SEEDS OF POWER

Amalia Leguizamón

Environmental Injustice and Genetically Modified Soybeans in Argentina

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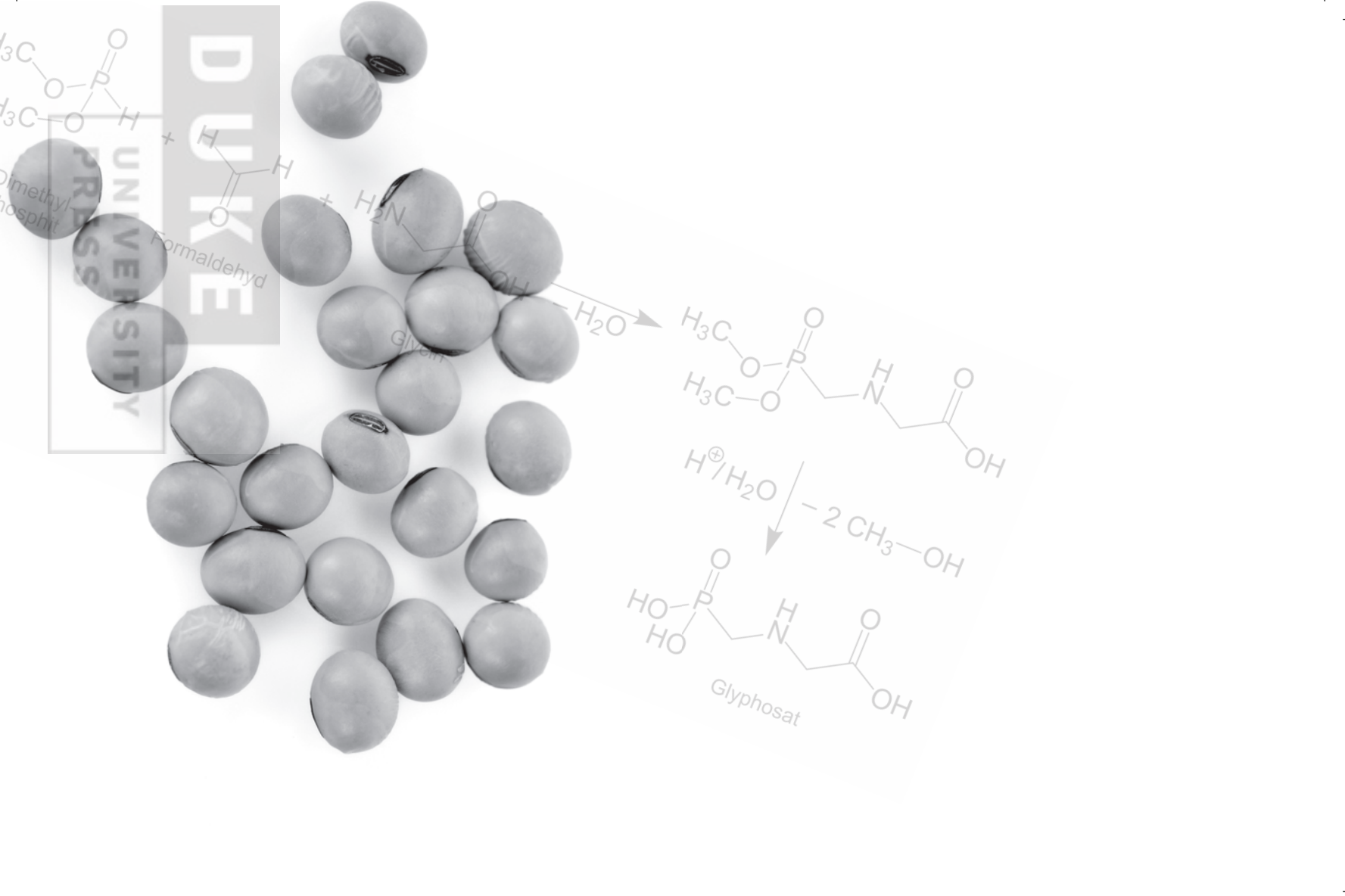
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Duke University Press Durham and London 2020

Printed in the United States of America on acid-free paper ∞
Designed by Courtney Leigh Richardson
Typeset in Whitman and Helvetica Neue by Westchester Publishing Services

Library of Congress Cataloging-in-Publication Data
Names: Leguizamón, Amalia, [date] author.
Title: Seeds of power : environmental injustice and genetically modified soybeans in Argentina / Amalia Leguizamón.
Description: Durham : Duke University Press, 2020. | Includes bibliographical references and index.
Identifiers: LCCN 2019054743 (print)
LCCN 2019054744 (ebook)
ISBN 9781478009788 (hardcover)
ISBN 9781478010852 (paperback)
ISBN 9781478012375 (ebook)
Subjects: LCSH: Soybean—Genetic engineering—Environmental aspects—Argentina. | Transgenic plants—Economic aspects—Argentina. | Agricultural biotechnology—Environmental aspects—Argentina. | Agricultural biotechnology—Social aspects—Argentina. | Genetically modified foods—Social aspects—Argentina. | Environmental policy—Argentina.
Classification: LCC HD9235.S62 A744 2020 (print) | LCC HD9235.S62 (ebook) | DDC 338.1/73347—dc23
LC record available at https://lccn.loc.gov/2019054743
LC ebook record available at https://lccn.loc.gov/2019054744

COVER ART: *Soybeans*. © Prani Teiyng Ketu / EyeEm. Courtesy Getty Images. Structural formula for glyphosate synthesis.

Duke University Press gratefully acknowledges Tulane University's School of Liberal Arts, which provided funds toward the publication of this book.

For my parents,

Mirta and Osvaldo

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ACRONYMS

AAPRESID	Asociación Argentina de Productores en Siembra Directa (Argentine Association of Direct Sowing Producers)
AMLV	Asamblea Malvinas Lucha por la Vida
CASAFE	Cámara de Sanidad Agropecuaria y Fertilizantes (Argentine Association of Agrochemical Companies)
CEPAL	Comisión Económica para Latinoamérica y el Caribe (Economic Commission for Latin America and the Caribbean [ECLAC])
CIARA	Cámara de la Industria Aceitera de la República Argentina (Argentine Oilseed Industry Chamber)
CNA	Censo Nacional Agropecuario (Argentina's National Rural Census)
CONICET	Consejo Nacional de Investigaciones Científicas y Técnicas (National Council for Scientific and Technological Research)
CREA	Consorcios Regionales de Experimentación Agrícola (Regional Consortiums of Agricultural Experimentation)
EJ	environmental justice
EPA	US Environmental Protection Agency
FAO	Food and Agriculture Organization of the United Nations
FDA	US Food and Drug Administration
GM/GMO	genetically modified / genetically modified organisms

IASCAV	Instituto Argentino de Sanidad y Calidad Vegetal (Argentine Institute for Plant Health and Quality)
INDEC	Instituto Nacional de Estadística y Censos de la República Argentina (National Institute of Statistics and Census)
INTA	Instituto Nacional de Tecnología Agropecuaria (National Agricultural Technology Institute)
ISAAA	International Service for the Acquisition of Agri-biotech Applications
MOCASE	Movimiento Campesino de Santiago del Estero (Peasant Movement from Santiago del Estero)
RR	Roundup Ready (Monsanto's herbicide-resistant crops)
SENASA	Servicio Nacional de Sanidad y Calidad Agroalimentaria (National Service for Sanitation and Food Quality)
UPOV 78	1978 Convention of the Union for the Protection of New Plant Varieties
USDA	US Department of Agriculture
WHO	World Health Organization

ACKNOWLEDGMENTS

The seeds for this book were planted in 2008, when I took my first graduate-level course in environmental sociology, in the midst of *el conflicto del campo*. In the process I met many like me, struggling with "how to write a dissertation," and later, if that wasn't enough, with "how to write a book." I've learned from each and every conversation and held close every book that I could tell had its origins in a dissertation. I can only say, if that's you too, keep going. *Sí se puede*. Yes, you can.

At the Graduate Center of the City University of New York, Ken Gould was the most generous and supportive mentor a student could ask for. Thank you, Ken, for holding a learning space for being intellectually curious with scholarly rigor, while never losing the urgency of the problems we study and the passion for engaged scholarship. I appreciate that I continue to learn and seek advice from you well after graduation, and from Tammy Lewis too! Thank you both. I am also deeply grateful to Jack Hammond and Bill Kornblum for advice during the long learning and writing process. Thanks to CUNY Graduate Center, the sociology department in particular, and to CUNY School of Professional Studies for funding my graduate school experience.

I feel fortunate and grateful to have found a job and a home at Tulane University in the magical city of New Orleans. Thanks to my colleagues in the sociology department for their guidance and support. David Smilde, Michele Adams, Mimi Schippers, Mariana Craciun, and Camilo Leslie bounced ideas with me and provided crucial feedback on this project. Thanks also to Laura McKinney, Chris Oliver, and, beyond the department, Virginia Oliveros, Eduardo Silva, and Maria Akchurin.

I'm deeply grateful for the support I have received from Tulane University to complete this project. Heartfelt thanks to Tom Reese and the Stone

Center for Latin American Studies and to Ludovico Feoli and the Center for Inter-American Policy and Research. Many thanks to the School of Liberal Arts, the Newcomb Institute, A Studio in the Woods, and the Provost's Office, especially to Ana López. I am also deeply grateful to my Tulane students who, a captive audience, heard me talk about my research and asked me all the difficult and important questions to fine-tune my arguments and my capacity for storytelling.

I want to thank the many brilliant scholars who through the years read ongoing parts of this project and gave me invaluable feedback: Phil McMichael, Rachel Schurman, Sam Cohn, Gerardo Otero, Matthew Schnurr, Brian Dowd-Uribe, Gustavo Oliveira, Susanna Hecht, Linda Farthing, and Nicole Fabricant, as well as the anonymous reviewers of the peer-reviewed articles I have published on this topic. Pablo Lapegna and Shannon Bell read the first full manuscript draft and gave me thorough and insightful feedback. Thank you both, for helping me figure out what I had to say and how to say it better. I'm humbled by your generosity and your kindness.

