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Amalia Leguizamon

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ROUNDPUP READY NATION:
THE POLITICAL ECOLOGY OF
GENETICALLY MODIFIED SOY IN ARGENTINA

by

AMALIA LEGUIZAMÓN

A dissertation submitted to the Graduate Faculty in Sociology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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This manuscript has been read and accepted for the Graduate Faculty in Sociology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK
Abstract

ROUNDUP READY NATION:
THE POLITICAL ECOLOGY OF GENETICALLY MODIFIED SOY IN ARGENTINA

by

Amalia Leguizamón

Adviser: Professor Kenneth A. Gould

This dissertation is a case study of agrarian transformation in an agro-export society, Argentina. I study the process of adoption of the technological package of genetically modified (GM) soy in the Argentine countryside, its socio-ecological consequences, and Argentines’ responses to it. In particular, this research addresses Argentina’s unique situation of being a developing country that has positively embraced the biotechnology of GM seeds as a key accumulation strategy without the emergence of major contestation against GM soy monocropping. In order to answer the puzzle of quiescence, I look at how power relations structure access to social and environmental goods and bads, as well as at how power relates to the causes of consensus and conflict. From a critical political economy perspective, in this work I contribute to three major areas of substantive research: (1) Technology and socio-environmental change; (2) Natural resource extraction as a model of neoliberal socioeconomic development for Latin America; and (3) Social movements, in particular rural and environmental movements in the Latin American region. It terms of data collection, I rely on a multi-method approach based on archival research, quantitative analysis, and ethnographic methods (interviewing and participant observation).
Whether GM crops can alleviate poverty and address food security while conserving ecosystems remains one of the most divisive questions in contemporary development studies. This dissertation is thus a necessary and timely contribution to debates on agricultural GM biotechnology. More broadly, the aim of this research is to contribute to discussions around the dynamics of agrarian and rural transformations, technological adoption and resistance, and the relationship between ecological modification and social change.
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With love and gratitude, I dedicate this dissertation to my parents.
## TABLE OF CONTENTS

List of Figures and Tables ............................................................................................................ x  
List of Abbreviations .................................................................................................................. xi

### CHAPTER 1. INTRODUCTION ................................................................................................. 1  
A Massive Agrarian Transformation .......................................................................................... 3  
1.1 RESEARCH DESIGN ............................................................................................................ 5  
Research Questions ..................................................................................................................... 5  
Methodology ................................................................................................................................ 6  
1.2 HOW THIS DISSERTATION IS STRUCTURED ................................................................. 9

### CHAPTER 2. THEORETICAL FRAMEWORK .......................................................................... 10  
2.1 TECHNOLOGY AND SOCIO-ENVIRONMENTAL CHANGE .............................................. 10  
Agriculture as a Technique, Agrarian Revolutions ................................................................. 15  
GM Biotechnology, Third Agricultural Revolution ................................................................. 16  
2.2 THE AGRO-INDUSTRY & THE GLOBALIZATION PROJECT .......................................... 20  
Non-Traditional Agro-Export Production in Latin America ...................................................... 23  
2.3 MAIN ARGUMENTS FOR AND AGAINST GMOS ............................................................ 27  
Arguments in Favor of GM Biotechnology ............................................................................... 28  
Arguments Against GM Biotechnology ................................................................................... 29  
A Short Discussion on These Two Perspectives ..................................................................... 32  
2.4 SOCIAL MOVEMENTS, QUIESCENCE, POWER ............................................................ 33  
Resistance and Mobilization Against GMOs .......................................................................... 34  
Social Movement Theory and Quiescence:  
Why Do Movements Emerge, Why Do They Fail to Emerge? ................................................ 38  
Quiescence and Power:  
The Missing Link in Social Movement and Collective Action Theory ................................. 43  
One Last Note on Quiescence ................................................................................................. 49

### CHAPTER 3. GM SOY IN ARGENTINA .................................................................................. 50  
3.1 ADOPTION AND EXPANSION OF GM SOY IN ARGENTINA ......................................... 51  
3.2 CONTEXT OF GM SOY ADOPTION IN ARGENTINA ...................................................... 55  
Current Context: The Kirchners’ Administrations ................................................................... 58  
3.3 SOCIO-ENVIRONMENTAL IMPACT OF GM SOY PRODUCTION .................................. 67
CHAPTER 4. QUIESCENCE ................................................................................................. 79
4.1 POWER & (BIO)HEGEMONY .................................................................................... 81
Mechanisms and Strategies of Power: A Recipe for Swift Adoption .............................. 83
4.2 BENEFITS OF THE TECHNOLOGY #1: PROFITS ................................................... 96
Growing Greens: Nature as a Source for Profit ............................................................. 97
Todos Vivimos del Campo: We All Live Off the Countryside ....................................... 102
4.3 BENEFITS OF THE TECHNOLOGY #2: PROGRESS/MODERNITY ......................... 106
Cultural Preparation. Argentineanness = Modernness .................................................... 107
The Root of It All: Conceiving Argentine Identity, Becoming Modern ......................... 108
4.4 MAIN GRIEVANCE: A CONFLICT OVER PROFITS ............................................... 117

CHAPTER 5. CONTESTATION .......................................................................................... 127
5.1 POWERLESSNESS ..................................................................................................... 128
5.2 COSTS & GRIEVANCES OF THE TECHNOLOGY #1: THE NEOLIBERAL MODEL .... 131
La Lucha por la Tierra: The Struggle over Land ............................................................. 133
5.3 COSTS & GRIEVANCES OF THE TECHNOLOGY #2: GLYPHOSATE .................. 134
The Mothers of Barrio Ituzaingó Anexo, Córdoba ....................................................... 141
Paren de Fumigar, Stop Spraying .................................................................................... 145
La Lucha por la Salud y la Vida: The Struggle over Health and Life ............................... 147
Power-Launched Counter-Offensive ................................................................................ 150

CHAPTER 6. LATENT GRIEVANCES .............................................................................. 158
6.1 LATENT GRIEVANCES IN THE PAMPAS: HEALTH HAZARDS OF GM SOY PRODUCTION ........................................................... 158
The Elephant in the Room: Silence and Denial ............................................................... 160
Whispers & Silences: The Women of General Artigas .................................................... 162

CHAPTER 7. CONCLUSIONS ............................................................................................. 167
7.1 SUMMARY OF MAIN ARGUMENT & FINDINGS ................................................. 167
The Social Basis of Technological Innovation ............................................................... 167
Creating Consensus and Quiescence ............................................................................. 168
Social and Ecological Impact of GM Soy Production .................................................... 170
Unequal Distribution of Social and Environmental Goods and Bads ......................... 171
Technological Trajectories and the Agent of Change ...................................................... 174
7.2 SIGNIFICANCE ......................................................................................................... 175
7.3 FUTURE RESEARCH ................................................................................................. 179

BIBLIOGRAPHY .................................................................................................................. 181
LIST OF FIGURES AND TABLES

FIGURES
1. Map of Argentina, Pampas Ecoregion, and Area of GM Soy Production .............. 52
2. Soy Planted (in Hectares) and Production (in Tons), Annually .......................... 54
3. Evolution of Planted Area with No-Tillage Farming (in Million Hectares) and Types of Herbicides Used (Atrazine and Glyphosate, in Million Liters) .............. 136

TABLES
1. Civilization vs. Barbarism in Sarmiento's Facundo ........................................ 112
2. Anti-GM Soy Movements in Argentina, Major Dimensions of Variation........ 131
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AACREA</td>
<td>Asociación Argentina de Consorcios Regionales de Experimentación Agrícola</td>
</tr>
<tr>
<td>AAPRESID</td>
<td>Asociación Argentina de Productores en Siembra Directa</td>
</tr>
<tr>
<td>ASA</td>
<td>Asociación de Semilleros Argentinos</td>
</tr>
<tr>
<td>Bt</td>
<td>Bacillus thuringiensis (Herbicide resistant GM trait)</td>
</tr>
<tr>
<td>CeProNat</td>
<td>Centro de Protección a la Naturaleza</td>
</tr>
<tr>
<td>CIAFA</td>
<td>Cámara de la Industria Argentina de Fertilizantes y Agroquímicos</td>
</tr>
<tr>
<td>CONICET</td>
<td>Consejo Nacional de Investigaciones Científicas y Técnicas</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency (USA)</td>
</tr>
<tr>
<td>EJ</td>
<td>Environmental Justice</td>
</tr>
<tr>
<td>FAA</td>
<td>Federación Agraria Argentina</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>GM/GMOs</td>
<td>Genetically Modified / Genetically Modified Organisms</td>
</tr>
<tr>
<td>IASCAV</td>
<td>Instituto Argentino de Sanidad y Calidad Vegetal</td>
</tr>
<tr>
<td>IFIs</td>
<td>International Financial Institutions</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>INTA</td>
<td>Instituto Nacional de Tecnología Agropecuaria</td>
</tr>
<tr>
<td>MNCI</td>
<td>Movimiento Nacional Campesino Indígena</td>
</tr>
<tr>
<td>MOCASE</td>
<td>Movimiento Campesino de Santiago del Estero</td>
</tr>
<tr>
<td>NTAEs</td>
<td>Non-Traditional Agro-Export Production</td>
</tr>
<tr>
<td>RR</td>
<td>Roundup Ready™ (Monsanto’s patented glyphosate-resistant GM trait)</td>
</tr>
<tr>
<td>RR2</td>
<td>Intacta™ RR2™ Pro (Monsanto's double stacked RR-Bt soybean)</td>
</tr>
<tr>
<td>SENASA</td>
<td>Servicio Nacional de Sanidad y Calidad Agroalimentaria</td>
</tr>
<tr>
<td>SRA</td>
<td>Sociedad Rural Argentina</td>
</tr>
<tr>
<td>UAC</td>
<td>Unión de Asambleas Ciudadanas</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>VC</td>
<td>Vía Campesina</td>
</tr>
<tr>
<td>WB</td>
<td>The World Bank</td>
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<td>WHO</td>
<td>World Health Organization</td>
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CHAPTER 1. INTRODUCTION

The biotechnology of genetically modified (GM) seeds is one of the latest and most controversial developments in agriculture.Introduced to the world in the late 1990s as ‘miracle’ crops that will feed a growing world population, soon thereafter a heated debate arose questioning this promise (Schurman and Munro 2010; Stone 2010; Tokar 2001). Since then, farmers, activists, students, scientists, and consumers from North and South have been organizing to protest against GM organisms (Magdoff and Tokar 2010; Otero 2008; Schurman and Munro 2010). Extensive GM contestation has emerged all across the world, from France and the UK (Bonny 2003; Doherty and Hayes 2012; Heller 2011; Schurman and Munro 2010), to Australia and New Zealand (Marsden 2008), in India (Scoones 2008; Shiva 2000), and in Mexico and Brazil (Newell 2008; Otero 2008; Scoones 2008).

