identification number of each interview (employed throughout the text), the occupation of the interviewee, and the date and location of the interview.

Table C1
List of interviews

<table>
<thead>
<tr>
<th>ID</th>
<th>Occupation</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Farmer</td>
<td>14/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
<tr>
<td>2</td>
<td>Rancher</td>
<td>23/04/2016</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>3</td>
<td>Farmer</td>
<td>14/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
</tbody>
</table>

1 Conflict zones pose particular challenges for field research. See Wood (2006) on some of the most important ethical dilemmas, Cohen and Arieli (2011) on the limitations of random sampling, and Ciro (2016) on the benefits of good quality ethnographic work.
<table>
<thead>
<tr>
<th>ID</th>
<th>Occupation</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>State official</td>
<td>2/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>5</td>
<td>State official</td>
<td>8/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>6</td>
<td>Political leader</td>
<td>23/09/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>7</td>
<td>Merchant</td>
<td>16/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>8</td>
<td>Merchant</td>
<td>19/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>9</td>
<td>Merchant</td>
<td>21/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>10</td>
<td>Rancher and farmer</td>
<td>9/02/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>11</td>
<td>Merchant</td>
<td>22/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>12</td>
<td>Merchant</td>
<td>7/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>13</td>
<td>Former state official of the UAESPNN</td>
<td>6/09/2018</td>
<td>Bogotá</td>
</tr>
<tr>
<td>14</td>
<td>State official</td>
<td>26/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>15</td>
<td>Political leader</td>
<td>24/09/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>16</td>
<td>State official</td>
<td>2/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>17</td>
<td>State official</td>
<td>4/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>18</td>
<td>Social leader</td>
<td>25/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>19</td>
<td>Social leader</td>
<td>29/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>20</td>
<td>Rancher</td>
<td>24/09/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>21</td>
<td>Social leader</td>
<td>29/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>22</td>
<td>Political leader</td>
<td>24/05/2018</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>23</td>
<td>Farmer</td>
<td>21/04/2016</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>24</td>
<td>Political leader</td>
<td>25/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>25</td>
<td>Social leader</td>
<td>30/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>26</td>
<td>Social leader</td>
<td>9/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>27</td>
<td>Rancher</td>
<td>17/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>28</td>
<td>Rancher</td>
<td>21/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>29</td>
<td>Rancher</td>
<td>20/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>30</td>
<td>Rancher</td>
<td>22/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>31</td>
<td>Political leader</td>
<td>10/10/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>32</td>
<td>Farmer</td>
<td>25/04/2016</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>33</td>
<td>Rancher</td>
<td>1/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>34</td>
<td>Merchant</td>
<td>15/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
<tr>
<td>35</td>
<td>Judicial officer</td>
<td>17/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>36</td>
<td>Judicial officer</td>
<td>2/10/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>37</td>
<td>State official</td>
<td>15/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>38</td>
<td>State official</td>
<td>17/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>39</td>
<td>State official</td>
<td>25/09/2015</td>
<td>Caquetá, San Vicente del Caguán</td>
</tr>
<tr>
<td>ID</td>
<td>Occupation</td>
<td>Date</td>
<td>Location</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------</td>
<td>-----------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>40</td>
<td>Farmer</td>
<td>16/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
<tr>
<td>41</td>
<td>State official</td>
<td>16/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
<tr>
<td>42</td>
<td>State official</td>
<td>16/02/2016</td>
<td>Putumayo, Valle del Guamuéz</td>
</tr>
<tr>
<td>43</td>
<td>Farmer</td>
<td>7/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>44</td>
<td>Historian</td>
<td>20/02/2016</td>
<td>Putumayo, Mocoa</td>
</tr>
<tr>
<td>45</td>
<td>State official</td>
<td>21/02/2016</td>
<td>Putumayo, Mocoa</td>
</tr>
<tr>
<td>46</td>
<td>Former director of INCORA</td>
<td>20/02/2016</td>
<td>Putumayo, Mocoa</td>