Thanks to Gisela Fosado, my editor at Duke University Press, for believing in this project and bringing it to fruition. Thank you always for your constant and enthusiastic support. Thanks to Alejandra Mejía for her attentive and thorough assistance in putting the manuscript together. Before I could even think of turning in this manuscript, Anitra Grisales gave me substantial, if not radical, editorial assistance. Anitra, your comments and edits helped move this book (and my voice) to a whole new level: I am forever grateful. Kate Hahn-Madole at Tulane and Kirsteen Anderson helped me fix the citations and bibliography, and Bill Nelson drew the map of Argentina. Thanks to Ellen Goldlust, Lisl Hampton, Courtney Richardson, and everyone at Duke's production and design departments, as well as the copyeditor Christine Dahlin, who made this manuscript look tight and pretty . . . and a physical book! This book is a thousand times better thanks to the comments I received from two no-longer-anonymous reviewers, Javier Auyero and Shannon Bell.

My immense gratitude goes to the people in the field who have opened their homes, farms, and offices and helped me understand what's going on with the technological package of genetically modified soybeans and large-scale agriculture in Argentina. Many of you have asked me to share what I write; I have struggled knowing that this might not be what you were expecting. My wish is that if you eventually read this book, we get to

talk more so I can learn more and better. I have aimed to be truthful and, of course, my writing is my responsibility.

Finally, thanks to my friends and family, who have helped me stay sane, happy, and healthy through this journey, many of whom also volunteered their own friends and family for me to interview. In/from Argentina: Silvina Soria, Virginia Guerstein, Mariana Severini, Laura Lezcano, Adriana Llinares, and Daniela Olivera. In/since New York City: Pilar Ortiz, Amanda Riesman, Yolanda Martín, Laura Limonic, and Antonia Levy. In New Orleans: Virginia Medinilla, Eric Normand, Izabela Steflja, and Timothy and Joan Kimbell. To Luke McEvoy, for your tender and loving care, and the many meals when I had to write, and for reading and re-reading, and then reading and revising some more. To my siblings, nephews and nieces, and to my cousins and aunts. And especially to my parents, Mirta Quattrocchio and Osvaldo Leguizamón. This book is dedicated to them.

INTRODUCTION

"We do the best agriculture in the world."

By "we," Leo meant Argentines. He is an agronomist and a high school teacher at the local agro-technical school. It was December 2009 when I met him in Flores, a small rural town 180 miles east of Buenos Aires. Leo and his wife had moved to the countryside after a lifetime in the capital, looking for a slower pace of life to raise their three little children. Flores is very small, a perfect grid of eight-by-five blocks in the heart of the Pampas, Argentina's famous prairie grasslands, the storied home of roaming *gauchos* and world-class steaks. Compared with Buenos Aires, which at over twelve million people is among the largest cities of the world, Flores may seem like the perfect picture of pastoral living. It is safe and quiet, and neighbors greet each other. Nature surrounds it. The green of the farms blends with people's backyards. Just outside their doors, a vast, unending vista of green stretches to the horizon to meet open blue skies.

This sea of green is soybean farms. In two decades, Argentina has undergone a swift agrarian transformation based on the early adoption and intensive implementation of genetically modified soybeans. These crops have been modified to tolerate spraying with glyphosate-based herbicides, a biotechnology developed and commercialized by Monsanto (now Bayer) as Roundup Ready. Argentina adopted herbicide-resistant soybeans in 1996 as a central part of its national development strategy based on natural resource extraction for exportation. Genetically modified soybeans cover half of Argentina's arable land and represent a third of total exports. After the United States and Brazil, Argentina is the third largest grower and exporter of genetically modified crops. The country's "soy boom" is celebrated at home and abroad for bringing about modernization and economic growth.[1]

Argentina touts the GM soy model as a well-rounded success. In mainstream newspapers, headlines announce record-breaking profits and exclaim, "Only biotechnology can save the world."[2] National development plans have GM biotechnology at their core. State and corporate actors present GM soy as the promised "manna" to solve global hunger and poverty as Argentina reclaims its role as the "granary of the world." In the rural soy towns of the Pampas, people proclaim, "We all live off the countryside," and praise soybean economics. Even urban sectors ally with the rural population when the government proposes to lift export taxes that may limit soybean production.

But while the soy boom has generated economic growth, it has also created tremendous social and ecological harm.[3] Small rural towns like Flores are disappearing as locals migrate to larger rural towns and cities for employment and the amenities of city life. Land has been concentrated in the hands of a few large agribusinesses that farm extensive areas with the help of cutting-edge technology and a comparatively small amount of highly specialized labor. Soybeans have replaced traditional crops, such as wheat and beef, leading to food insecurity. The expansion of the agrarian frontier into the northern Chaco region has prompted rapid and wide-scale deforestation that has devastated ecosystems and threatened livelihoods. Violence against peasant and indigenous families is escalating. The health hazards of agrochemical exposure are also on the rise. Across rural towns, Argentine doctors have documented increasing occurrences of leukemia, cancer, miscarriages, and malformations in newborns.

Throughout the world, GMOs have been met with strong resistance.[4] In Brazil, India, and South Africa, large coalitions of peasants, students, scientists, and consumers have organized to contest GM biotechnology, raising important questions over the impact of genetically modified crops and agrochemical use.[5] In Canada and Mexico, farmers have demanded lawsuits against Monsanto for cases of genetic contamination of their crops.[6] In India, farmers have burned Monsanto's seeds in pyres after escalating debt around seed purchases has driven many to suicide. In France, small farmers have organized to contest GM crops, free trade, and industrial agriculture.[7] Across the European Union, stricter laws to regulate genetically modified crops and agrochemicals have been passed under the principle of precaution. GMOs are banned in France and Germany and are strictly labeled in the United Kingdom.[8] In California, rural workers have organized to defend themselves against the health hazards of pesticide drift on large-

scale industrial farms. Increasingly in the United States, concerned urban sectors have led the organic and food-justice movements' anti-biotech activism.[9]

In contrast, in Argentina there have been no nationally organized campaigns or coalitions against GMOs.[10] While some local movements have emerged to protest the health hazards of agrochemical drift, and peasant-indigenous organizations have been vocal against deforestation and violent dispossession, their urgent demands remain mostly unheard and they have had a difficult time gaining support from the very people who are negatively impacted. Most of the rural folks who live near soy farms have little to no decision-making power over agricultural production and do not profit from GM soy; in fact, they bear the burden of agrochemical exposure on their bodies and in their lives. So why is it that more of them have not mobilized to halt or at least slow down the pace of GM soy expansion? Why, in the face of environmental injustice, where the literature and common sense would lead us to expect it, do people not resist? And why, in striking opposition to the anti-GMO sentiment around the world, is Argentina complacent in the face of the large-scale expansion of GM soy? That is the puzzle this book sets out to solve.

Seeds of Power tells the story of Argentina's swift agrarian transformation based on the early adoption and intensive implementation of genetically modified, herbicide-tolerant soybeans. What this story reveals is how powerful actors are able to gain support for extractivism as a national model for socioeconomic development and promote inaction in the face of environmental injustice. I use the case of GM soy adoption in Argentina to break down what I call the *synergies of power* that create and legitimate human suffering, social inequality, and environmental degradation.

To grasp this critical process, we have to understand the history and shape of Argentina's political economy as well as its national culture. Argentina is a developing country that, since the late nineteenth century, has relied on agrarian exports for foreign income. Like many others on the continent, this Latin American country has been unable to break free of its colonial past as a "nature-exporting" society (as Fernando Coronil has said of Venezuela's oil dependence).[11] Critical to this enduring bind is a neoliberal restructuring program that, in the late twentieth century, loosened regulations to make large-scale GM soy production possible to begin with, and then to make it easier and more profitable. Finally, nontraditional

commodities like soybeans have garnered higher international prices throughout the first decade of the twenty-first century, mostly driven by higher demand from China and India. In this most convenient context, powerful corporate and state actors have promoted GM soy production as a continuation of Argentina's homegrown model for socioeconomic development to the benefit of all, when in reality they are the ones reaping the majority of the political and financial gains.

Here I reveal how a powerful synergy of influential actors—from the state to national and transnational agribusiness to their allies in the media and sciences—have assigned uses and meanings to GM biotechnology that draw from deep-rooted structural and symbolic inequalities; in doing so, they have managed to create acquiescence and diminish the power of social movements that might otherwise have diverted Argentina's development trajectory away from extractivism. Contributing to perspectives on the political economy of the environment, I show how culture, discourse, and national identity are central to the material interests of people in power.[12] These powerful actors use culture to shape and legitimate a political economy that is highly unequal in terms of class, gender, and race. In focusing on this synergy, I expand on environmental justice scholarship to highlight how political and economic *as well as* cultural and symbolic means, mechanisms, and strategies specific (though not unique) to Argentina can generate consent and support for an extractivist model that knowingly reinforces human and ecological harm.[13]

I trace the cultural roots of this model to the very foundation of Argentina as a nation in the nineteenth century, when the liberal elite of the time initiated a "civilizing," nation-building project that led to dominant myths of national identity. Those myths established Argentina as a modern, European nation and as the "granary of the world" at the turn of the twentieth century, that belle époque when Argentina held close the same promise of development as did other settler states like Canada and Australia.[14] When we follow the structural and historic threads of these core values and beliefs about national identity, we can see the long-lasting impact on Argentines' perceptions of nature, rural life, agricultural production, and the nation's role in the global economy.

Seeds of Power makes visible the complex web of power hidden behind the promising discourse of technological innovation for development. Powerful actors operating from the male-dominated spheres of the state and corporations down to local agribusinesses, the farm, and the household

use various strategies to create consent, including economic redistribution and references to myths of national identity and scientific expertise. The "subjects of power"—the regular people who run the everyday operations in the rural communities of the Pampas; those who live, work, and play on and near the soy farms—tend to highlight the benefits of GM soybeans. Like Leo, many who neither control nor profit from farming feel included in that "we" who can boast about having "the best agriculture in the world." In a way this makes sense, considering that in recent years soybean exports have brought affluence to the rural sector, a huge relief after decades of crisis. But it is a puzzling situation at the very least, considering that more and more people are getting sick while soybeans grow in their backyards. Despite the known environmental and health risks of pesticide drift, rural inhabitants in the Pampas region often disregard potential harm, minimize toxicity, and emphasize the cutting-edge qualities of biotechnology and the economic rewards of soybean production. I argue that they consent because they reap economic and cultural benefits and because they do not "see" harm, due to the strategic construction of a no-risk discourse around agrochemical spraying.