Argentina is today the third largest grower of GM crops in the world (James 2012). In Argentina, contrary to most of the world, farmers have been early and eager adopters of GM seeds, the government has, through varied means, encouraged the use of the biotechnology, and civil society has remained, until recently, mostly silent. It is striking that despite the real and potential impact of widespread adoption and use of GM crops barely any public discussion has emerged on this issue. Thus, in contrast with the widespread anti-GMO sentiment at the global level, Argentina stands out as an intriguing case. The aim of this dissertation is to address this puzzle.

Starting in 1996, the adoption of GM seeds in Argentina has been coupled with the replacement of traditional crops such as wheat and beef for GM soybeans produced
for the export market, China and India in particular (Leguizamón 2013; Teubal 2008). In
the last 15 years, GM soy production has increased exponentially: Argentina is now the
third largest producer and exporter of soybeans in the world. ¹ One hundred percent of this
soy is genetically modified (Trigo 2011:9).

Genetically modified soy is Roundup Ready™ soy (RR soy), developed by
Monsanto to be resistant to their best-selling glyphosate herbicide Roundup™. In
conventional agriculture farmers have to till the soil to remove weeds before planting.
GM RR soy simplifies the process, as it is now possible to plant first and spray later,
when weeds appear: as the GM RR plant is tolerant to Roundup glyphosate, weeds die,
GM soy won't. As I show in chapters 3 and 4, to Argentine farmers this is a huge bonus:
simplified production means reduced costs and increased profits. Farmers in other parts
of the world, such as in Canada, the United States, and India, aren't so thrilled about it
though, as Monsanto sets oppressive contracts and high prices to seeds (Patel 2008).

People in general, all around the world, raise other important concerns: if glyphosate is
poison to plants, isn't it poison to people too, as we eat those crops? What happens when
glyphosate is released into the environment? Doesn't it pollute the soil, the water, and the
air? And most importantly, people question why a corporation like Monsanto has the
right to own patents to seeds (see Kloppenburg 2005).² Seeds are the origin of life. By

¹ USDA, United States Department of Agriculture. USDA-FAS, Production, Supply and

² These concerns are very well depicted in documentaries such as The World According
to Monsanto by Marie Monique Robin, The Future of Food, and Food Inc.

³ At this time, only six countries gave commercial permission to GM crops, including the

² These concerns are very well depicted in documentaries such as The World According
to Monsanto by Marie Monique Robin, The Future of Food, and Food Inc.
giving Monsanto the right to control seeds, we've given a corporation the right to control life (Shiva 2000; Shiva 2007).

For all these many reasons, and many more that I bring up throughout this dissertation, GM is a widely controversial technology. Yet in Argentina, the biotechnology of GM seeds has been met with little resistance. Most on the contrary, it has been met with open arms. Back in late 1990s, when most countries were not willing to try out this new, untested technology, Argentina became Monsanto's guinea pig in the Global South, and the port of entry to GM crops in South America.

A Massive Agrarian Transformation

In less than two decades, Argentina has experienced a massive agrarian transformation predicated upon the expansion of GM soy: It is the soyification of Argentine agriculture. Nowadays, 18.7 million hectares, that is, over 46 million acres of Argentine soil, are covered with GM soy. That’s far larger than the whole New York state, or half the size of Germany. As I show in chapter 3, since 1996 when GM soy was first available, production has expanded constantly, year after year, harvest after harvest.

While the modelo sojero, the soy model, is celebrated as a boom, this massive agrarian transformation has radically transformed socio-environmental relations. As a show throughout this dissertation, the expansion of extensive industrial agriculture and the monocultures of GM soy have negative social and ecological impacts, creating

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3 At this time, only six countries gave commercial permission to GM crops, including the United States and Canada (James 1997). By now only 28 countries plant GM crops legally in their territories (James 2012).

deforestation, pollution, and depletion of natural resources, violent land grabs and peasant
displacement, land consolidation, corporate concentration, and loss of local control,
health problems due to glyphosate spraying—including cancer, leukemia, and
miscarriages—, as well as hunger, poverty, inequality, and the loss of food security.

Nonetheless, despite the massiveness of this agrarian transformation, there has
been little resistance to it. On the contrary, in the main, Argentina has embraced the
biotechnology of GM seeds and a model of agricultural production of GM soy for export.
Therefore, the interesting question is how could such a massive agricultural transition
happen without major resistance? The purpose of this dissertation is to address this
puzzle. In other words, why is Argentina quiescent in the face of wide-scale agrarian
transformation based on the expansion of GM soy monocropping? This is the main
research question I answer in this work; a question that, until now, only Newell (2009a)
has tried to answer.

The study of quiescence, though, is not a straightforward matter. In contrast to
studying cases of rebellion, here there are no mobilizations to participate in or social
movement’s leaders to interview. Quiescence is, in a way, the absence of an event. The
question is then, how to study that which does not happen? Moreover, what about the
problem of imputing needs and values to the subjects of study? How can I, as a
researcher, assert that resistance against GM soy should emerge in Argentina? How can
an outsider “know better” than those implicated in the process of social change?5 These
are true epistemological and methodological concerns. However, the difficulty of
carrying out this study does not make the task impossible, less does it overrule its

5 Even though as an Argentine I am deeply invested in this process, the question is still
relevant.
significance (see Gaventa 1980). This is an important matter that has local and global implications, as this study shows.

This dissertation is, thus, a case study of agrarian transformation in an agro-export society. It studies the process of adoption and expansion of GM soy in Argentina, as well as its socio-ecological consequences. The original contribution of this research lies in the study of rural responses to GM soy: It is about quiescence, acceptance, and rebellion towards an agro-industrial model of GM soy production for export. In this way, this dissertation adds to necessary research on reactions and responses towards GM biotechnology in the developing world (Stone 2010; Wield, Chataway, and Bolo 2010). In particular, to the less explored topic of reasons for GM biotech take up in developing countries, and on the class differentiation among different GM producers (Wield, Chataway, and Bolo 2010).

1.1 RESEARCH DESIGN

Research Questions

Set in contrast to the anti-GMO panorama in the rest of the world, the lack of controversy surrounding agro-industrial practices and GM seeds in Argentina is striking. As it arises from this puzzle, the main research question this dissertation addresses is: Why is Argentina quiescent in the face of wide-scale agrarian transformation based on the expansion of GM soy monocropping? Because of the intrinsic problems of studying quiescence, data was gathered on adoption and reactions toward GM crops. Thus, this dissertation also addresses the following questions: Why did Argentine farmers decided to switch their agricultural production to GM soy? What is the role of the government in
GM soy adoption and promotion in Argentina? What are the ecological and social consequences of GM crop production? How are these distributed? In other words, who reap the benefits and who bear the burden of this model of agricultural production? Which groups or actors are more active in supporting the *modelo sojero*? And which are denouncing and/or mobilizing against it? Are there any groups or populations that are being negatively affected by this process and yet remain unaware of it?

**Methodology**

This dissertation is a case study of agrarian transformation: It studies the process of adoption of GM soybeans produced for the export market in the Argentine countryside, its socio-ecological consequences, and Argentines responses to it. One strength of case study as a research method is that it allows capturing the “causal texture of social life”, the complexities, processes, and relationships of the issue at stake (Walton 1992:124). A common criticism against case study research is how much can be learned from a single case (referred as the ‘small-N’ problem). However, it has been shown that case studies can be generalizable and thus help with theory-building (Rueschemeyer 2003). Because there is scarcity of research on this topic, I argue that a case study is necessary in order to learn about it thoroughly and from there advance to seek general patterns in similar cases (Goldstone 2003).

While the study of quiescence is the truly original and interesting question this dissertation addresses, trying to test quiescence directly would make this project unfeasible. Thus, the research strategy I adopted was to do a rigorous study of GM soy adoption in order to be able to make conclusions on quiescence afterwards. This study
has been carried out using a comparative historical approach, as it is customary in case study research (see Mahoney and Rueschemeyer 2003). In this manner, chapter 3 traces the historical process to uncover the causal sequence that produced the outcome under study (Goldstone 2003); the unquestioned fast adoption of the biotechnology of GM soy in the Argentine countryside.

While in the main Argentina has moved towards GM soy production, not all have remained quiescent and some groups have emerged to protest against the model. Four cases of rebellion were studied as counterfactuals: (1) Movimiento Campesino de Santiago del Estero (MOCASE), the peasant movement of Santiago del Estero; (2) Mothers of Barrio Ituzaingó Anexo in Córdoba; (3) Campaign Paren de Fumigar, "Stop Fumigating" in Córdoba and Santa Fe; and (3) Environmental assembly in La Leonesa, Chaco. While the claims of these movements are ongoing, as I describe in chapter 5, it is important to emphasize that these cases of rebellion are not equivalent, in size or visibility, to the main event of general quiescence at the national level. As I show throughout this dissertation, these movements and assemblies have very limited success in their demands, and barely ever make it to national media. Their demands are not shared by those that are in control of agricultural production and are mostly unknown to the general public. In this dissertation I explain why this happens.

The case of study is defined in terms of the type of agricultural system. Thus, the unit of analysis in this study is the agricultural export sector (Paige 1975). In Argentina, this refers mostly to the Pampas region, Argentina’s historic core of agro-export production, where over 80% of GM soy production takes place (see Figure 1, Chapter 3). The Pampas region comprises the provinces of Buenos Aires, Entre Ríos, Santa Fe,
Córdoba and La Pampa. As I describe in chapter 3, in the last few years, the frontier of the monocultures of GM soy has expanded north into the provinces of Chaco, Santiago del Estero and Salta. These provinces of the north and northeast (from now on, the *North*) have historically been regional economies, producing a diversity of produce for the domestic market. Only in the last few years, with the expansion of the frontier of GM soy production, they have been included in the “agro-export” sector.

Therefore, while this case study contains only one unit of analysis, the agro-export sector, the sector can actually be subdivided in two: the *Pampas*, the core of the agro-export sector, and the *North*, the frontier of expansion. Quiescence in the Pampas is my main case of study as it is the main event that defines the country’s position towards GM biotechnology: This area produces almost all the GM soy that is source of Argentina’s foreign income. This dissertation is then mostly a “single-case narrative” (Abbot 1992:62-68).