</tr>
<tr>
<td>47</td>
<td>Former state official of the INCORA</td>
<td>17/06/2017</td>
<td>Huila, Neiva</td>
</tr>
<tr>
<td>48</td>
<td>State official of the Picachos National Park</td>
<td>19/06/2017</td>
<td>Huila, Neiva</td>
</tr>
<tr>
<td>49</td>
<td>Social leader</td>
<td>13/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>50</td>
<td>State official of the INCORA</td>
<td>19/02/2016</td>
<td>Putumayo, Mocoa</td>
</tr>
<tr>
<td>51</td>
<td>Farmer</td>
<td>12/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>52</td>
<td>Farmer</td>
<td>13/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>53</td>
<td>Political leader</td>
<td>6/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>54</td>
<td>Social leader</td>
<td>10/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>55</td>
<td>Merchant</td>
<td>13/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>56</td>
<td>Social leader</td>
<td>10/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>57</td>
<td>Farmer</td>
<td>11/02/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>58</td>
<td>State official</td>
<td>8/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>59</td>
<td>State official</td>
<td>9/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>60</td>
<td>State official</td>
<td>10/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>61</td>
<td>State official</td>
<td>10/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>62</td>
<td>State official</td>
<td>12/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>63</td>
<td>Judicial officer</td>
<td>10/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>64</td>
<td>Judicial officer</td>
<td>11/12/2015</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>65</td>
<td>Judicial officer</td>
<td>13/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>66</td>
<td>Judicial officer</td>
<td>12/02/2016</td>
<td>Putumayo, Puerto Asís</td>
</tr>
<tr>
<td>67</td>
<td>Former director of INCORA</td>
<td>10/10/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>68</td>
<td>Employee of a non-governmental organization</td>
<td>15/03/2017</td>
<td>Bogotá</td>
</tr>
<tr>
<td>69</td>
<td>Employee of a non-governmental organization</td>
<td>17/03/2017</td>
<td>Bogotá</td>
</tr>
<tr>
<td>70</td>
<td>Former state official at UAESPNN</td>
<td>12/06/2016</td>
<td>Bogotá</td>
</tr>
<tr>
<td>71</td>
<td>Former governor of Caquetá</td>
<td>11/08/2017</td>
<td>Bogotá</td>
</tr>
<tr>
<td>72</td>
<td>Journalist</td>
<td>23/09/2015</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>ID</td>
<td>Occupation</td>
<td>Date</td>
<td>Location</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>73</td>
<td>Farmer</td>
<td>22/05/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>74</td>
<td>Rancher</td>
<td>19/04/2016</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>75</td>
<td>Social leader</td>
<td>23/05/2018</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>76</td>
<td>State official</td>
<td>23/05/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>77</td>
<td>State official</td>
<td>23/05/2018</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>78</td>
<td>Farmer</td>
<td>24/05/2018</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>79</td>
<td>Transporter</td>
<td>27/07/2017</td>
<td>Nariño, Pasto</td>
</tr>
<tr>
<td>80</td>
<td>Historian</td>
<td>28/07/2017</td>
<td>Nariño, Pasto</td>
</tr>
<tr>
<td>81</td>
<td>Social leader</td>
<td>25/04/2016</td>
<td>Caquetá, Belén de los Andaquíes</td>
</tr>
<tr>
<td>82</td>
<td>Social leader</td>
<td>27/04/2016</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>83</td>
<td>Historian</td>
<td>20/04/2016</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>84</td>
<td>State official of the Chiribiquete National Park</td>
<td>20/04/2016</td>
<td>Caquetá, Florencia</td>
</tr>
<tr>
<td>85</td>
<td>Social leader</td>
<td>6/09/2018</td>
<td>Bogotá</td>
</tr>
<tr>
<td>86</td>
<td>Indigenous leader</td>
<td>7/02/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>87</td>
<td>State official of the Alto Fragua Indiwasi National Park</td>
<td>8/02/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>88</td>
<td>State official of the Alto Fragua Indiwasi National Park</td>
<td>21/05/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>89</td>
<td>Farmer</td>
<td>12/02/2018</td>
<td>Caquetá, San José del Fragua</td>
</tr>
<tr>
<td>90</td>
<td>State official of the Alto Fragua Indiwasi National Park</td>
<td>8/05/2018</td>
<td>Bogotá</td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


Diario del Huila. (1979a, September 1). *Nueva delimitación de fronteras entre Caquetá y Meta*.

Diario del Huila. (1979b, December 13). *En el 80 el Caquetá será departamento*.


IGAC. (1993). *Aspectos ambientales para el ordenamiento territorial del occidente del Departamento del Caquetá*. Colombia: IGAC.

IGAC. (2014). *Estudio general de suelos y zonificación de tierras: Departamento de Caquetá*. Bogotá: IGAC.


PNUD. (2014). Construcción de una paz territorial estable, duradera y sostenible en Colombia.