Environmental justice (EJ) theory and methodology highlight unequal power dynamics in society that result in an unequal distribution of the costs and benefits of production practices. Thanks to a vast EJ scholarship, we know, with near-mathematical certainty, that people at the end of the power spectrum, the communities of poor people and people of color, bear a disproportionate burden of the costs, while those who reap the benefits live upstream and upwind, mostly untouched by the environmental harm they create with their decisions.[15] We know, too, of the motivation that drives those with decision-making power: a general mandate to increase profitability and to pursue economic growth.[16] But we know much less about the strategies corporate and state actors mobilize to legitimate injustice—that is, how they create compliance in unjust situations.[17] How multiple dimensions of inequality (class, gender, race/ethnicity, rural/urban divides, a history of colonialism) intersect to exacerbate environmental injustice is also vastly undertheorized.[18]

This book delves into an understudied aspect of environmental justice studies to look at the actors who are often absent in the analysis of EJ's uneven-burden equation: those who are "in between" the distribution of power and their role in creating and reinforcing environmental injustice. Those who wield power are the CEOs of the agribusinesses, the soybean

producers, and the state officials; these individuals control and profit from agricultural production and are able to mobilize science, media, and the rule of law to their advantage. At the "bottom" are the poor and powerless, those who due to their class, gender, and/or race occupy the lower rungs of society: indigenous peasants and working-class women. Those "in between" fall along the race/class/gender spectrum. They are the rural folks of the Pampas who are of European descent and who indirectly reap some of the benefits of soybean production: they are the employees of agribusinesses, landowners who rent their land for others to farm, the wives of soybean producers, and other professionals and business owners who benefit from rural economic development but are not in the "farming business." What those who are "in between" have in common is that while they do not have control over the farm, they reap some benefits from soybean production (mostly in terms of rent or income), but, because they live near toxic facilities (the farms, in this case), they also bear the health and environmental costs of extractivism. As I show, they are, perhaps without knowing or wanting to be, strategic in reproducing the status quo. This book illustrates the complex, ambiguous situation those rural inhabitants of the Pampas occupy, while it also reveals the strategies that more powerful actors engage in to quell dissent when the poor and powerless do eventually mobilize against injustice.

This book may not end with the message of hope that other books on the struggles for environmental justice deliver. Yet understanding how powerful actors create acquiescence over the unequal distribution of the social and ecological costs of extractivism and why ordinary people re-create an unjust system is essential to a fuller understanding of the forces that create—but may also potentially challenge—environmental injustice in Argentina and around the world.

What Are Genetically Modified Crops?

Genetically modified crops are the result of a plant-breeding method known as recombinant DNA.[19] With the aid of a gene gun, scientists insert a gene from another living being, bacterium, or virus into the DNA of plant cells to express a desired trait. Proponents of the technology have made bold claims over its potential to engineer crops that express world-saving traits, like enhanced nutritional value. Vitamin A–enhanced Golden Rice is one of the classic examples of how GM biotechnology could save the

hungry and the poor. Yet, despite billions of dollars invested over decades, Golden Rice has still not been released commercially for cultivation. Plus, critics argue, it would be a woefully inadequate answer for addressing social and environmental problems in the Philippines, the country where the technology is targeted.[20] The range of available GM crops is actually quite narrow. The two most common transgenic traits, herbicide tolerance and insect resistance, are modified into four major commercial crops: soybeans, corn, cotton, and canola. These four products account for 99 percent of all transgenic crops planted globally. Soybeans alone make up 50 percent of that number.[21]

Transgenic soybeans have been modified to resist glyphosate-based herbicides—a technological development branded by Monsanto as Roundup Ready (abbreviated as RR) because the soybeans can tolerate spraying with Roundup, the company's best-selling weed killer. A new variety of transgenic soybean seeds "stacks" both herbicide-tolerant and insect-resistant traits (a technology developed and sold by Monsanto as Intacta Roundup Ready 2 Pro, first released in Brazil in 2010 and in Argentina in 2012). Insect-resistant crops (primarily corn and cotton, sold under the brand Intacta) have been modified to express Bt toxins, a pesticide, so that when insects feed on the crop, they die through poisoning.[22] This technological development reduces farmers' need to spray chemical insecticides to control insect pests (corn borers, rootworms, and bollworms, in particular). Herbicide-resistant seeds work in a different manner. In conventional farming, farmers till the soil before sowing to remove weeds. Soil tilling, however, breaks the soil structure, which causes nutrients and moisture to wash away; this was a major problem across the Pampas before the adoption of GM crops. Now, because RR soy plants are resistant to the chemical herbicide, farmers can sow without tilling and spray the weed killer later. This "technological package," the combination of the no-till farming method, RR soybean seeds, and glyphosate-based herbicide, thus came to solve important sustainability problems for producers in the Pampas. It also, most substantially, simplified production practices, lowered the costs of labor and input, and increased profitability (as I will detail in chapter 2). Throughout my fieldwork, producers and agronomists often sang the praises of the revolutionary qualities of "the technological package of RR soy."

The GM industry presents transgenic crops as a boon for farmers and the environment, as these crops would reduce applications of agrochemicals and

enable farmers to transition to less toxic ones. In particular, glyphosate-based Roundup is advertised and sold as safe for humans and the environment.[23] Glyphosate is classified as having a low toxicity by the US Environmental Protection Agency and by its counterpart in Argentina, the Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA). In the Pampas, before the introduction of RR soy, farmers were spraying more toxic and more expensive agrochemicals. Glyphosate substituted for those, thus simplifying farming practices; reducing per-hectare herbicide spraying, labor, and fossil-fuel expenditures; and minimizing environmental impact.[24] Over the years, however, farmers have encountered problems with resistance as weeds and insects have adapted to transgenic terrains. As early as 2002, farmers in Argentina and the United States began reporting the emergence of glyphosate-resistant "superweeds" in fields planted with herbicide-resistant soy and corn. In the summer of 2013, Brazilian farmers suffered a major pest outbreak of bollworms, causing them billions of dollars in losses from soybean and cotton harvests supposedly controlled by insect-resistant Intacta seeds. Such events force farmers to spray more and more agrochemicals to control pests.[25]

Glyphosate use in Argentina, the United States, and Brazil has risen sharply since the adoption of RR seeds.[26] Its toxicity has been under close scrutiny increasingly since 2015, when the International Agency for Research on Cancer of the World Health Organization reclassified the herbicide as "probably carcinogenic to humans."[27] Farmers have also fallen back into applying complementary herbicides of higher toxicity, like paraquat, 2,4-D, and atrazine.[28] Farmers resort to increasing agrochemical use and to adopting newer varieties of GM crops to maintain high productivity.[29] Thus, while the industry proposes GM crops as a sustainable technological solution, in practice the logic of capitalism pushes farmers into adopting the newly available technologies to sustain accumulation even if they increase social and ecological risk.

GM crops were first grown commercially on a significant scale in 1996. The United States and Argentina, alongside Canada, China, and Mexico, were pioneers in adopting the new GM biotechnology. Twenty short years later, GM crop acreage has expanded over a hundredfold—an astonishing fact that leads some to argue that GM crops are the fastest-adopted agricultural technology in human history since the invention of the plow ten thousand years ago.[30] In 2017, GM crops covered 190 million hectares mostly across three countries: the United States, Brazil, and Argentina. (For reference, this amount of land represents a fifth of the total land area

of the United States and five times that of Germany.) These three countries alone account for 78 percent of global GM crop production. The top seven largest growers (including Canada, India, Paraguay, and Pakistan) plant 95 percent of the global GM crops.[31]

As these numbers suggest, while transgenic crops have spread fast, they have done so unevenly. GM crops have met with mixed reactions across the globe.[32] Farmers in the United States, Canada, and Argentina have embraced them, and they are increasingly predominant in South American agricultural lands (as they expanded from Argentina into Brazil, Paraguay, and Bolivia). But they face widespread resistance across the European Union, in particular in France, the United Kingdom, and Germany. GM crops have expanded over a fraction of the agricultural area of India and Pakistan but are almost nonexistent across the rest of Asia.[33] There is no commercial cultivation of GM crops in Japan or in most of Africa, though currently a second generation of GM crops (engineered using CRISPR technologies) is being forcefully promoted by philanthropic organizations like the Gates Foundation, particularly in Burkina Faso and Uganda.[34]

GM crops are framed as a technology that is "pro-poor" and environmentally sustainable.[35] The promise of GM crops is that they would allow poor smallholder farmers from developing countries to grow more food using fewer resources. According to the United Nations, 821 million people were hungry in 2017: that is one in every nine people in the world. Global food insecurity is exacerbated by civil conflict and the environmental challenges that threaten food production, such as droughts, flooding, and hurricanes.[36] Increasing food productivity via GM biotech adoption is proposed as a solution to address global hunger, poverty, and environmental degradation. It is a "daunting task," reads the first paragraph of the International Service for the Acquisition of Agri-biotech Applications' (ISAAA's) annual report, the pro-biotech think tank, "feeding the world which is continuously increasing and predicted to be 9.8 billion in 2050 and 11.2 billion in 2100."[37]

"How the world will feed itself," writes economist and sustainability advocate Jeffrey Sachs, "is one of the most complicated unsolved problems of sustainable development."[38] The humanitarian goal of "feeding the world" and the technological optimism that sustains the promising discourse of GM crops are not reserved for the industry and its think tanks but are also disseminated by public intellectuals like Sachs, Thomas Friedman, and Steven Pinker.[39] This type of discourse has taken a hold in Argentina. The root of the problem of global hunger, the narrative goes, lies in a combination

of population growth and insufficient technologies, a problem that worsens with climate change. Thomas Malthus first warned us about the seriousness of this problem, writes Sachs. In 1798, Malthus theorized that population growth tends to overrun food supply.[40] Starting with the Green Revolution in the 1940s, the Malthusian narrative has buttressed arguments for the promotion and proliferation of agrarian technological innovation in the Global South, of which GM crops are its latest iteration, as I will detail in chapter 1.

Cutting-edge agrarian technologies like GM crops are the proposed tools for sustainable development. The goal of sustainable development, according to Sachs, is to achieve economic growth that is socially inclusive and environmentally sustainable.[41] Authors like Sachs, Friedman, and Pinker have revitalized modernization theory in the era of climate change. Their ideas matter because they influence development theory and policy at the global level, as exemplified by the United Nations 2030 Agenda for Sustainable Development. As I show throughout the book, their ideas have also been adopted by political and agribusiness leaders in Argentina.