The population under study is limited to the agrarian sector, meaning all those that make a living from the land, either in crop, income, or profit, and who may or may not live in the countryside. Types include: *campesinos* (peasants), rural workers, agricultural producers, rural contractors, investment pools, and agribusinesses. In terms of data collection, I recurred to a triangulation of sources of evidence, as it is tradition in case study research (Yin 2009:114-118). I have thus recurred to a multi-method approach based on (1) archival research; (2) quantitative analysis of micro and macro data from statistical databases; and (3) ethnographic fieldwork, consisting of participant observation and interviews with peasants, rural workers, small, medium and large producers, rural contractors, and members and employees of agribusinesses, as well as with rural
inhabitants who do not profit directly from soy production. I carried out 40 formal interviews between 2009 and 2012, 27 in the Pampas region (in the provinces of Buenos Aires, Córdoba, and Santa Fe) and 13 in the North (in Santiago del Estero and Chaco).

1.2 HOW THIS DISSERTATION IS STRUCTURED

This dissertation is divided in seven chapters. Following this introduction, chapter 2 is a review of the literature that this dissertation draws on and contributes to, including (1) Technology and socio-environmental change; (2) Natural resource extraction as a model of neoliberal socioeconomic development for Latin America; and (3) Social movements, in particular rural and environmental movements in the Latin American region.

Chapter 3 provides the background for analysis. I look at the historical and structural context of adoption and expansion of GM soy in Argentina. Chapter 4 presents the main case of quiescence in the Pampas and it is the core of this dissertation. Chapter 5 introduces the cases of contestation: (1) Anti-GM/neoliberalism movements in the North and (2) Anti-glyphosate spraying, mostly in the Pampas. Chapter 6 is an ethnographic account on latent grievances among women in the Pampas, primarily focused on the health consequences of glyphosate exposure.

Chapter 7 is the Conclusions chapter, where I summarize this dissertation's main findings and arguments, argue for the significance of this research, and suggest avenues for future research.
CHAPTER 2. THEORETICAL FRAMEWORK

In this chapter I review the literature that provides a framework to the main research question I address in this dissertation: *Why is Argentina quiescent in the face of massive agrarian transformation based on the expansion of genetically modified (GM) soy?* In order to do so, in this chapter I address the following topics: (1) Theories in environmental sociology and their analysis of technological innovation and socio-environmental change; (2) Agrarian technologies, in particular the biotechnology of GMOs (methods, traits, use, debates); (3) Agro-industrialization and agro-exporting as the neoliberal development project in Latin America; and (4) Social movements and quiescence (anti-GM movements, theories).

2.1 TECHNOLOGY AND SOCIO-ENVIRONMENTAL CHANGE

Technology is, at its most basic, how me make and do the things we need (Gould 2009). Examples are plows, factories, computers, satellites, and nuclear power plants. "Technology," therefore, are tools, machines, and techniques. It is also, and most importantly, the ways of organizing (and reorganizing) social relations and nature, the source of all the "stuff" we need and work with (Gould 2009). As such, technology is one of the primary ways human beings relate to the natural environment; it is the nexus between society and nature (Gould 2009). Technology, especially as a means for production, also defines the way human beings relate to each other, the social relations within society (Marx and Engels [1845] 1998; Marx [1847] 1992; Marx [1867] 1990). In consequence, changes in technology bring about changes within society and between
society and nature. This dissertation underscores in particular how technological advances have a tendency to produce socio-environmental crises (Gould, Pellow, and Schnaiberg 2008; O'Connor 1998; Schnaiberg 1980; Schnaiberg and Gould 1994).

Within environmental sociology, two streams of theory take divergent paths on their analysis of technological innovation and socio-ecological change: authors within Ecological Modernization theory (Lewis Mumford, Joseph Huber, Arthur Mol and Gert Spaargaren) share a positive outlook of technological innovation and believe it to be a higher stage in human development. By contrast, authors within critical theories such as Ecological Marxism (James O'Connor) and Treadmill of Production (Allan Schnaiberg, Kenneth Gould, David Pellow) argue that the capitalist logic of accumulation strives for constant technological innovation, the key source of socio-ecological disruption.

Ecological modernization (EM) theory has its roots in the modernization paradigm, a theory of human development where progress is understood as a series of stages that societies go through as they adopt liberal Western values (Mumford [1934] 1963; Parsons 1977). Within this paradigm, science and technology have a very special role to play, as they serve the human need to control and modify the natural environment (Mumford [1934] 1963). As such, progressive technological innovation is celebrated as evidence of the human ability to control nature as well as of having reached a higher stage in human development (Mumford [1934] 1963). Ecological modernization is, therefore, a historically higher phase of industrial society, which Mumford ([1934] 1963) conceived as the "eotechnic phase" and Spaargaren and Mol (1992), "superindustrialism."

Hence, EM authors argue that we have entered a new industrial revolution, one of restructuring of production and consumption along ecological lines (Spaargaren and Mol
In this "ecosocial switchover," as Huber termed it (qtd. in Spaargaren and Mol 1992:335), the design, performance, and evaluation of production processes is increasingly based on ecological as well as on economic criteria. The goal is towards the development and diffusion of new technologies that are "more intelligent" than previous ones. These are "cleaner" technologies that benefit the environment as they "disconnect" economic development from resource input, use, and emissions (for example, chip technology) (Spaargaren and Mol 1992:335). Thus, in this paradigm, it is possible to overcome the current ecological crisis "without leaving the path of modernization" or capitalism (Spaargaren and Mol 1992:334), and that would be through further advancement of technology and industrialization. Modern societies thus point towards hyper- or superindustrialization (Spaargaren and Mol 1992:336).

By contrast to EM, Critical or Neo-Marxian theories take a critical stance towards technology: building on Marx, these theories point at the conflict between capitalist production and the environment. Authors like O'Connor (Ecological Marxism) and Schnaiberg and Gould (Treadmill of Production) agree that the logic of profit ingrained in capitalist production accelerates socio-environmental degradation. James O'Connor, one of the leading authors within Ecological Marxism, points at a “second contradiction,” beyond the “first” economic contradiction thoroughly described by Marx. O’Connor argues that under capitalist production both capital and labor feed off the environment at an increasing pace that will eventually undermine the system itself (O'Connor 1998).

In a similar vein, Treadmill of Production theorists argue that the logic of profit ingrained in capitalist production accelerates socio-environmental degradation (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994). As labor is
replaced with machinery, natural resource extraction grows as well as the polluting consequences of industrial activities, while at the same time social benefits are reduced (i.e., reducing secure employment and increasing unemployment and social inequality). For Treadmill of Production theorists, technological innovation becomes a key source of socio-environmental degradation, as it is because of technology that societies can go beyond ecological limits (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994).

Therefore, while EM theorists dismiss questions and criticism to the capitalism mode of production and accumulation as "not relevant" to overcome the ecological problem⁶ (Spaargaren and Mol 1992:336), that is exactly where critical theories place the burden of the ecological crisis. Certainly ecological disorganization is not unique to modern societies and capitalism: the ancient empires of the Mayans, Aztecs, and Chinese, colonialism and the primitive accumulation for the industrialization of Great Britain are main events of environmental degradation in human history (Foster 1994; Schnaiberg and Gould 1994). However, limited technological capacity forced peoples to live within ecological limits. Since the industrial revolution, and in particular since post-World War II, the treadmill of production has rapidly accelerated both locally and globally, thus accelerating the pace and spread of ecological disorganization (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994). Mass production and the development of new technologies (synthetics, chemicals), in a particular political economic system based on the belief in economic growth, has allowed populations to "overcome" these limits, creating the appearance of a limitless world (Foster 1994;

⁶ The justification for this dismissal is based on the belief that producing greener, cleaner technologies can delink capitalism from the negative consequences of industrialization.
Schnaiberg 1980; Schnaiberg and Gould 1994). Limits will eventually hit nonetheless, as pollution and extraction depletes the natural base (Schnaiberg and Gould 1994).

For EM scholars, the solution to ecological crisis lies on a "major transformation, [an] ecological switch of the industrialization process into a direction that takes into account maintaining the sustenance base" (Spaargaren and Mol 1992:334). Thus new technologies can be created that are cleaner, more efficient, "greener". This is the most widespread of beliefs today, Green Capitalism being the panacea that will salvage capitalism. For critics, however, these are only 'technological fixes'. It is possible (and happens often) that new technologies are created that, for example, reduce fossil fuel use or CO2 emissions (the example of hybrid cars). These are, however, only a fix to a broken system. As Schnaiberg and Gould (1994:53) argue, although these new technologies "can bring some environmental gain, they also produce ecosystem losses. For while there may be some reduction of impacts per unit produced, the total volume of production has risen fast enough to offset this effect. [Therefore], the greatest threat of the treadmill may not lie in deficient technologies that pollute, but in the competitive logic of share[holders'] values without limits."

Therefore, it is not technology itself that is problematic, the source of the "conflict" between societies and ecosystems, but the logic under which technological innovation takes place (Schnaiberg and Gould 1994). There is no, as EM scholars (and most people) believe, objective and neutral science that researches and develops technology for the general wellbeing of humankind (Wright 1992). Technological developments have a trajectory, which is defined by the groups and institutions that have the power to do so (Gould 2009). Which technologies are funded for research and
development and which are taken off the research track is decided by a small elite of powerful groups and institutions, in particular, states, universities, and increasingly so, corporations (Gould 2009). It is estimated that 85% of current global investment in agricultural biotechnology comes from the private sector (International Assessment of Agricultural Knowledge, Science and Technology for Development 2009:30). Moreover, even though the release of any new technology has a direct impact on society and the environment, the R&D process has little or no input from civil society (Gould 2009:104). Without democratic input, technological trajectories clearly "reflect the power and economic interests of the social institutions that control the process" (Gould 2009:102). Following this perspective, this dissertation is not strictly a study of the biotechnology of GM seeds, but a study on how specific social actors and institutions control and define purposes for this technology. It is about technology as an exercise of power.

**Agriculture as a Technique, Agrarian Revolutions**

Some technological innovations are incremental and bring about minimal change. At times, however, breakthroughs in technology take place, resulting in revolutionary change. Ten thousand years ago, “agriculture” as a technique became –as the industrial revolution would later on–, the source of one of the most revolutionary changes in human life (Gould 2009: 97). Large-scale food production made possible cities, armies, and the State. This first agricultural revolution also made possible, for the first time in human history, *the control of nature*, to modify the environment to serve human needs on a mass scale (Gould 2009: 98).
A second revolution in the technology of agriculture took place not long ago, and in a shorter period of time. In the mid-19th century (1830-1880), the scientific discovery of soil chemistry created the fertilizer industry. Capitalist agriculture emerged (Foster 1999:373-378). Marx, in his third volume of Capital, was among the first critics of this transformation (Foster 1999).