In this paradigm, technological innovation is key to achieving the goal of sustainable development. In the tradition of modernization theory, these authors celebrate industrialization and mechanization as enabling economic growth through the harnessing of natural resources, particularly coal. But while the burning of fossil fuels on a massive scale gave humanity "modern civilization," Sachs argues, it has "such dire side effects, that it endangers civilization itself."[42] We *are* close to reaching the tipping point that would make this planet uninhabitable.[43] How then to further economic growth while minimizing ecological impact? According to these authors, and to ecological modernization theorists in general, the solution lies in the *knowledge* to innovate and to transition to "green" technologies. GMO promoters also emphasize this point: knowledge is key to farming and therefore to feeding the world. As I show in chapter 2, this narrative builds on the promise of ecological modernization to delink the logic of capitalism from its toxic, industrial material practices.[44] This narrative also relies on a traditional definition of development that quantitatively equates economic growth with social well-being and that qualitatively defines development as a linear evolution toward progress, civilization, and Western modernity via constant industrialization and mechanization.[45] These ideas and beliefs are deeply rooted in Argentina's national origins and have been appropriated and mobilized by political

and economic elites to create consent over GM soy extractivism as a development tool for the country.

Why Do Soybeans Matter?

Soybeans are the most ubiquitous crop most people never think about. In 2017, they covered 125 million hectares across the world, growing mostly in the United States, Argentina, and Brazil.[46] (For reference, that is twice the size of Texas, the largest of the continental US states.) A soy plant grows as high as three feet tall in a bright green leafy bush, and each of its furry pods holds three precious light-brown beans (figures I.1 and I.2).

If you question whether you have ever eaten genetically modified soybeans, the answer is likely yes. Ninety-four percent of all soybeans planted in the United States are from herbicide-resistant seed varieties. In Argentina, that figure escalates to almost 100 percent.[47] While soybeans are used to make the usual tofu, tempeh, and soy milk, most of the soy we eat is unrecognizable as such. GM soybeans enter the food system in processed foods and animal-derived products. Soybean oil is the edible oil most widely used by the food industry. It is in crackers, chocolate, cereal bars, margarine, mayonnaise, salad dressings, dairy and meat substitutes, and more. Non–cow milk infant formula is also soy based.[48] However, while about 15 percent of US soybeans go toward the production of foods for human consumption, the primary market for soybeans is animal feed. More than 70 percent of US soybeans is used to feed poultry, hogs, cattle, and even fish.[49] The rest is used for industrial purposes, from personal care products (like cosmetics and skin and hair conditioning) to biodiesel and construction material.

Soybeans are a profitable business. In 2016, soybeans and their derivatives (soybean meal and oil) accounted for $86 billion in global exports. The United States, Argentina, and Brazil are the top global soybean exporters. Together these three countries hold 82 percent of the export market for soy and its derivatives. (Argentina is the largest exporter of soybean oil and soybean meal in the world.) China is the top buyer of global soybeans. Asian countries (with India at the top, followed by Bangladesh, China, and South Korea) import almost half of all global soybean oil exports. Almost 40 percent of global soybean meal exports is destined for animal feedlots across the European Union.[50]

The promise of GM crops to alleviate world hunger and to address climate change falls apart with the fact that most soybeans are not grown for

Fig. I.1. Rows of young GM soybean plants in the central Pampas region. Photo by the author.

Fig. I.2. Soybean seeds ready to be planted. Photo by the author.

human consumption. The high demand for soybeans in Asia is a response to the emerging middle class; as people grow more affluent, they tend to consume more meat. This rapid demand for animal protein, however, puts substantial pressure on the environment.[51] Meat production is resource intensive and thus not an efficient or sustainable way to feed more people. As Richard York and Marcia Hill Gossard note, "Up to 10 times the quantity of resources (land, energy, and water) is needed to produce meat relative to equivalent amounts of vegetarian food."[52] Intensive animal farming is also a major source of methane emissions, a greenhouse gas contributing to global warming.[53] As Gustavo Oliveira and Susanna Hecht argue, the expansion of soy to address Asian demand needs to give way to "a more truthful stance" about soybeans—that they are being produced less to address humanitarian concerns based on a Malthusian narrative than for their high profitability in the international market.[54]

The global soybean chain is controlled by a handful of transnational corporations that reap most of the benefits of the global soy trade. Three giant multinational agribusinesses (ChemChina-Syngenta, Corteva Agriscience, and Bayer-Monsanto) control more than 60 percent of the global commercial seed market and 70 percent of the agrochemical industry. Four grain-trading companies (ADM, Bunge, Cargill, and Louis Dreyfus—collectively known as the ABCDs) control 90 percent of the export market.[55] The agrifood sector is increasingly more concentrated as a result of recent mergers and acquisitions. In 2017, ChemChina acquired Syngenta, and Dow and DuPont became Corteva Agriscience. In 2018, Bayer merged with Monsanto. Altogether, the combined assets of these three giant agribusinesses amount to $352 billion, and their combined total annual revenue is $190 billion. The ABCDs are dominant exporters in South America as they have acquired local companies and invested in soybean storage, processing, logistics, and trade.[56] Financial capital is also pervasive in the global food system as financial actors and institutions (banks, hedge funds, and mutual funds) can trade—and increasingly speculate on—soybeans as commodities in the global financial market and also purchase and lease farmland for agricultural production.[57] The soybean chain in Argentina reflects the global trend of increased concentration and integration.[58]

In two short decades Argentina has positioned itself in the global food system as a strategic provider of soybeans for the livestock complex.[59] As I will explain in chapter 1, this came about as the result of a process of neoliberal agrarian restructuring that took place in the 1990s and accelerated

drastically with the introduction of herbicide-tolerant seeds in 1996. This agrarian transformation resulted in a soy boom. Between 1996 and 2015 production has expanded yearly. By 2015, about 21 million hectares were sown with GM soybeans, over half of all Argentine land under cultivation.[60] Every year, farmers hit a new record harvest. A record-breaking sixty million tons of soybeans were harvested in 2015, 96 percent of which was destined for the export market. The share of soybeans in Argentina's total exports is highly significant. Between 1996 and 2015, soybean exports accounted for between a quarter and a third of total exports.[61] In addition to soybeans, Argentina is a large exporter of corn, wheat, and other crops. In fact, cereals, vegetable oils, and other agricultural and animal products and byproducts made up more than 60 percent of all Argentine exports for 2015.

The soybean chain is consolidated across just a handful of large agribusinesses that guide agrarian production from afar, distanced from the social and environmental realities where soybeans are grown. Large private companies have the power to guide technological development as they provide much of the funding for research and development.[62] Thanks to their adoption of the technological package of GM soy, farmers can grow a highly uniform and standard product, essential for meeting the needs of what Philip McMichael calls the "corporate food regime." Soybeans are a preferred "flex crop" because they can be sourced indistinctively from Argentine, Brazilian, or Paraguayan farms and given multiple and flexible uses by being processed into food, fuel, animal feed, or building material.[63] This is convenient and profitable for the national and transnational corporate actors that control agricultural production and guide technological innovation. Political elites benefit too because they manage to contain political conflict by accelerating economic growth.[64] Corporate and state actors are allies in the promotion of GM biotechnology as they reap the political and economic benefits of increasing economic growth.[65]

But what happens on the ground? So far, the literature on the political economy of soybeans has studied sky-high macro processes, thus missing the human dimension of the issue. The narrative on GM crops promoted by the industry and by modernization scholars also tends to high levels of abstraction by disembedding agricultural production from its social and ecological contexts, as they present GM crops as a one-size-fits-all solution for sustainable development. What we need are studies on GM biotechnology that go beyond broad generalizations about the benefits of GM crops

to an abstract "poor" population in order to focus on the specific contexts in which specific crops are adopted.[66] Building from macro-level work by political economists of development and the environment, including my own, here I dive into the meso- and micro-levels of soybean production in Argentina, zooming in on the rural communities of the Pampas, Argentina's historic agro-export sector. I thus embed GM soybeans in context, tying allegedly immaterial knowledge-based agriculture to the material bodies, resources, and practices that make resource extractivism possible. In doing so, I trace the workings of power across the spectrum of social life, from the large-scale institutions of politics and the economy to everyday face-to-face interactions. I thus show how genetically modified soybeans matter not only as a profitable agro-industrial crop but as a site to study power dynamics that create and legitimate environmental injustice.

Synergies of Power

Various forces have played a role in making Argentina acquiescent in the face of a massive agrarian transformation based on the expansion of genetically modified soybeans. I propose "synergies of power" as a conceptual shortcut to refer to the intersecting structural and symbolic dimensions of domination that operate simultaneously and across time to create, compound, and legitimate environmental injustice.[67]

Much effort in environmental justice scholarship has been devoted to studying one or two dimensions of social inequality; most often, the focus has been on how race and class inequalities relate to exposure to environmental hazards.[68] But this strict focus misses the broad picture. Social inequalities in lived experience (of race, ethnicity, gender, or class) are not based on strictly separate categories, but as David Pellow argues, they are "mutually reinforcing in that they tend to act together to produce and maintain systems of individual and collective power, privilege, and subordination."[69] Traditional EJ studies also focus almost exclusively on the United States, so their conclusions about the place of race in socioenvironmental relations are often not applicable to Latin American countries, which have different systems of racial hierarchies and classification.[70] Moreover, by focusing mostly on the collective struggles for environmental justice, they miss the much larger picture: acquiescence is often the norm.[71] I address these limitations by studying how multiple historical forms of power and inequality intersect to exacerbate environmental injustice. I do this by considering

racial and gendered hierarchies that result from settler colonialism, by focusing on the absence of mobilization, and by analyzing the efforts of political and economic elites to quell dissent.

Power underlies the social and environmental dynamics that create environmental injustice.[72] Yet most EJ scholarship often does not engage directly with the question of how power operates.[73] Rather, in the study of environmental injustice, the workings of power are assumed. As I have already noted, it is a trope in this literature to argue that powerful actors live upwind and upstream from the toxic facilities they command and benefit from, while communities of poor and people of color bear the burden of the toxic impact of the extraction and production processes and must ultimately mobilize for redress.[74] This scholarship often documents the distribution of environmental damage.[75] But the strategies, mechanisms, and dimensions of power that create and sustain these unequal dynamics are rarely explored. By bringing the study of power front and center to EJ scholarship, I want to emphasize the "often neglected, yet fundamental, legitimation and discursive processes" that underpin injustice.[76] Because, as Steven Lukes argues, the "most invasive and insidious form of power" is exercised when subjects come to comply with their situation of domination and thus remain acquiescent in the face of injustice.[77]

The Roots of Power

The book begins by tracing the historical and cultural roots of the political economy of soybean extractivism in Argentina. It is important to establish that dependence on agricultural exports for foreign income is not a recent development for Argentina, and neither is large-scale capitalist agrarian production in the Pampas. As early as the 1940s, Latin American structuralists and dependency theorists, such as Raúl Prebisch, Osvaldo Sunkel, Fernando H. Cardoso, and Enzo Faletto, were writing about the intrinsic disadvantages of the region's dependency on commodity exports.[78] Following Karl Marx, they took a historical approach to studying Latin America's political economy. The origins of extractivism, they argued, should be traced back to the colonial period. I also take a historical approach to studying structural formations and, thus, power and injustice. I attend to the temporal dimensions of inequality because power and privilege compound over time, while I also consider the cultural dimensions of inequality. Since Max Weber's and Antonio Gramsci's critiques of Marx, sociologists have paid attention to how history and culture are threaded into the social structure.[79]

By considering how culture interweaves with history structurally and in terms of interaction, I show how culture serves to shape and legitimate the political economy of extractivism—and thus promotes acquiescence and consent.

Chapter 1, then, is a cultural history of soybean extractivism, from the beginning of the nation to the present. I trace how agro-industrial production for export has been at the core of Argentina's development project since its independence from Spain in the early nineteenth century. I show how members of the intellectual elite of the time, known as the Generation of 1837, used their economic, political, military, and discursive power to shape Argentina's social structure and, most importantly, to legitimate it. In charge of building the nation, the Generation of 1837 crafted a model for Argentina on the ideals of European Enlightenment, modernization, and comparative advantage. With essays and novels, these intellectuals crafted the future of the nation. Domingo Sarmiento's *Facundo* established a foundational dichotomy of "civilization or barbarism" that set the tone of the nation-building project and was to become a guiding myth of Argentine national identity, in which savage nature must be tamed to make it productive.[80]

The use of violence, inflicted upon indigenous peoples and ecologies through military operations and the introduction of industrial agrarian technologies, was another main mechanism of social control. Thus, I also show how nineteenth-century elites put forward a plan to dispossess indigenous peoples from their territory and to populate it with European migrants. The conquest of the so-called desert implied the killing and displacement of indigenous populations.[81] This nation-building project shaped Argentina's agrarian structure.

During the late nineteenth and early twentieth centuries, European migrants settled in the Pampas and established a type of capitalist agriculture based on large-scale production for export. These migrants are known as *chacareros*, *gringos*, and *colonos*—closer to American farmers than to Latin American *campesinos* (peasants). By the turn of the twentieth century, with their novel farming arrangements and technologies, chacareros had turned the Pampas into the motor of Argentina's economy through agricultural exports like wheat and beef. This is the origin of a second guiding myth of national identity, that of Argentina as the "granary of the world."[82] As I show in chapters 1 and 2, by the turn of the twenty-first century, political and economic elites had mobilized the promising discourse of GM crops to

feed the world sustainably, a discourse that taps into ecological modernization but moreover finds its cultural roots in these guiding myths of national identity.

An important way in which power operates to shape and contain conflict is through the mobilization of bias.[83] Those in power draw from discourses that center on shared cultural values to enact and legitimate power and inequality. As Marisol de la Cadena argues, this form of power is also exercised through the exclusion of certain actors and issues from the political arena altogether.[84] The nation-building project of the liberal elite of the nineteenth century created a racialized political economy built on an assimilationist ideology. It created a dominant myth of a "white" Argentina of European descent, where there are no races or racism. This, in turn, rendered indigenous peoples invisible and marginalized.[85] A less studied consequence of this ideology, one that I want to bring attention to, is that it also created a gendered political economy.

The newly arrived European migrants in the Pampas organized labor across traditional European gender lines, with men (husbands, fathers, and adult sons) responsible for the commercial farming and women charged with managing the home. Gender roles at the production level of GM soy have intensified historical patterns of gender inequity and inequality in the region; to this day, men of European descent still control large-scale soybean production.[86] In the political economy of soybean extractivism, racialized subjects (indigenous peoples, smallholder peasants) and feminized subjects (women who identify primarily as mothers and caregivers) are lower in the social hierarchy and thus excluded from decision-making power over large-scale farming.

Selling Revolution in the Pampas

Another important piece of the puzzle that explains acquiescence is economic redistribution. There is acquiescence and consent because in the short and medium term, some of the profits of GM soybean production trickle down through rural towns. The material abundance brought by the soy boom into the larger towns of the Pampas stands in stark contrast with the long period of crisis that preceded it. "We all live off the countryside" was a common refrain I heard from residents of the Pampas. Economic dependence, the literature shows, stifles mobilization.[87] When people are economically dependent on a single industry, they are less likely to protest against it. That is the case for rural soy towns in Argentina too.

But that is not the whole story. The workings of power are not always observable.[88] As I mentioned above, along with the distribution of material resources, powerful actors mobilize cultural values and beliefs to shape grievance framing and to secure consent. In Argentina, corporate and state actors have used their discursive power to present GM biotechnology as a positive and necessary development, a key strategy to create hegemonic consensus over soybean extractivism as a key accumulation strategy.[89] The media, in particular, is one of the most effective and widely used strategies to foster acquiescence and consent.[90] In chapter 2, I show how powerful corporate and state actors mobilize a pro–GM soy discourse that strategically and very effectively links the ecological modernization/sustainable development discourse of GM crops "feeding the world" to the guiding myths of Argentine national identity. Because this framing of GM biotech resonates with deeply held beliefs of national identity, rural inhabitants of the Pampas are, using Rachel Schurman and William Munro's words, "culturally predisposed" to perceive the biotechnology in a positive light and without much questioning.[91] That is because it is the familiar way in which they perceive the world. Therefore, the economic dependence and cultural identity created around agrarian technological innovation in larger rural towns have created consent around the benefits of the agro-industry.

Less spoken of are the costs of the soy boom: abandoned towns, rapid deforestation, violent land grabs, peasant displacement, corporate concentration of farmland, loss of food security, and the accumulating environmental and health hazards of agrochemical spraying. A well-established body of literature on the political economy of the environment situates the origin of social and environmental problems in the logic of capitalism.[92] The treadmill of production theory counters the ecological modernization theory espoused by promoters of GM biotechnology. As treadmill scholars Allan Schnaiberg and Kenneth Gould argue, powerful social actors (in this case, political and economic elites) promote technological innovation to speed up production and natural resource extraction.[93] This eventually leads to decreased social benefits, as machines replace workers, and to increased ecological harm due to pollution and depletion of natural resources.

Thus, in chapter 2, I juxtapose the positive framing of GM soy production—the economic growth, modernity-bringing discourse—with the social and environmental debt that results from GM soy expansion. From the perspective of traditional EJ studies, we would expect rural communities in the

Pampas, faced with mounting socioecological degradation, to organize in opposition. But this is not the case. I argue that another piece of the puzzle of acquiescence—alongside economic dependence and cultural identity—is that rural inhabitants do not "see" the negative consequences that could be framed as a grievance worth mobilizing for. On the contrary, when soybean producers and rural neighbors look out over the farms surrounding their homes, they do not perceive the potential toxicity and harmful health risks of agrochemical exposure. Instead, wearing their "modernizing" glasses (as the guiding myths that make up their worldview), they see productivity and technological advantage (a "civilized" nature) as well as "nature" itself (green and quiet as opposed to the polluted, busy life of the city).

The literature in social movements is clear: Why mobilize if there is not a grievance worth mobilizing for? While potential grievances are ubiquitous, not all injustices lead to collective action.[94] Framing theorists argue that the way people interpret their grievances is critical to participation.[95] *Frames* capture the cultural and emotional dimensions of movements, and they serve both as "persuasive devices" to capture adherents as well as "interpretive frameworks."[96] A problem often needs to be visible for "consciousness transformation" to occur, so that people may interpret/frame the problem as a grievance that requires remediation.[97] In her study of acquiescence in Appalachia, Shannon Bell shows how the worst aspects of coal mining are out of sight and thus "out of mind." Similarly, Kari Norgaard argues that a reason for inaction vis-à-vis climate change is because the worst consequences of a warming planet are yet to be fully visible and experienced.[98]

However, as these and other authors argue, the visibility/awareness of environmental hazards is not an objective experience; it is socially constructed.[99] Powerful actors can influence perceptions, cognitions, and preferences in situations of latent conflict. The health and environmental impacts of agrochemical exposure, in particular, are often not even directly visible; they require medical and environmental scientists to determine and translate risk.[100] The negative consequences of pesticide drift unfold slowly over time, as agrochemicals accumulate in soil, water, air, and bodies over years and years of relentless toxic spraying. Chronic exposure to environmental hazards is a "silent" problem, as Thomas Beamish argues, and an invisible one, as I argue, which obscures the visibility necessary for the transformation of consciousness required for collective action.[101]

As corporate and state authorities, aided by their expert advocates, minimize risk to legitimate production technologies, they create acquiescence among laypeople, who trust the experts to keep them safe. Rural folks who make a living out of soybean production, in particular agribusinesses' employees and landowners who rent out their land, are caught "in between," and they help perpetuate injustice by invoking scientific expertise and cultural myths of national identity to support soybean production.

The Elephant in the Field

Power is most effective when subjects accept the order of things (the status quo) and willingly comply with their position of subordination. In such times, grievances may remain latent. A very necessary, though difficult, analysis of power requires that we broaden its scope to include latent grievances and the potential for conflict to fully understand how subjects accept and reproduce their structurally disempowered position.[102] How to recognize latent grievances, which are clear cases of not-observable nonevents, poses an important challenge to researchers. In my case, however, latent grievances were hiding in plain sight. They were "the elephant in the room."[103] The real and potential health risks of agrochemical exposure are a gigantic presence in the rural communities of the Pampas, though most residents I encountered were actively pretending not to notice.