The third and latest agricultural revolution started in the mid-20th century, with the emergence of the agro-industry in the United States, which implied a more intensive use of energy and agro-chemicals, the replacement of animals by machines, and, later on, the enclosure of animals in feedlots (“factory farms”) (Foster 1999:374). The technological event that marks this revolution and will eventually transform social relations and society-ecosystems relations relates to genetic science and the seed: First, hybrids; then, GM (Kloppenburg 2005).

**GM Biotechnology, Third Agricultural Revolution**

The biotechnology of GM seeds is fairly new, from the last three decades. Scientists, through mechanical and chemical techniques, modify the DNA of a seed (or

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7 A note on terminology: Biotechnology is the process of modifying living beings with the purpose of fulfilling human needs, a process as old as agriculture itself. For example, beer and cheese are the result of biotechnological processes. Breeding of plants and animals is another common technique to improve desired qualities in crops or animals (Kloppenburg 2005:1). The biotechnology of GM seeds, while a type of biotechnology, is one that is qualitatively different from those traditional processes: Those first biotechniques have a limit, the limit of nature. When breeding plants or animals, breeders can only mix those that are sexually compatible. GM seeds are created in labs, and thus, they do not exist as such in nature. The terminology, like many other aspects of this issue, is also widely contested, and it is appropriated by advocates and opponents as it fits their purpose (Stone 2010:382). Genetic modification (GM), genetic engineering (GE) and transgenic are used interchangeably as they refer to the same technique (gene splicing recombinant DNA); yet depending on emphasis (and scholarly tradition, I would add)
animal), introducing a gene from another living being (or bacteria, or virus) in order to create a new GM seed with a specific trait. The two most common traits available in GM crops are herbicide tolerance and insect resistance, the latter known as Bt for the inserted protein-producing gene of the bacterium *Bacillus thuringiensis*. Recently released varieties combine both traits; this is a technology known as "gene stacking." Soybean, corn, and cotton are the most widely planted transgenic crops (James 2012).

*Roundup Ready*™ soy (RR soy) is Monsanto’s GM soybean, engineered to be tolerant of Monsanto’s best-selling glyphosate herbicide, *Roundup*™. Monsanto thus sells the farmer a whole 'technological package,' that includes the seeds and the glyphosate, used with a no-tillage mechanized method. A 'no-tillage' method means that farmers do not have to till the soil to remove weeds before planting the seed, as is necessary in conventional agriculture. Because the GM RR seeds are tolerant or resistant to the herbicide, farmers can plant first and spray later, when weeds appear. Then the weeds will die but the GM RR plants will not. Bt crops, such as corn and cotton, operate in a slightly different manner: the insecticide is inserted in the seed; it is the seed that expresses the Bt toxin. Thus, when the insect feeds from the seed—insect species of the orders *Lepidoptera* and *Coleoptera* in particular (rootworm, bollworms, beetles, butterflies)—, it dies. Thus, the crop is "insect-resistant," and farmers do not have to spray chemical pesticides to control insect populations. Varieties of soy and corn have been developed with these traits combined (with two, three, and four genes stacked). For one or another will be preferred; i.e., many prefer not to use GE as it gives the technology a degree of certainty and predictability that current science is far from achieving (Tokar 2001:15). Transgenic is less used in US-based research (compared to GM) but common in Argentine speech, as in soja transgénica, transgenic soy (whereas soja genéticamente modificada is barely used).
example, Monsanto's corn *YieldGard™ Plus with RR* combines one HT trait (glyphosate tolerance) + two Bt traits (resistance to Coleopteran and Lepidopteran insects) + antibiotic resistance.⁸

GM field trials first started in 1986 featuring mostly corn, tomato, soybean, canola, potato, and cotton, and were conducted mostly in the USA and Canada (James 1997). The People's Republic of China was the first country to commercially release a transgenic crop, a virus-resistant tobacco, in 1992 (James 1997:13). In 1994, Calgene obtained permission to release the first GM food in the US market, a delayed-ripening tomato branded *Flavr Savr™* (James 1997:2). By 1996, transgenic crops, mostly tobacco, cotton, and soybean, were grown commercially in six countries: the United States, China, Canada, Argentina, Australia, and Mexico (James 1997:2). Since then, the area planted with GM crops has grown 100-fold, from 1.7 million hectares in 1996 to 170.3 million ha in 2012 (James 2012). In 2012, transgenic crops were planted commercially in 28 countries (James 2012). The United States, Brazil, Argentina, Canada, and India are, in that order, the largest GM crop growers (James 2012). These five countries account for 89% of the global area of planted GM crops (James 2012). The speed of adoption of transgenic crops is unprecedented, hailed by some as "the most rapid uptake of a new technology in human history" (Schurman and Munro 2010:xii).

GM biotech development is carried by and controlled almost entirely by corporations: BASF, Monsanto, Bayer, Syngenta, DuPont, and Dow, the world's six largest agrochemical and seed companies, own the patent monopoly for 42 of the 55 existing patent families (ETC Group 2008:14). Corporations respond primarily to their

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shareholders; their goal is to increase profitability (Gould 2009). In terms of seed development thus, the definition of a crop's 'desirable traits' is measured in relation to final sales and not to other qualities that could be of general interest, such as nutritious value (Patel 2008). The technological trajectory of GM crop development thus reflects this profit-laden interest: dominant GM crops are soy, cotton, and corn, crops that require large-scale mechanized production and that are not intended for direct human consumption. Almost 100% of crops are engineered to be either herbicide-tolerant or insect-resistant, or both. HT in particular is a very lucrative GM trait because it depends on the sale of the company's companion chemical (Monsanto's Roundup\textsuperscript{TM} glyphosate). It is estimated that over 80% of the global area planted with transgenic crops carries at least one trait for herbicide tolerance (ETC Group 2008:13). Gene stacking is an increasingly more common technology in GM crops, one that it is also comparatively more profitable: It is estimated that double and triple stacked traits generate nearly twice the profitability (ETC Group 2008:13). In 2011, the global market value of GM biotech crops raised to US$13.3 billion, representing 35% of the US$34.4 billion global commercial seed market (James 2011). Since 1996, the accumulated global value of GM crops is estimated at US$87 billion.\footnote{Op cit.}

Profit-making from seed development is a very recent event in the long history of agriculture as a technique (see Magdoff, Foster, and Buttel 2000). Seeds have historically been a public good, produced and reproduced by farmers. The third agricultural/agrarian

\footnote{Soy and corn are mostly used as ingredients for food products (i.e., as high fructose corn syrup and soy lecithin) and to produce biodiesel. Soy is also used as livestock feed. Cotton, of course, isn't food.}

\footnote{http://www.isaaa.org/resources/publications/pocketk/16/default.asp}

\footnote{Op cit.}
revolution has implied a progressive commodification of the seed as a mechanism for the accumulation and reproduction of capital (Kloppenburg 2005). The commodification of the seed, however, has been no easy matter: agriculture has historically been a difficult field for capitalism to colonize (Kloppenburg 2005). Once a farmer has acquired some seeds and a few animals, s/he is not dependent on the market anymore: After the cropping season, some seeds are sold in the market for income, some are consumed as grain (as food), and some are saved for the next growing season. Also, traditionally farmers grow a variety of crops and animals that are dependent on each other and that work as natural pesticides and herbicides. For example, animals in the farm provide manure that is used as fertilizer. Therefore, traditional farming practices, and the seed itself, are, by nature, against capitalist practices. Unlike any other commodity, seeds reproduce (Kloppenburg 2005; Shiva 1993; Shiva 2000). Thus, transforming the seed from a public good into a “commodity” became key to the development of industrial, corporate-led agriculture. This transformation was possible by developments in science (genetics) and the help of the government, which, by passing patent-like laws for genetically engineered seeds, allowed corporations to own germplasm, the genetic code of plants\(^\text{12}\) (Kloppenburg 2005). As such, GM seeds have become the cornerstone of the agro-industrial model of late capitalism (Kloppenburg 2005). This is what I will discuss next.

\subsection{2.2 THE AGRO-INDUSTRY & THE GLOBALIZATION PROJECT}

The agro-industry has its origins in the United States in the mid-20th century and later expanded to the rest of the world (McMichael 2000). The agro-industry is an

\textsuperscript{12} Legal hinge was the US Supreme Court decision on Diamond vs. Chakrabarty in 1980 (see Kloppenburg 2005).
energy-and-capital intensive model of agriculture: by contrast to traditional farming practices, this type of intensive agriculture requires constant external inputs which are provided through the market, such as machinery, oil, chemical pesticides and fertilizers, hybrid and GM seeds, corn- and soy-derived animal feedstuff for the meat sub-sector¹³ (Foster 1999; McMichael 2000). As McMichael (2000:129) argues, this is significant on two accounts: on a national (US) level, because it integrated the manufacturing and agricultural sectors ("fuelling post-Second World War prosperity" in the US); and on the transnational scale, because large agribusiness corporations started to coordinate input exchanges across countries. What occurs thereafter is a re-arrangement of the international division of labor as, in McMichael's (2000:129) words, "agro-industrial complexes (where agriculture is subjected to, and integrated with, industrial processes) were simultaneously nationally organized and internationally sourced." Poor countries of the Global South then enter the international circuit of food and agricultural technology as strategic agricultural-input and food suppliers. The Global South emerges as the "world farm" at the service of a minority of high-income global consumers, providing high-value foods such as off-season vegetables and fruits and feed crops to supply the factory farm complex (McMichael 2007:106-107). For example, now Chile supplies the US market with fresh fruits and farmed salmon, Thailand supplies poultry to Japan, South Korea and Taiwan, and Brazil and Argentina sell soybeans to fatten cattle in the EU and China.