In chapter 3, I delve deeper into the households in rural Pampas communities, to the level of interactions and emotions, to show how grievances are kept latent among the public. I tell the stories of a group of women from a soy town I call Santa María to show that latent grievances exist and, therefore, to underscore how successful the mechanisms of power have been in creating acquiescence. These women are mothers who benefit from soybean production, mostly through their husbands in the agribusiness. In public, all the women celebrated soybean production and reiterated "we all live off the countryside." Yet in private, in murmurs and whispers, they shared with me their worries and fears over toxic agrochemical spraying in their surroundings. In their community, these women notice rising cancer rates among their neighbors, miscarriages among healthy women, and malformations in newborns. In contrast to the shared narrative I will describe in chapter 2 (all benefits, no costs), these mothers "see"—they perceive—the negative impact of soybean extractivism. But while they share latent grievances, they do not act on them. While individually they worry, in public, they silence and deny. This leads us to interrogate

the factors that *impede* individual resistance from transforming into collective action.[104]

In chapter 3, I show how the women of Santa María socially construct denial through doubt, silence, and policing themselves and others.[105] I also show how perceptions of environmental harm have an emotional, gendered component. Feminized subjects responsible for children prioritize care and precaution—a way of knowing that is opposed to what is presented by the (male and masculinized) producers and experts who emphasize no risk and prioritize profits and growth. But while these women's gendered selves allow them to "see," their structurally disempowered social positions force them into silence. Following Vincent Roscigno, I highlight the dynamic and relational features of power.[106] As noted, there are hierarchies within rural folks. While these wives and mothers enjoy the wealth and privilege granted by their husbands' position, they themselves hold no control over farming. Caught "in between," they trade power for patronage and actively create their acquiescence.

Against the Grain

Conflict makes power explicit. Overt conflict reveals the actual existence of grievances, as a contradiction between the interests of power elites and their subjects and their (the subjects') willful resistance to domination.[107] In chapter 4, I shine a light on those who bear the brunt of the costs of the GM soy model and who have organized to protest against the resulting environmental injustice. They are women-led citizen assemblies in defense of health and life, triggered by the spread of agrochemically induced illnesses in the Pampas region. They are also peasant-indigenous peoples defending life and livelihood against the forced evictions and habitat devastation that result from the northern expansion of the agrarian frontier. These movements are doing very important, timely work, but they have not gained the traction one might expect given the urgency of their demands.

To scale up, activists face structural barriers that result from two centuries of agro-exporting: their own economic need (activists are poor or from working-class backgrounds); their gender (movements are led by women who identify as mothers who are concerned over the impact of agrochemical drift on children's health); their ethnicity/race (peasant-indigenous); and the economic well-being/dependence of the farms that surround them and of the country as a whole. They also face deeply ingrained cultural barriers erected by the guiding myths of Argentine national identity. Their

mobilizing frames, which directly oppose large-scale agrarian production, do not resonate with mainstream values and beliefs. As Schurman and Munro argue, culture shapes opportunities for anti-biotech activism.[108] But here I show how the "cultural economy" also *constrains and suffocates* activism by creating acquiescence in the general population. Critical to this, I argue, are the overt and covert strategies power elites deploy to stall, silence, and demobilize activists and their demands. I thus reveal how corporate and state actors, aided by their expert advocates, use their structural and symbolic power to diminish the power of social movements that might otherwise move Argentina's development trajectory away from extractivism.

In the Fields and in the Kitchens

Seeds of Power is a case study of Argentina's agrarian transformation based on the early adoption and intensive implementation of herbicide-resistant genetically modified soybeans. Case studies allow us to capture the complex, rich texture of social life by focusing on the detailed study of a single case.[109] This is key to studying the explicit and hidden manifestations of power.[110]

I define my case in terms of the type of agricultural system: my unit of analysis is the agricultural export sector.[111] For Argentina, this refers mostly to the Pampas region (see map I.1). The Pampas extend across the provinces of Buenos Aires, Entre Ríos, Santa Fe, Córdoba, and La Pampa. The region is characterized by its vast plains of fertile land, temperate climate, and adequate rainfall, making it ideally suited for large-scale grain production and cattle ranching. As I show in the following chapters, the rural population in the Pampas is characteristically of European descent, and the population density in rural areas is very low. Historically, the Pampas have been the core of Argentina's agro-export model, reliant on capitalist agriculture, and where farmers first adopted the technological package of GM soy. Eighty-seven percent of the country's herbicide-resistant soybeans is grown in this region.[112] Since the early 2000s, the agrarian frontier has expanded past the Pampas into the northern Chaco region, over the provinces of Chaco, Formosa, Salta, and Santiago del Estero. The northern Chaco forest is the largest forest ecosystem and the largest biomass reservoir in Argentina and extra-tropical South America.[113] The Chaco region relies on forestry and cotton production. In terms of population, it hosts a mix of people of

Map I.1. Map of Argentina, showing the Pampas region and the area of soybean production. Created by the author with data from Argentina's Secretary of Agroindustry. Map drawn by Bill Nelson.

European descent and the majority of indigenous peoples who live in Argentina. The region has historically been poor and marginalized.

I take a multilevel, multimethod approach to capture the synergies of power. I used a variety of qualitative methods, including interviews, participant observation, and content analysis, to gather data on the micro- and meso-levels of interactions, culture, and community. I relied on quantitative data from online databases to grasp the macro-level of the political economy and the meso-level of farms and rural towns. I relied on statistical information on economic and social development from the Observatory of Economic Complexity, the Economic Commission for Latin America and the Caribbean, and the Argentine government, particularly the Ministry of Agriculture, Livestock, and Fisheries (Secretary of Agroindustry since 2016) and the INDEC.

My fieldwork took place mostly in the Pampas region during four different visits from 2009 to 2015, though I made one visit to the Chaco region in July and August of 2011 (to the provinces of Chaco and Santiago del Estero, in particular). In the Pampas, I visited small and larger rural towns in the center, northwest, and southeast of Buenos Aires province and the center and south of Córdoba province in December 2009 to January 2010, June and August 2011, January to April 2012, and August 2015. I conducted forty-five formal interviews with soybean producers; agribusiness employees, investors, and consultants; rural inhabitants; indigenous-peasant and anti-fumigation activists; and Argentine academic experts. I use pseudonyms for interviewees and places of residence when I tell their stories, except when I refer to public figures.

While this is a case study of agrarian transformation, not all my interviews took place in rural areas. I interviewed activists and academics in the cities of Córdoba, Buenos Aires, Bahía Blanca, Rosario, and Santiago del Estero. I interviewed agribusiness leaders, investors, and employees in these cities and even in a summer resort on the coast of Buenos Aires province (during the summer of 2012). Soybean production, as I show, can be managed from afar, and that is a key to acquiescence. While there are soybean producers and employees living in rural towns, the technological package allows a highly qualified labor force to manage very large areas of farmland from a distance—aided by technologies like computers, cell phones, and satellites. Many people with decision-making power over agrarian production do not live in rural areas (and, thus, they do not have to bear a critical cost of soybean production: exposure to agrochemical spraying). I interviewed

soybean producers, investors, and employees in the least likely of places to be considered part of the rural sector, from the wealthy Recoleta neighborhood in downtown Buenos Aires to the beach.

Most of my formal interviews were with men. That was not because I purposely decided to do so, but because I decided I would study Argentina's agrarian transformation based on the adoption of GM biotechnology. The agribusiness model is male-dominated; men of European descent are mostly in charge of organizing and performing production. I realized later that I took this fact so much for granted that I did not see it as special, as something that needed to be problematized. It took me a long time to realize I was spending most of my "downtime" during fieldwork in rural towns with women, but by the time the formal interviews would start or when I was to visit the farms, the women would leave me "to do my work" and men would lead me into "what I have to know."

However, in one town in particular, which I call Santa María, my main informant, Nidia, was close to my own family, and she took me in, I felt, like her own daughter. Thanks to this, I gained insider status among a tight-knit group of women/mothers quite quickly. We cooked together, washed dishes, and sipped *mates* while watching over children who refused to take their siesta in the hot summer of February 2012. I believe I gained the confidence of these women thanks to Nidia, of course, but also because they saw me as their equal: a cisgender woman of childbearing age who, like them, is a middle-class woman of European descent born and raised in the Pampas. They assumed that marriage (undoubtedly heterosexual) and raising children were in my near future. Thus, I believe that in their minds I shared their potential worries over children's health. The unspoken subtext was always, "You understand because you are a woman and thus a future mother." As I write in chapter 3, these interactions puzzled me. I am not a mother, and I do not believe that women have, by nature, a mother's sixth sense. As a sociologist, I explain the so-called mother's intuition to care about children's health (the women activists I write about in chapter 4 also emphasized that) as a gendered way of knowing that is a result of gendered structures (as I detail in chapter 3). Yet these interactions were so powerful that they gave me new insight.

While in the field, across rural towns in the Pampas, people like Leo told me repeatedly, "We do the best agriculture in the world" and "We all live off the countryside." Who am I, as an outsider, to doubt my interviewees? To claim that they live in an unjust situation, that there are potential

or latent grievances that should lead to mobilization? It was this group of women who, in close connection among equals, shared their worries and fears with me and exposed the contradiction between what people were saying and what they were worrying about. That is, they exposed the latent grievances I was looking for—latent grievances that I was able to notice later as being unspoken in other conversations, even with the men. For a moment, they unveiled the elephant for me. In this book, I explain why they have to veil it again and again, why they keep silent in the face of the health hazards of agrochemical exposure. My hope is that this book voices what for them, in the Pampas, remains unspeakable.

NOTES

Introduction

1. Leguizamón, "Modifying Argentina"; Newell, "Bio-Hegemony."

2. "Sólo la biotecnología salvará al mundo," *Clarín*, January 29, 2001.

3. See Aranda, *Tierra arrasada*; Cáceres, "Accumulation by Dispossession"; Lapegna, *Soybeans and Power*; Leguizamón, "Modifying Argentina"; Pengue, "Transgenic Crops in Argentina."

4. Magdoff and Tokar, *Agriculture and Food in Crisis*; R. Motta, "Social Disputes over GMOs"; Stone, "Anthropology of Genetically Modified Crops."

5. R. Motta, *Social Mobilization*; Schurman and Munro, *Fighting for the Future of Food*; Scoones, "Mobilizing against GM Crops in India, South Africa and Brazil"; Patel, *Stuffed and Starved*.

6. Fitting, *Struggle for Maize*; Kinchy, *Seeds, Science, and Struggle*.

7. On India, see Patel, *Stuffed and Starved*. On France, see Heller, *Food, Farms, and Solidarity*.

8. On European Union regulations, see Qaim, "GM Crop Regulation"; and National Academies of Sciences, Engineering, and Medicine (NAS), *Genetically Engineered Crops*. Reports of bans are from the European Commission; see "Several European Countries Move to Rule Out GMOs," accessed April 16, 2019, http://ec.europa.eu/environment/europeangreencapital/countriesruleoutgmos.

9. Harrison, *Pesticide Drift*; Alkon, "Food Justice and the Challenge to Neoliberalism."

10. Lapegna, *Soybeans and Power*; Leguizamón, "Environmental Injustice in Argentina"; R. Motta, *Social Mobilization*; Newell, "Bio-Hegemony."

11. Coronil, *Magical State*.

12. By "perspectives on the political economy of the environment," I mean sociological work that focuses on the power dynamics over the control of material resources that sustain life. See Rudel, Roberts, and Carmin, "Political Economy of the Environment."

13. I am certainly not the first sociologist to ask why communities remain acquiescent in the face of social and environmental injustice. See, for example, the important work of Auyero and Swistun, *Flammable*; Beamish, *Silent Spill*; Bell, *Fighting*

King Coal; Crenson, *Un-Politics of Air Pollution*; Cable, Shriver, and Mix, "Risk Society and Contested Illness"; Gaventa, *Power and Powerlessness*; Lapegna, *Soybeans and Power*; Lukes, *Power*; Norgaard, *Living in Denial*; Roscigno, "Power, Revisited"; and Shriver, Adams, and Messer, "Power, Quiescence, and Pollution." Yet the number of studies on acquiescence is quite limited, and "attention to inaction remains the exception rather than the core of what most [sociological] analyses do" (Roscigno, "Power, Revisited," 354).

14. Pigna, *Los mitos de la historia argentina*, vol. 2; Shumway, *Invention of Argentina*.

15. See, among others, Bullard, *Dumping in Dixie*; Cole and Foster, *From the Ground Up*; Mohai, Pellow, and Roberts, "Environmental Justice."

16. Foster, Clark, and York, *Ecological Rift*; Gould, Pellow, and Schnaiberg, *Treadmill of Production*; Rudel, Roberts, and Carmin, "Political Economy of the Environment"; Schnaiberg and Gould, *Environment and Society*.

17. Auyero and Swistun, *Flammable*; Bell, *Fighting King Coal*; Gaventa, *Power and Powerlessness*; Lukes, *Power*; Shriver, Adams, and Messer, "Power, Quiescence, and Pollution."

18. Gould, Pellow, and Schnaiberg, *Treadmill of Production*; Pellow and Brulle, *Power, Justice, and the Environment*; Pellow, *What Is Critical Environmental Justice?*

19. I use the terms *genetically modified*, *genetically engineered*, and *transgenic* interchangeably to refer to plants that result from gene splicing recombinant DNA (in particular, to herbicide-tolerant and insect-resistant GM crops: soybeans, corn, cotton, and canola). While supporters of the technology argue that conventional plant breeding and modern genetic modification are equivalent as they both result in a plant with altered genomes, critics argue that these are *qualitatively different* processes. In traditional plant and animal breeding, breeders can only mix species that are sexually compatible. GM biotechnology is different from the traditional process because transgenic mixing cannot be realized in natural settings and is possible only in the lab. Kloppenburg, *First the Seed*.

20. On the potential of Golden Rice, see the Golden Rice Project website, accessed October 27, 2018, http://www.goldenrice.org. The crop had not been approved as of October 2018; see International Service for the Acquisition of Agri-Biotech Applications (ISAAA), GM Approval Database, accessed October 27, 2018, http://www.isaaa.org/gmapprovaldatabase/event/default.asp?EventID=528. For a critique, see Stone and Glover, "Disembedding Grain."

21. In addition to soybeans, corn accounts for 31 percent of global crops planted; cotton, 13 percent; and canola, 5 percent. The remaining 1 percent of commercially planted GM crops is made up of alfalfa, sugar beets, papayas, potatoes, eggplants, and apples. ISAAA, *Global Status of Commercialized Biotech/GM Crops in 2017*, 91.

22. For more on *Bacillus thuringiensis* crops, see "What Is Insect Resistance in Crops?," UC Davis Seed Biotechnology Center website, accessed November 11, 2018, http://sbc.ucdavis.edu/files/191415.pdf.

23. Glover, "Corporate Shaping of GM Crops"; Gillam, *Whitewash*.

24. Qaim and Traxler, "Roundup Ready Soybeans in Argentina"; Trigo, "Fifteen Years of Genetically Modified Crops in Argentine Agriculture."

25. On "superweeds," see Gilbert, "Case Studies"; Livingston et al., *Economics of Glyphosate Resistance Management in Corn and Soybean Production*. On bollworms in Brazil, see Oliveira and Hecht, "Sacred Groves," 256; Pinto, Mattos, Silva, Rocha, and Elliot, "Spread of *Helicoverpa armigera*." On the increasing use of agrochemicals, see Binimelis, Pengue, and Monterroso, "'Transgenic Treadmill.'"

26. Benbrook, "Trends in Glyphosate Herbicide Use"; Catacora-Vargas et al., "Soybean Production in the Southern Cone of the Americas." In Argentina, the rate of glyphosate use per hectare has more than doubled since the adoption of herbicide-tolerant soybeans, from 2.05 kilograms per hectare in 1996 to 4.45 kilograms per hectare in 2014. Benbrook, "Trends in Glyphosate Herbicide Use," appendix.

27. International Agency for Research on Cancer, *Evaluation of Five Organophosphate Insecticides and Herbicides*.

28. Paraquat is a highly toxic poison with associated risks of neurologic disease. 2,4-D was a main component in the infamous Agent Orange used by the United States during the Vietnam War, and research shows an association of non-Hodgkin lymphoma with high exposure to 2,4-D. Atrazine is a potent endocrine disruptor. Centers for Disease Control and Prevention, "Facts about Paraquat," April 2, 2013, https://emergency.cdc.gov/agent/paraquat/basics/facts.asp. Kim, Kabir, and Jahan, "Exposure to Pesticides"; Smith et al., "2,4-Dichlorophenoxyacetic Acid (2,4-D) and Risk of Non-Hodgkin Lymphoma"; Hayes et al., "Atrazine Induces Complete Feminization and Chemical Castration in Male African Clawed Frogs (*Xenopus laevis*)."

29. Binimelis, Pengue, and Monterroso, "'Transgenic Treadmill'"; Leguizamón, "Modifying Argentina."

30. Jacobsen et al., "Feeding the World," 652.

31. In 1996, the United States, Argentina, Canada, China, and Mexico together planted 1.7 million hectares of GM crops, the vast majority across the United States and Argentina. In 2017, the United States planted 75 million hectares of GM crops (40 percent of the global total); Brazil, 50.2 million hectares (26 percent); Argentina, 23.6 million hectares (12 percent); Canada, 13.1 million hectares (7 percent); India, 11.4 million hectares (6 percent); and Paraguay and Pakistan, 3 million hectares each (2 percent each). ISAAA, *Global Status of Commercialized Biotech/GM Crops*.

32. Glover, "Corporate Shaping of GM Crops"; R. Motta, "Social Disputes over GMOs"; Schnurr, "Can Genetically Modified Crops Help the Poor?"; Schurman and Munro, *Fighting for the Future of Food*; Oliveira and Hecht, "Sacred Groves."

33. In India, GM crops cover 6 percent of total agricultural area; in Pakistan, they cover 8 percent. Calculated from data listed in ISAAA, *Global Status of Commercialized Biotech/GM Crops*; and Food and Agriculture Organization of the United Nations (FAO), "Country Profiles, Estimates for 2014," accessed October 23, 2018, http://www.fao.org/countryprofiles.

34. On Japan, see the US Department of Agriculture Foreign Agricultural Service (USDA FAS), "Japan. Agricultural Biotechnology Annual: Japan's Regulatory System for GE Crops Continues to Improve," Global Agricultural Information Network (GAIN) Report JA5024 (Washington, DC: USDA), July 13, 2015, https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Agricultural%20Biotechnology%20

Annual_Tokyo_Japan_7-13-2015.pdf. On second-generation GM crops in Africa, see Schnurr, "Can Genetically Modified Crops Help the Poor?"; Dowd-Uribe, "GMOs and Poverty"; Schurman, "Micro (Soft) Managing a 'Green Revolution' for Africa."

35. Dowd-Uribe, "GMOs and Poverty"; Glover, "Corporate Shaping of GM Crops"; Schnurr, "Can Genetically Modified Crops Help the Poor?"

36. United Nations, Sustainable Development Goals, "Zero Hunger: Why It Matters" (New York: United Nations, 2016), accessed October 23, 2018, https://www.un.org/sustainabledevelopment/wp-content/uploads/2018/09/Goal-2.pdf; FAO, *Crop Prospects and Food Situation*, Global Quarterly Report 3, September 2018, http://www.fao.org/documents/card/en/c/CA1487EN.

37. ISAAA, *Global Status of Commercialized Biotech/GM Crops*, 1.

38. Sachs, *Age of Sustainable Development*, 317.

39. Friedman, *Hot, Flat, and Crowded*; Pinker, *Enlightenment Now*.

40. Sachs, *Age of Sustainable Development*, 317. Malthus's famous thesis, as developed in *An Essay on the Principle of Population*, is that population growth increases geometrically while food production increases arithmetically, thus leading to chronic food shortages.

41. Sachs, *Age of Sustainable Development*.

42. Sachs, *Age of Sustainable Development*, 10.

43. Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014*; IPCC, *Global Warming of 1.5°C* (Geneva: IPCC, 2018), https://www.ipcc.ch/sr15/.

44. Buttel, "Ecological Modernization as Social Theory"; Givens, Clark, and Jorgenson, "Strengthening the Ties"; Pinker, *Enlightenment Now*.

45. Gudynas, "Debates on Development"; Peet and Hartwick, *Theories of Development*.

46. USDA FAS, "World Agricultural Production," accessed August 26, 2018, https://apps.fas.usda.gov/psdonline/circulars/production.pdf.

47. For the United States, see Jim Barrett, "USDA Reports Soybean, Corn Acreage Down," news release (Washington, DC: National Agricultural Statistics Service, United States Department of Agriculture), June 29, 2018, https://www.nass.usda.gov/Newsroom/2018/06-29-2018.php. For Argentina, see Trigo, "Fifteen Years of Genetically Modified Crops."

48. US United Soybean Board, "Soybean Oil for the Food Industry," accessed October 24, 2018, https://www.soyconnection.com/foodindustry. Soybean-based milk formula is used for infants who are believed to be lactose intolerant. "Soy Infant Formula," National Institute of Environmental Health Sciences website, December 28, 2018, https://www.niehs.nih.gov/health/topics/agents/sya-soy-formula/index.cfm.