¹³ The transition to industrial agriculture shows a classic treadmill-of-production technological trajectory: Energy (oil, machinery) and chemicals (fertilizers, pesticides) replaces labor in a process that reduces social benefits and increases ecological costs (Gould, Pellow, and Schnaiberg 2008, Schnaiberg 1980, Schnaiberg and Gould 1994).
For the Global South to provide food and raw materials to the Global North is hardly a new phenomenon: the extractive relation North-South has colonial roots. During the colonial period, in a process that Marx ([1867] 1990) described as of primitive accumulation, food and other commodities, in particular silver and gold, were shipped from the colonies in Latin America and Africa to Europe to kick start the Industrial Revolution in England in the 1800s. In this 19th century of British hegemony, the international division of labor gives a binary view of the world: the Metropolitan (European) world, specialized in industry, and the Peripheral (or non-European) world, specialized in raw materials. With this view of the world, 'development' post-WWII came to be understood as the process to overcome this division. Consequently, the governments of the Global South (then, the "Third World") heavily intervened to promote the domestic manufacturing sector (McMichael 2000:127). In Latin America, this is known as the ISI period, Import Substitution Industrialization.

What is most interesting is that, as McMichael argues (2000:127), in this 20th-century development paradigm, agriculture is "cast as the residual" and thus "a specialization to be transcended." According to McMichael (2000:129, 127) this view obscures two important facts: one, that for the US "development" did not mean transcending agriculture, but its subjection and integration to the manufacturing sector, in a model that is both inner- and outer-oriented, both public- and private-directed ("simultaneously nationally organized and internationally sourced")14; and two, "the parallel story of the politics of agribusinesses in reshaping global political economy and

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14 Keeping this in mind is most important with GM biotech under the Ecological Modernization mentality: Development through the subjection and integration of agriculture to industrial practices that are not polluting but cleaner, greener, more effective.
power relations." Hence the emergence of the Global South as the "world farm" is the latest period of a historical process that shows continuity, but one that also shows change: As an intrinsic part of the globalization process, corporations are at the helm, leading the way (Magdoff, Foster, and Buttel 2000; McMichael 2007).

The role of agribusinesses in re-shaping the geo-political organization of food production and distribution and the global political economy should not be understated (McMichael 2000). A number of institutional mechanisms, in particular, in the 1970s, the distribution of cheap food aid under Public Law 480 and foreign aid for the agricultural modernization program known as The Green Revolution to selected (peasant revolt-prone) Third World countries (South Korea, Mexico, India), were useful to promote agro-industrial technologies and crops (new markets for corporations; integrated commodity chains) and create food dependency on the US (McMichael 2000:130-2). The pressure exerted by the US to poor countries through the WTO also shows the extent of corporate power, and helps to keep expanding the web of the corporate agro-industrial complex over the Global South (McMichael 2000:137). (See also Raj Patel's *Stuffed and Starved*, where he does a great job in fleshing out the details of these processes). As with the transformation of the seed into a commodity (Kloppenburg 2005), corporations needed the institutional and monetary support from the state to expand a model of transnational agro-industrial production.\(^{15}\)

\(^{15}\) I do not want to imply that corporations "rule" without states and that states are powerless now. The agribusiness complex had (and needed) institutional and financial support from the US state, which benefited both corporations and the state. It is a power alliance; one cannot exert power without the other (Mills [1956] 1999).
Non-Traditional Agro-Export production in Latin America

In the late 1970s and 80s, with the collapse of the ISI project and immersed in a deep debt crisis, Latin American governments decided to reorient their economies outwards, promoting agro-industrialization and agro-exporting as the new model of socio-economic development (Llambi 1994). These are the beginnings of neoliberalism in the region.

Starting in the 1970s, a wave of coups d’états spread in Latin America – first in Chile in 1973, in Argentina in 1976. These dictatorships started sweeping socio-economic reform, based on a program of structural adjustments devised in American institutions, in Chicago and Washington (see Klein 2007). In the 1990s, with the return of democratic governments, this neoliberal program is legitimized in a package known as the “Washington Consensus” and neoliberalism becomes the official model of development for Latin America.

The neoliberal model proposed a re-organization of the international political economy based on the principles of free trade and comparative advantage on the belief that economic growth would bring, by spillover effect, social well-being (Harvey 2005a). In Latin America, neoliberalism was implemented through a series of structural adjustment programs and packages that generally comprised the end of subsidies and tariffs, privatization, deregulation, and permitting unrestricted foreign investment (Harvey 2005a).

From these neoliberal premises, two types of economic models arise in Latin America. One model is based on the maquila industry: assembly factories where low-cost labor assembles tax-free imported inputs (mostly textiles, cars, and electronics) for re-
export to the US market. This model is centered on Mexico and the Caribbean countries. The other one, the one I focus on here, is centered on the exploitation of natural resources that are processed (if at all) in capital-intensive plants that require little labor—i.e., vegetable oils, paper, fish, wine—and it is the model mostly adopted by the South Cone (Argentina, Chile, Uruguay, Brazil) and the Andean countries (Colombia, Peru, and Ecuador). This model is referred to as *Non-Traditional Agro-Export production* (NTAE) and it is based on the specialization of a few commodities for the export market (Kirby 2003:57). The countries that have adopted the NTAEs model are also known as NACs: New Agricultural Countries, in an analogy to the emergent Asian NICs, the New Industrial Countries (Taiwan, South Korea) (Friedmann 1991).

For the countries that adopted the NTAE model, increasing agricultural production was linked to mechanization and a general "modernization" of agricultural techniques. In order to do so, international financial institutions (IFIs) like the World Bank and the International Monetary Fund, gave conditional credits to governments that would "encourage" their farmers to invest in new foreign technology, taking credits to buy machinery and seeds (McMichael 2007; Shiva 2000). In this way, states, multilateral agencies, and transnational corporations worked in conjunction to set in motion the neoliberal project to modernize/mechanize agriculture as a means to development in Latin America (Llambí 1994).

The introduction of agro-industrial practices in Latin America implied a dramatic North-South technological and knowledge transfer. To the promoters of neoliberalism in the region this was a necessary transfer, the key to Development. This notion is well exemplified in the 1998-1999 World Bank report tellingly entitled *Knowledge for*
Development, which urges to "close the knowledge gap" between the knowledge-rich North and the knowledge-poor South. In this view, North-South technological transfers are presented as neutral and objective, a description that recalls well the modernization paradigm, where poor/underdeveloped countries will evolve/modernize as they adopt Western liberal values and techniques (Parsons 1977). Neoliberalism is the latest version of these beliefs, updated to embrace the technological developments of the 21st century, communication and information technologies in particular. Economic pundits like Thomas Friedman (2005) and Jeffrey Sachs (2005) represent well these ideas when calling for the end of poverty through the diffusion of Western technologies (the result of barrier-free markets) (understood also as a promotion of Globalization). These ideas also resonate well with Ecological Modernization theory in their unfettered belief in the promise of new technologies to solve the social and ecological crisis.

On the other side stand those who argue that North-South technological transfers are not a value-neutral enterprise, but much to the contrary these are understood to be a mechanism for colonization (Giarracca 2007; Lander 2000b; Santos 2009; Shiva 1991). For example, Vandana Shiva saw the Green Revolution in India not as a means to Progress but as a "techno-political strategy" to bring about peace and quell dissent through to the creation of food abundance (Shiva 1991). These authors argue that this type of science and technology, this "techno-science" as they term it, which is presented as objective, neutral, and universal, is rather part and parcel of the historically-rooted neoliberal development project (Giarracca 2007; Lander 2000a) and therefore reflect the interests of the institutions that produce them (Gould 2009), including pacifying restive populations (Shiva 1991). In this manner, techno-science becomes both a tool and a
discourse, an epistemology intrinsically linked to neoliberal values (Lander 2000a; Santos 2009). Its goal is the appropriation and control of nature, by promoting limitless growth through the exploitation of natural resources (Giarracca 2007). This is a repeated pattern, a new form of colonialism (Giarracca 2007; Lander 2000b; Santos 2009; Shiva 1991). Or, as David Harvey (2005b) put it, the continuity of Marx's process of primitive accumulation, capital's "accumulation by dispossession".

There is therefore a strong political and ideological component in North-South technological transfers. The IFIs call to "modernize" agriculture in Latin America is not void of power relations where nation-states, transnational corporations, and multi-lateral agencies have worked in conjunction to promote neoliberal-style development with the aid of science and technology. Later in this chapter I return to these issues, to discuss how contestation against GMOs has targeted primarily this objective/neutral discourse of science and technology and thus placed the struggle over control of natural resources. But before that I will describe in detail the discourses and arguments from GM supporters and detractors as a basis for further discussing these issues.

2.3 MAIN ARGUMENTS FOR AND AGAINST GMOS

This short section describes the main arguments and debates for and against GM biotechnology. As it should be evident by now, there is more to GM biotechnology than the technology itself. Contrasting the different framings of the technology given by supporters and detractors helps to further elucidate this point and opens up the question of why these different framings matter (a question I deal with in the next section).
Arguments in Favor of GM Biotechnology

Main arguments in favor of GM biotechnology can be summarized under five points:

1. **Science is Progress.** The notion that technological innovation will bring about Progress and Development in and of itself. This is related to what I have described above, in relation to the "modernization" of agricultural techniques.

2. **Economic Benefits.** Agricultural biotechnology promises increased yields and profits to farmers. This new technology is presented as particularly beneficial to smallholders and peasants in poor countries recognized as those who can benefit most from GM crop adoption (Qaim 2009).

3. **Environmental Protection/Sustainability.** Ag biotech promises a reduction in the quantity of chemical pesticides and herbicides released to the environment. Bt crops do not require pesticide spraying as the crop is genetically altered to be insect-resistant. No-tillage methods used in conjunction with RR GM seeds means a reduction of the soil-degrading consequences of plowing; plowing breaks the soil structure, no-tilling reduces soil erosion by maintaining soil moisture and nutrients.16

4. **Feeding the world.** The Malthusian argument is the most widely used to promote GM crops, which promise to feed a growing population in a world of diminishing resources. GM crops are presented as the solution to hunger and poverty through yield increases (produce more with less).

5. **Solution to crisis.** GM crops are presented as the solution to the world's most pressing crises: food, clothing, energy, and climate. According to the industry,

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new GM traits will be able to tolerate draught, flooding, extreme heat and other extreme climate conditions. Biofuels hold the promise of a cleaner and renewable source of energy.

These are a few examples of how GM promoters present these issues:

• Monsanto's corporate brochure:

People around the world depend on farmers for their most basic needs. But limited natural resources, increasingly unpredictable weather conditions, and a rapidly growing population pose serious challenges to farmers. These global challenges are complex and there are no easy answers. But one thing is clear: agricultural innovation holds a key solution.17

• ISAAA, The International Service for the Acquisition of Agri-biotech Applications:

Food, feed, fiber, and fuel for the world’s 800 million people who suffer from hunger and poverty – this is the formidable task for many countries, development agencies, and other interest groups. Of the many strategies that have been forwarded to address the issues of global poverty and environmental degradation, crop biotechnology is seen as a viable contribution to the solution.18

Arguments Against GM Biotechnology

Main arguments against GM biotechnology can be summarized under the following points:

1. Corporate concentration: Critics point at the horizontal and vertical integration of the agri-food system and its consequent corporate concentration (Heffernan 2000). In 2009, only three companies Monsanto, DuPont

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(Pioneer), and Syngenta controlled 53% of the global commercial seed market (ETC Group 2011). Monsanto is the world’s largest seed company and fourth largest pesticide company (ETC Group 2011). Four TNCs, named the "ABCD group"—ADM, Bunge, Cargill, and Dreyfuss—, account for 75-90% of the global grain trade.19

2. **Peasant displacement and rural poverty.** Critics argue that the introduction of agro-industrial techniques and GM crops have radically transformed rural life, increasing peasant displacement and rural poverty (Giarracca and Pérez C. 2001; Kay 2004; Kay 2008; Mooij, Bryceson, and Kay 2000). Authors thus claim that GM biotech is not a pro-poor technology as the industry promotes (Glover 2010; Schnurr 2012). Expensive patents and oppressive contracts are one of the main causes for farmer poverty (and suicide, when farmers can't repay their debts, see Patel 2008). Farmers' poverty and displacement also facilitates land consolidation.

3. **Threat to local cultures and knowledges.** The forced introduction of foreign knowledge and technologies dismisses local knowledge(s) as invalid (Giarracca 2007; Lander 2000b; Santos 2009; Shiva 1991). Traditionally farming is more than a food-producing activity; it is the locus of peoples' culture. The introduction of agro-industrial practices thus threatens cultural diversity. As represented by the motto of the international peasant movement Vía Campesina, the struggle for the seed is also the struggle for peoples' dignity and sovereignty.

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4. **Food insecurity.** Despite increased global food production, the number of hungry people keeps rising. According to FAO, nearly 870 million, or one in eight people around the world were suffering from chronic undernourishment in 2010-2012.\(^\text{20}\) This suggests that the problem of hunger is a matter of distribution rather than of production, as supporters argue. Amartya Sen (1981) was among the first to link famines to unequal access to resources and poverty.

5. **Impact on human health.** Critics argue that GMO crops pose real and potential (not-yet-tested) health hazards. Roundup glyphosate has been shown to produce endocrine (hormone) disruption, DNA damage, cancer, birth defects, and neurological disorders (1er. Encuentro Nacional de Medicxs de Pueblos Fumigados 2010; Comisión Provincial de Investigación de Contaminantes del Agua April 2010; Paganelli et al. 2010). The consequences of eating foods made with GM crops have not been sufficiently tested (Freese and Schubert 2004; Small Planet Institute 2012). An FDA report contains warnings about the "unique hazards" of GE foods, as they may contain "unexpected toxins, carcinogens, or allergens" (Moore Lappé 2011).

6. **Impact on the environment.** Despite supporters' claims, pesticide use has increased, in particular of Roundup glyphosate. No-tillage practices are beneficial but positive results have been offset by increased agro-chemical use.\(^\text{21}\) The use of Bt crops has impacted on other non-target insects, reducing populations of bees and the monarch butterfly. Agro-industrial practices are


\(^{21}\) No-tillage methods are also widely used in agro-ecology.
considered one of the main contributors of CO2 emissions and, thus, to global warming and climate change. Critics also warn of cross-pollination and gene-transfer between GM and non-GM crops (see Antoniou, Robinson, and Fagan 2012)

7. Not a solution but a "techno-fix". GM biotechnology is presented as a technological solution to global crisis. Critics argue that these are not real solutions but techno-fixes, partial and momentary, 'patch' solutions. Most important, critics argue that these technofixes come to 'fix' problems already created by the agro-industry: for example, Bt corn was developed to address the problem of corn borer infestation in large-scale corn monocultures in the United States (Buttel, in Marsden 2008).

8. Inadequate science. Critics argue that GMOs have not been held to standard testing and regulation before being released to the environment and being approved for human consumption (Antoniou, Robinson, and Fagan 2012; Freese and Schubert 2004; Small Planet Institute 2012)

A Short Discussion on These Two Perspectives

It is important to point out that these two perspectives have things in common: First of all, both sides claim to be helping out the environment and the poor. Second, they dismiss each other on the grounds of "science". Both sides bring up the notion of sound/unsound science to support their own view and dismiss the other. GM supporters
argue that biotech is positive because it is the consequence of scientific research and dismiss critics' concerns as not "sufficiently tested", or "without sufficient scientific evidence." Supporters also dismiss critics as luddites, as people fearful of progress. Fear and scare are, according to supporters, the means used by anti-GM people to set populations against GMOs. According to GM supporters, these obscure methods will not stand when faced to the light of science.

Critics also rely on the scientific argument to defend their position. For example, a recent report on GMOs released by Earth Open Source proposes to examine, based on "scientific evidence," the claims made by biotech supporters about GM crop safety and efficacy (Antoniou, Robinson, and Fagan 2012). The report then contrasts the "myths" brought forward by GM supporters to the "truths" revealed by scientific research. That the sound/unsound science argument can be equally brought forward by both pro- and anti-GM people radically questions the notion of an objective and neutral science (Schnaiberg 1977; Wright 1992). Yet, as I show in this dissertation, this is among the most common and strongest claims to make a case for or against GM biotech.

2.4 SOCIAL MOVEMENTS, QUIESCENCE, POWER

GM is a widely controversial technology that has been met with strong resistance (Stone 2010). Long before GM crops were commercially available there were people concerned about the safety, utility, and necessity of this new technology and thus

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22 Even though this is a circular argument, it makes sense when there is a strong belief on the intrinsic positive qualities of scientific research (as I have shown above).

23 This cartoon, created by the ISAAA, one of the leading promoters of GM crops, graphically summarizes the arguments for GM and how critics are portrayed: "Mandy and Fanny: The Future of Sustainable Agriculture." Available at http://www.isaaa.org/resources/videos/mandy_fanny/default.asp
organizing in response (Schurman and Munro 2003:111-112). In this section I first review the cases and grounds for resistance and mobilization against GMOs around the world and in Latin America in particular. Then, I look into social movement theory to address two questions, why do movements emerge and why do they fail to emerge. I thus explore quiescence and demobilization. In order to do so, I focus on the links between power and collective action.

**Resistance and Mobilization Against GMOs**

Social resistance to genetically engineered crops arose long before the new technology was released to the market in the mid-1990s (Schurman and Kelso 2003; Schurman and Munro 2003; Tokar 2001). Ever since then resistance and mobilization against GMOs around the world has only increased (Schurman and Munro 2010; Stone 2010). In this section I look at the most emblematic cases of anti-GM activism around the world and in Latin America in particular. It is important to note that while movements and campaigns have had (and still have) their moments of success, this is nothing like a "won battle." Actually, despite major wins by the anti-GM movement, the agricultural biotech industry stays strong, and has experienced a major recovery after 2005 boosted by a growing demand for biofuels and the 2008 hike in global food prices. At the same time, or probably due to this recovery, the anti-GM movement stays vibrant (Schurman and Munro 2010).

Anti-GM activism covers a wide range of actors with a wide range of concerns: farmers, scientists, environmentalists/ecologists, workers' unions, consumers; concerned citizens around the world have contested the GM biotechnology industry on economic,
environmental, social, cultural, political, and moral grounds (summarized above; see also Magdoff and Tokar 2010; Otero 2008; Schurman and Kelso 2003; Schurman and Munro 2010; Scoones 2008). A key feature of the anti-GM movement is its transnational character: global connections link anti-GM activists and debates through the internet, email lists, and meetings across the world. As such, the movement has gained relevance as part of the wider anti-globalization movement that came to the scene in Seattle in 1999 and has since then met and staged protests in a number of international events, from the WTO meeting in Seattle in 1999 to the yearly meetings of the World Social Forum (Schurman and Munro 2003; Schurman and Munro 2010; Scoones 2008. See also Keck and Sikkink, 1998; Tarrow 2005b). This globalization of protests has helped to publicize the movement at global level, bolstered by the growth of international anti-GM "stars," such as José Bové from France and Vandana Shiva from India, and the actions of other international organizations, such as Greenpeace, Friends of the Earth, and Via Campesina (Scoones 2008).

The anti-GM movement has a wide agenda that aims to a "broadening of the frame (...) beyond the technology itself" (Scoones 2008:326). As McAffee (2008:148) argues "[d]isputes about agricultural biotechnology are linked to wider conflicts about the cultural significance of food and farming, the consequences of trade liberalization and the global restructuring of food systems, and the role of agriculture in development." With this broader frame antibiotech activists have been able to bring these issues out into the public sphere, transforming GM crops "from an elite technological development into a highly contentious social problem" (Schurman and Munro 2010:xiii). Therefore,
transforming science from an allegedly objective and apolitical issue into a political one (Schurman and Munro 2010; Scoones 2008).

Despite its transnational character, the anti-GM movement is rooted in local struggles, processes, and debates (Schurman and Munro 2010; Scoones 2008; Stone 2010). Mobilization practices are local and context-specific and rooted in specific debates (Scoones 2008). For example, in France, small landholders organized under the Peasant Confederation has focused on the potential risks of GMOs based on a cultural framework of general distrust of industrial agriculture's instrumental rationality (Bonny 2003; Heller 2011). In Brazil, the Landless Workers Movement MST has inscribed the struggle against GM crops as an aspect of a wider struggle for democracy and agrarian reform (Newell 2008; Scoones 2008).

In the Global North, anti-GM activism is particularly strong in France and the UK (Bonny 2003; Doherty and Hayes 2012; Heller 2011; Schurman and Munro 2010). In the European Union, as in New Zealand and Australia, anti-GM regulation has been achieved, aimed mostly at protecting consumers from potential health risks of GM foods (Marsden 2008). In the United States, there is some anti-GM activism (Pechlaner 2012; Schurman and Munro 2010). Lately, the Occupy Food branch of the Occupy Wall Street movement has brought farmers and consumers together on this issue and has staged a few protests, for example, marching through the streets of New York City on December 4, 2011. In general however, the United States most resembles the case of Argentina, where GM crop expansion and promotion are the rule and the public remains mostly unaware and quiescent.
In the Global South, India is one of the most emblematic cases of anti-GM activism (Scoones 2008; Shiva 2000). In Latin America, Brazil and Mexico are the forefront of anti-biotech activism, but resistance has emerged in other countries as well, such as in Peru and Ecuador (Newell 2008; Otero 2008; Scoones 2008).