49. USDA, "USDA Coexistence Fact Sheets: Soybeans," February 2015, https://www.usda.gov/sites/default/files/documents/coexistence-soybeans-factsheet.pdf.

50. The $86 billion in global soy exports breaks down as follows: $51.7 billion in beans, $9.45 billion in soybean oil, and $24.8 billion in soybean meal. Soybean meal is a byproduct of the extraction of soybean oil and is used as a protein source to feed

cattle, poultry, and hogs. In 2016, Argentina was the top global exporter of soybean meal (40 percent of global exports, export value of USD $9.95 billion) and the top exporter of soybean oil (44 percent of global exports, valued at USD $4.14 billion). China imported 62 percent of global soybeans in 2016, and India, 27 percent of global soybean oil; 39 percent of soybean meal is destined for countries in the European Union. Observatory of Economic Complexity (OEC), "Products," accessed November 15, 2018, https://atlas.media.mit.edu/.

51. Patel, *Stuffed and Starved*; Rosa et al., "Human (Anthropogenic) Driving Forces."

52. York and Gossard, "Cross-National Meat and Fish Consumption," 294.

53. Jorgenson, "Global Warming and the Neglected Greenhouse Gas."

54. Oliveira and Hecht, "Sacred Groves," 252.

55. Pat Mooney and the ETC Group, "Blocking the Chain: Industrial Food Chain Concentration, Big Data Platforms and Food Sovereignty Solutions" (Val David, QC: ETC Group, GLOCON, INKOTA-netzwerk, and Rosa Luxemburg Stiftung, 2018), http://www.etcgroup.org/sites/www.etcgroup.org/files/files/blockingthechain_english_web.pdf; Elsadig Elsheikh and Hossein Ayazi, *The Era of Corporate Consolidation and the End of Competition: Bayer-Monsanto, Dow-DuPont, and ChemChina-Syngenta*, research brief (Berkeley: Haas Institute for a Fair and Inclusive Society at the University of California, Berkeley), October 2018, https://haasinstitute.berkeley.edu/sites/default/files/haas_institute_shahidi-_era_of_corporate_consolidation_end_of_competition_publish.pdf.

56. IPES Food, "Too Big to Feed: Exploring the Impacts of Mega-Mergers, Consolidation and Concentration of Power in the Agri-Food Sector" (Brussels: IPES Food, 2017), http://www.ipes-food.org/_img/upload/files/Concentration_FullReport.pdf; Oliveira and Hecht, "Sacred Groves," 257.

57. Clapp, "Financialization, Distance and Global Food Politics"; Fairbairn, "'Like Gold with Yield'"; Isakson, "Food and Finance."

58. Leguizamón, "Disappearing Nature?"; Turzi, *Political Economy of Agricultural Booms*.

59. McMichael, *Food Regimes*; Teubal, "Genetically Engineered Soybeans."

60. Data on soybean production are from the Argentine Ministry of Agriculture, Livestock, and Fisheries (MAGYP). Secretaría de Agroindustria, "Datos abiertos de agroindustria," accessed October 4, 2016, http://www.siia.gov.ar/index.php/series-por-tema/agricultura.

61. Argentine exports are calculated from data listed in OEC, "Products."

62. Leguizamón, "Disappearing Nature?"; Oliveira and Hecht, "Sacred Groves." On research and development funding, see Schnaiberg, *Environment*.

63. McMichael, "Food Regime Genealogy"; McMichael, *Food Regimes*. On flex crops, see Borras et al., "Land Grabbing"; Oliveira and Hecht, "Sacred Groves," 256.

64. Schnaiberg, *Environment*; Gould, Pellow, and Schnaiberg, *Treadmill of Production*.

65. Otero, "Neoliberal Food Regime."

66. Dowd-Uribe, "GMOs and Poverty"; Glover, "Corporate Shaping of GM Crops"; Leguizamón, "Modifying Argentina"; Leguizamón, "Disappearing Nature?"; Schnurr, "Can Genetically Modified Crops Help the Poor?"

67. I develop the concept of "synergies of power" from reading Gould, Pellow, and Schnaiberg (*Treadmill of Production*, 59), who invite scholars to think about how power operates synergistically to reinforce power and powerlessness.

68. For a critical review of classic EJ literature, see Pellow, *What Is Critical Environmental Justice?*; Pellow and Nyseth Brehm, "Environmental Sociology for the Twenty-First Century"; and Pellow and Brulle, *Power, Justice, and the Environment*, chap. 1.

69. Pellow, *What Is Critical Environmental Justice?*, 19. See also Pellow and Brulle, *Power, Justice, and the Environment*.

70. Sundberg, "Tracing Race."

71. For exceptions to the focus on collective action, see Auyero and Swistun, *Flammable*; Beamish, *Silent Spill*; Bell, *Fighting King Coal*; Lapegna, *Soybeans and Power*; Norgaard, *Living in Denial*; and Shriver, Adams, and Messer, "Power, Quiescence, and Pollution."

72. Gould, Pellow, and Schnaiberg, *Treadmill of Production*; Mohai, Pellow, and Roberts, "Environmental Justice"; Rudel, Roberts, and Carmin, "Political Economy of the Environment"; Pellow and Nyseth Brehm, "Environmental Sociology for the Twenty-First Century."

73. Shriver, Adams, and Messer, "Power, Quiescence, and Pollution."

74. Bullard, *Dumping in Dixie*; Cole and Foster, *From the Ground Up*; Mohai, Pellow, and Roberts, "Environmental Justice."

75. Pellow and Nyseth Brehm, "Environmental Sociology for the Twenty-First Century." A relatively small but important body of work expands this limited focus on environmental disadvantage toward exploring environmental privilege. See, for example, Mascarenhas, *Where the Waters Divide*; Norgaard, *Living in Denial*; Park and Pellow, *Slums of Aspen*; Pulido, "Rethinking Environmental Racism"; D. Taylor, *Environment and the People in American Cities*.

76. Roscigno, "Power, Revisited," 350.

77. Lukes, *Power*, 28.

78. Bértola and Ocampo, *Economic Development of Latin America since Independence*; Cardoso and Faletto, *Dependency and Development in Latin America*; Kay, *Latin American Theories*.

79. Weber, *Protestant Ethic*; Gramsci, *Selections from the Prison Notebooks*.

80. Sorensen, *"Facundo" and the Construction*; Shumway, *Invention of Argentina*.

81. Gordillo and Hirsch, "Indigenous Struggles"; Halperin Donghi, *Nación para el desierto*.

82. Shumway, *Invention of Argentina*; Pigna, *Mitos de la historia argentina*.

83. "Mobilization of bias" refers to the set of predominant values, beliefs, and institutional procedures that operate systematically to the benefit of political and economic elites. See Bachrach and Baratz, "Two Faces of Power"; Gaventa, *Power and Powerlessness*; Lukes, *Power*.

84. de la Cadena, "Indigenous Cosmopolitics in the Andes."

85. Alberto and Elena, "Introduction." On indigenous marginalization, see Gordillo and Hirsch, "Indigenous Struggles"; Lapegna, *Soybeans and Power*.

86. Stølen, "Agricultural Change in Argentina"; Stølen, *La decencia de la desigualdad*; Ferro, *Género y propiedad rural*.

87. See Auyero and Swistun, *Flammable*; Beamish, *Silent Spill*; Bell, *Fighting King Coal*; Crenson, *Un-Politics of Air Pollution*; Gaventa, *Power and Powerlessness*; Gould, "Pollution and Perception"; Gould, "Sweet Smell of Money."

88. Bachrach and Baratz, "Two Faces of Power"; Gaventa, *Power and Powerlessness*; Lukes, *Power*.

89. Newell, "Bio-Hegemony"; Gras and Hernández, "Hegemony, Technological Innovation, and Corporate Identities."

90. Herman and Chomsky, *Manufacturing Consent*; Lukes, *Power*; McChesney, *Rich Media*.

91. Schurman and Munro, *Fighting for the Future of Food*, xvi–xvii.

92. Foster, "Marx's Theory of Metabolic Rift"; Foster, Clark, and York, *Ecological Rift*; O'Connor, *Natural Causes*; Pellow and Nyseth Brehm, "Environmental Sociology for the Twenty-First Century"; Rudel, Roberts, and Carmin, "Political Economy of the Environment."

93. Schnaiberg, *Environment*; Schnaiberg and Gould, *Environment and Society*; Gould, Pellow, and Schnaiberg, *Treadmill of Production*.

94. McAdam, *Political Process*; McCarthy and Zald, "Resource Mobilization and Social Movements."

95. Goodwin, Jasper, and Polletta, "Emotional Dimensions of Social Movements"; Jasper, "Emotions and Social Movements"; Benford and Snow, "Framing Processes and Social Movements."

96. Polletta and Ho, "Frames and Their Consequences," 190.

97. Bell, *Fighting King Coal*, 3–4; McAdam, *Political Process*.

98. Bell, *Fighting King Coal*; Norgaard, *Living in Denial*.

99. Auyero and Swinstun, *Flammable*; Beamish, *Silent Spill*; Bell, *Fighting King Coal*; Norgaard, *Living in Denial*; Gould, "Pollution and Perception"; Gould, "Sweet Smell of Money"; Stauber and Rampton, *Toxic Sludge Is Good for You!*.

100. Brown, "Popular Epidemiology"; Cable, Shriver, and Mix, "Risk Society and Contested Illness"; Harrison, *Pesticide Drift*; Kinchy, *Seeds, Science, and Struggle*.

101. Beamish, *Silent Spill*.

102. Gaventa, *Power and Powerlessness*; Lukes, *Power*.

103. Zerubavel, *Elephant in the Room*.

104. Shriver, Adams, and Messer, "Power, Quiescence, and Pollution."

105. These are common strategies identified in the sociology of denial literature; see, for example, Auyero and Swistun, *Flammable*; Norgaard, *Living in Denial*; and Zerubavel, *Elephant in the Room*.

106. Roscigno, "Power, Revisited."

107. Gaventa, *Power and Powerlessness*; Lukes, *Power*.

108. Schurman and Munro, "Targeting Capital."

109. Walton, "Making the Theoretical Case," 124.

110. Gaventa, *Power and Powerlessness*; Lukes, *Power*; Roscigno, "Power, Revisited."

111. Paige, *Agrarian Revolution*.

112. Data are for 2016. Secretaría de Agroindustria, "Datos abiertos agroindustria."

113. Pengue, "Transgenic Crops in Argentina"; Gasparri, Grau, and Manghi, "Carbon Pools."