Contestation and resistance against GMOs in Latin America is brought forward mostly by rural and environmental movements and it has been framed within a wider criticism of the neoliberal model of agricultural production (Otero 2008). Rural and environmental movements in Latin America, as in the rest of the Global South, are closely intertwined, up to the point that sometimes the categories collapse: They are the peasants (who are also usually indigenous) the ones that mobilize around environmental issues (Lewis 2009). Some examples are the rubber tappers and the MST in Brazil, the "Water War" in Cochabamba, Bolivia, and the Mexican farmers' struggle to protect native maize from cheap imported US corn under NAFTA. The origin of Southern environmental movements is rooted in poor people's struggles to protect livelihoods, compared to Northern movements where environmentalism began as the enterprise of affluent people to protect recreational spaces\(^{24}\) (Lewis 2009). This is why they are also known as an "environmentalism of the poor" (Guha and Martinez-Alier 1997).

Anti-biotech activism in Latin America is thus inscribed within a wider struggle to protect and defend livelihoods, in particular after the dispossession consequence of the neoliberal programs implemented throughout. Thus new social movements have emerged, to fight against the agro-industry and GM as well as to fight other extractive and polluting activities, such as mining. These new social movements have at heart the

\(^{24}\) Yet closer to US environmental justice movements (Lewis 2009).
struggle for local (vs. transnational) control of natural resource use and decision-making (Giarracca 2007).

Social Movement Theory and Quiescence: Why Do Movements Emerge, Why Do They Fail to Emerge?

Social movement and collective action theory of the last three decades has almost exclusively focused on the issue of mobilization (Walder 2009): "Why do people mobilize?" or, rephrased, "Why do movements emerge?" have been the main questions raised by social movement scholars. Then, why do people mobilize? Klandermans (2001) argues that these are the components that explain why social movements come into being:

1. **Grievances.** There is a reason why people are discontent and they mobilize to address that issue. Thus, people mobilize to struggle against all kinds of injustices, from traditional issues such as class or religion, to “new” ones, such as gender, ethnicity, ecology (This is Touraine’s New social movement theory).

2. **Resources.** Not all aggrieved people decide to mobilize. Resource mobilization theory (McCarthy and Zald 1977) focuses on explaining the internal life/organizational aspects of a social movements, as it argues that only those that have the resources to do so, such as time, money, expertise, technical infrastructure, are the ones that effectively engage in collective action.
3. **Political opportunity.** *Political opportunity theory* (McAdam 1982; Tarrow 2005a) emphasizes the *context* of collective action. In contrast to resource mobilization's focus on the internal aspects of social movement formation, this perspective emphasizes the role played by the political environment, either by facilitating or constraining collective action.

Resource mobilization and political opportunity theorists typically downplay the role grievances have in accounting for collective action. Yet grievances are not ubiquitous, as these theories suggest. Therefore, from a social psychology perspective, another condition to social movement formation is:

4. **Frames.** The way people *interpret* their grievances is critical to participation.

*Frames* capture the culture dimension of movements and they serve both as “persuasive devices” (to capture adherents) as well as “interpretive frameworks” (Poletta and Ho 2006:190; Snow and Benford 1988).

While these theories are usually introduced as competing explanations to social movement formation, I follow Klandermans’ approach of considering each of these conditions not as exclusive but as *complementary* explanations. Taken together, these conditions build a better explanatory framework (Klandermans 2001). Schurman and Munro's (2010) analysis of anti-biotech activism also favors this complementary approach, and in doing so they argue that, for a social movement to emerge it is necessary that (1) a *social problem* exists, and (2) that there are *opportunities for activism*.

First, therefore, there has to be an issue or situation that is understood, perceived, or framed as a *social problem*. It is not enough that a situation of inequality, threats to health, or environmental damage exists objectively, not even that it is experienced
directly and visibly to a group of people (Auyero and Swistun 2009; Gould 1993). As social movement scholars have long argued, potential grievances are ubiquitous. Thus, as Schurman and Munro (2010:xv) succinctly put it, "[f]or a given situation to be widely understood as a social problem (i.e., as a problem that demands attention and remediation), some group has to form an oppositional consciousness around it and identify it as a problem. This requires an act of interpretation." (authors' italics). Framing therefore is key. How supporters and detractors frame GM biotech shows how different ways of interpreting the technology lead to different reactions; up to a point that there might be no middle ground for discussion among these groups, as the debate is not about the technology anymore but of different worldviews (Schurman and Munro 2010).

Second, for a movement to emerge, there have to exist opportunities for activism; that includes, the availability of resources and a context (political, institutional, cultural) that are conducive to the movements' success (Schurman and Munro 2010). Because of the global, transnational, and corporate nature of the agro-industry and its tight links with the nation-state, the structure of the global political economy is the background on which anti-GM struggles take place (to account for this globalized context, Pellow (2007) broadens MacAdam's (1982) notion of political opportunity into the political economic opportunity structure).

The notion of framing for the construction of grievances is thus key for the emergence of mobilization, for who would protest without a good reason to do so? According to Schurman and Munro (2010:xvi), the act of framing is grounded on a "cultural predisposition" each person carries, the "shared mental worlds that incline people towards particular ways of thinking and seeing." Schurman and Munro's (2010)
analysis on anti-GM activism is influenced by Alfred Schutz and Habermas' theories and thus heavily focused on actors' interaction. In this dissertation I diverge from this micro approach to explore the links between framing and the social structure. In doing so I rely on traditional social movement and contentious politics theory. As Walder (2009:394) argues, the wealth of research by social movement scholars has given a "false sense of intellectual breadth, obscuring the enduring narrowness of the focus on mobilization."

Before the rise of these current approaches to the study of social movement organization and collective action, the focus was on the relationship between social structure and politics (Walder 2009).

The first studies in this tradition are rooted in Marx's class analysis and aim to link social movement theory to politics, protest, and power (Walder 2009). Paige's (1975) study on agrarian revolutions is a clear example of this tradition. In this work, Paige (1975) argues that agrarian movements in the 20th century arose as rural class struggles (cultivators vs. non-cultivators) around land control. Land issues and agrarian reform were at the core of peasant struggles in the 20th century (Moore 1966; Paige 1975; Wolf [1969] 1999). In the 21st century, neoliberalism has transformed the "peasant" (see Giarracca and Pérez C. 2001; Kay 2004; Kay 2008; Mooij, Bryceson, and Kay 2000) and thus new movements have emerged, infused with new identity demands (Escobar and Alvarez 1992). The issue of land, however, is still unresolved; neoliberalism and globalization imply new forms of dispossession: land grabs, water grabs, etc. The fight over the seed (to maintain agriculture GM free) of rural and environmental movements in Latin America is infused with these issues; it has at its core the struggle over control of

natural resources (Giarracca 2007, Teubal 2009). Current agrarian/rural struggles in Latin America therefore target the model of industrial agriculture and the transnational corporations that promote it (Teubal 2009). These “new agrarian social movements” have emerged, in places like Brazil, Mexico, Guatemala, Bolivia, and Ecuador, to fight for those still unresolved issues but now under new conditions (Teubal 2009). In this context, social movement theory cannot be delinked from politics, protest, and power. In particular, it helps to broaden social movement theory's exclusive focus on mobilization (Walder 2009), a strong limitation when the focus of study is, as it is here, lack of mobilization and quiescence.

Framing can be understood as the missing link between the mobilization and the politics/structural traditions in social movement and collective action theory. As Walder (2009:406) argues, framing, the subjective dimension of mobilization, leads back "to the question of the social structural circumstances that make certain interpretative frames, collective identities, or emotions salient to potential participants in a movement." To this, Walder (2009:406) adds, "the idea that individuals' social experience (including but by no means limited to economic interests) affects their receptivity to different ideas, or frames, through which they understand their world is inherent in the very idea of framing. This is the core question that ideas about framing raise in pursuing the question of a movement's political orientation: What social circumstances determine the receptivity of one frame over another?" Now this question could be broadened to ask, *what social circumstances/social structure create or make possible the existence of one frame over another?* What if/when if frames conducive to mobilization and protest fail to arise? The most obvious result is quiescence.
Quiescence and Power: The Missing Link in Social Movement and Collective Action Theory

The question of quiescence is a very important question for social movement theory and yet one that has been little explored (Edelman 2001; Gaventa 1980; Lapegna 2011). Social research on collective action's narrow focus on mobilization (Walder 2009) has as its main consequence an even narrower focus on the visible aspects of mobilization: where and why social movements emerge, who participates in them, what strategies and repertoires do they use. This dissertation questions this “positivist” view of social movement theory as it brings the issue of lack of participation to the same level of importance as the study of collective action (See Burdick, in Edelman 2001:311).

The study of quiescence is not without problems, not least because it is not easy to distinguish quiescence from consensus. However, that people do not protest does not mean that there are no grievances, for (1) grievances are ubiquitous and (2) that even when grievances are right out there, visible to the naked eye, people may not protest (see Auyero and Swistun 2009; Gould 1993). Therefore, the fact that there are no apparent or aired grievances (and thus quiescence) does not imply consensus or a shared sense of justice. The question then becomes, why and how, in cases of quiescence, are grievances not framed as such? As Walder (2009) implies, it has to do with the social structure. Lukes (2005) gave a related answer: it has to do with the workings of power.

Steven Lukes, in a small book first published in 1974, entitled Power: A Radical View, sketched what he conceptualized as the "third dimension" of power, that further dimension of power that "prevent[s] people, to whatever degree, from having grievances by shaping their perceptions, cognitions and preferences in such a way that they accept
their role in the existing order of things" (Lukes 2005:28). Lukes' proposal was "to think about power broadly rather than narrowly –in three dimensions rather than one or two" (Lukes 2005:1). The One-Dimensional view of power, the notion of power of the 'pluralists,'26 focuses on observable behavior in decision-making over which there is actual and observable conflict. This (overt) conflict is between subjective interests, seen as policy preferences, and revealed by political participation (Lukes 2005:16-19; 29). The Two-Dimensional view is a qualified critique of the behavioral focus of the first dimension, proposing that, by contrast, there is another face of power, arguing that "to the extent that a person or group –consciously or unconsciously– creates or reinforces barriers to the public airing of policy conflicts, that person or group [also] has power" (Bachrach and Baratz, qtd. in Lukes 2005:20). Thus, authors within this view argue that both decision-making and nondecision-making are to be examined in any analysis of power (Lukes 2005:22); non-decision making being "a means by which demands for change in the existing allocation of benefits and privileges in the community can be suffocated before they are even voiced; or kept covert; or killed before they gain access to the relevant decision-making arena; or, failing all these things, maimed or destroyed in the decision-implementing stage of the policy process" (Bachrach and Baratz, qtd. in Lukes 2005:23). Thus, in this view, "it is crucially important to identify potential issues

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26 Lukes' Power: A Radical View was part of an ongoing debate about power, powerlessness, and domination among American political scientists and sociologists in the 1950s and 60s. At the heart of the debate where the arguments raised by C. Wright Mills in The Power Elite (1956) and Floyd Hunter's Community Power Structure: A Study of Decision Makers (1953) (Lukes 2005:1). The One-Dimensional view is often called the 'pluralist' view of power, main authors being Robert Dahl, Nelson Polsby and Raymond Wolfinger (Lukes 2005:15). The view of the pluralists' critics Lukes' calls the Two-Dimensional view, this critique raised mostly by Peter Bachrach and Morton S. Baratz in 'The Two Faces of Power' (1962).
which nondecision-making prevents from being actual" (Lukes 2005:23). This view therefore expands the discussion of power by bringing in the notion of mobilization of bias into the discussion of power (Lukes 2005:20).

Lukes (2005) agrees that it is crucial to identify potential issues that are suffocated by nondecision-making. However, he critiques this view on the basis that, as the one-dimensional view, it continues to focus on actual, observable conflict, whether it is overt or covert (Lukes 2005:23). By contrast, Lukes argues that lack of actual, observable conflict does not imply consensus, raising the point that conflict could actually be potential or latent. This is the third face or dimension of power, which is the form of power that secures consent to domination of willing subjects (Lukes 2005:109). Therefore, "averting both conflict and grievance through the securing of consent" (Lukes 2005:111). This is, in Lukes' (2005:28) terms, the most "invasive and insidious form of power."

The concept of a third dimension of power makes possible to conceptualize and analyze how potential issues are kept out of politics, even in the absence of actual, observable conflict. Lukes suggests that researchers should look for the potential for conflict (having in mind that this potential might never be actualized); and, in particular, for latent conflict, "which consists in a contradiction between the interests of those exercising power and the real interests of those they exclude" (Lukes 2005:28; author's italics). To this Lukes adds that people's real interests may never be expressed and they may even remain unconscious. Many questions thus arise: What are these 'real interests' that are different from people's declared/avowed interests? How do we, as researchers and outsiders, know better than the subjects of study so that we know what their real
interests are even when those remain unconscious and unavailable to them? Moreover, we should also ask about the interests of those exercising power without taking them for granted, so that we can properly contrast the interests of the powerful to those of the powerless.

The question of 'real interests' as something that we, as researchers and outsiders, can ascertain has been critiqued as condescending and patronizing (see Lukes 2005:114-148 for counterarguments). If people's interests are "many, conflicting, and of different kinds" (Lukes 2005:147), how could I, as an outsider, claim to know better, for example, that people's avowed religious or moral interests conflict with their 'real' or best economic interest? Or any interests of another kind? There is certainly the risk of imputing to the subject of study our own interests and values. On the other hand, however hard, the task is not utterly impossible. As Lukes suggests, the stated 'real' interests are not a definite set that works all across, but rather a function of the "explanatory purpose, framework, and methods" of each particular study (Lukes 2005:148). For this dissertation case study, I had also a 'checklist' at hand, which included a list of grievances and issues raised by members of anti-GM social movements (listed earlier in this chapter) as well as a list of potential issues that could be constructed as grievances (issues that result from the expansion of GM soy monocropping in Argentina, described on the next chapter). That checklist I took with me to compare and contrast to my subjects' declared interests. I must say that, at times, it was not easy (or even possible) for me to ascertain that potential for conflict. For example, one item in my "potential grievances" list was losing access to fresh foods, as GM soy replaces fruits and vegetables grown locally. And while this is a grievance raised by peasants in the North, it was not an issue for most rural inhabitants in
the Pampas, for whom the fruits and vegetables that are part of their diet are either bought in a grocery store or grown in small *huertas* in their own backyards.

At other times, however, it was impossible not to think of a contradiction, as when people described how airplanes spray agrochemicals over the farms bordering towns and thus over their homes and workplaces.\(^{27}\) Is employment a best interest to wellbeing? Some people trade employment for health (in particular it seems to be the case among the powerless, see Crenson 1971; Gaventa 1980; Lukes 2005). However, at baseline, I intuitively agree with Lukes (2005) and Crenson (1971) in that it seems a good argument to hypothesize that people would have an interest in not to be poisoned.\(^{28}\) In the body of this dissertation I delve further into the issue of agrochemical spraying and grievance-making, and, most importantly, on grievance-suffocation. As I argue in chapter 6, among the women in particular, illness and health emerged as those underlying, unexpressed grievances that Lukes (2005) indicates as potential source of conflict.

It is important to note that the most common critique of the notion of the researcher as an external agent that can tell 'real' interests from declared interests are those related to criticisms to the Marxist notion of 'false consciousness' (see Lukes 2005:144-148 for counterarguments). False consciousness, in Marxist analysis, is the result of class power: the ideas of the powerless are those of the ruling class (Marx and Engels [1845] 1998). These ideas of the ruling class constitute a 'dominant ideology,' which appropriated by the working class as their own inhibits the development of a revolutionary consciousness (Abercrombie and Turner 1978). As stated above, I follow

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\(^{27}\) I delve further into these examples in chapters 5 and 6.

\(^{28}\) It is not that for these people health is not an interest or value. On the contrary, research shows that the powerless are structurally forced into trading health for their livelihood (see Crenson 1971, Gaventa 1980, Gould 1993).
Lukes (2005) in noting that people's interests – and identities – are not monolithic but rather multiple and conflicted, and not confined by class position (Lukes 2005:145). The mechanism, explored by Marx and Engels in *The German Ideology* and further developed by Antonio Gramsci (1972) with his concept of 'hegemony' is, nonetheless, at the root of the notion of the third dimension of power: a mechanism of power that shapes desires and beliefs to secure compliance to domination (Lukes 2005).

Antonio Gramsci's notion of hegemony addresses the question of how and why willing subjects comply with domination (for Gramsci in particular, with capitalist exploitation). Away from orthodox Marxist explanations, Gramsci (1972) emphasizes the cultural and ideological aspect of domination, arguing that through institutions such as the school, the press, and the church, the traditions, values, beliefs, and mores of the powerful are transmitted to the powerless who internalize those as their own, producing consent. To Gramsci, as to Lukes, creating cultural, ideological, and political consent is key to an effective exercise of power (understood as the maintenance of the status quo). In chapter 4, I look into the interests of the powerful which combined create a hegemonic discourse of GM soy production in Argentina (in relation to the technological package and as the preferred agro-export commodity suited for Argentina's comparative advantage). I argue that those that control natural resources and agricultural production in Argentina, the agribusinesses and the state, share common economic interests but also a particular positive framing of GM biotechnology which is the shared hegemonic discourse on the GM soy model in Argentina.
One Last Note on Quiescence

Gramsci (1972) notes that quiescence does not always imply willing consent, a point also entailed in the second dimension of power (Lukes 2005:21). Hegemony is certainly not infallible. Counter-hegemonies are possible and co-exist with hegemonic forms (Gramsci 1972). Beyond consent, power has many forms to maintain quiescence and the status quo: force, coercion, and violence are the most effective when consent cannot be gained by peaceful means (Gramsci 1972). It is important to emphasize, thus, that the three dimensions of power co-exist and function together to generate quiescence (Gaventa 1980).

Moreover, it is also the case that some seemingly quiescent are subtly resisting in such ways that the appearance of submission is, in fact, a strategy for survival (Scott 1985). It is also the case that others willingly comply because they get something in return for quiescence, i.e., wives that get their status and welfare through husbands (Lukes 2005:10, 138; Tilly 1991). I do not want to imply that people are 'dupes' and quiescence and consent is all there is. Therefore, my last point underlines the fact that power always meets resistance and that both quiescence and rebellion, in visible and subtle ways, coexist (Lukes 2005:150-151).
CHAPTER 3. GM SOY IN ARGENTINA

This chapter provides a background for analysis. Therefore, here I look at the context of adoption and expansion of GM soy in Argentina. First, I describe the extent of the expansion of the monocultures of GM soy in Argentina. Then, I explore the historical context of GM soy adoption in Argentina, focusing in particular on the neoliberal restructuring of the 1990s, which provided the necessary political, economic, and legal framework for the introduction of GM seeds in Argentina. In 2001, a major crisis hit, which marked a drastic reorientation of the political economy towards the left, which prompted the emergence of the Kirchners' administrations and their National and Popular model as an alternative to neoliberalism (still in place today). I analyze how the government has dealt with the consequences of the 2001 crisis and the heritage of the neoliberal 1990s: the GM soy-based Non-Traditional Agro-Export (NTAE) model. I argue that despite major changes the Kirchners' administrations have in fact not dismantled the mode of production set in place by the previous neoliberal administration. Much to the contrary, as I show throughout this dissertation, both directly and indirectly the Kirchners' administrations have created favorable conditions for the expansion of GM soy. The last section on this chapter focuses on the socio-environmental impact of GM soy adoption and expansion in Argentina. I conclude by assessing GM soy production as a model of development based on agro-export production, and I argue that the negative socio-ecological consequences of GM soy production make the model unsustainable.

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29 This chapter is based on a peer-reviewed article now in press.
This last section lays the ground to discuss the main question this dissertation addresses: if the negative consequences of GM soy production are so widespread, why don't people react and protest? The following chapter addresses quiescence in the Pampas.

3.1. ADOPTION AND EXPANSION OF GM SOY IN ARGENTINA

The adoption of the technological package of GM soy took place first in the Pampas, Argentina's historic core of agro-export production. Covering the center provinces of Buenos Aires, Entre Ríos, Santa Fe, Córdoba, and La Pampa, the Pampas is an ecoregion especially suited for farming and cattle ranching, a vast flatland of highly productive land (see Figure 1). Over 80% of GM soy production in Argentina takes place in this Pampas region (MINAGRI-Same as Fig. 1). In the last few years, production has expanded beyond this core, into the northern provinces of Chaco, Santiago del Estero, and Salta.
Figure 1. Map of Argentina, Pampas Ecoregion, and Area of GM Soy Production

Source: Author, based on data from the Argentine Ministry of Agriculture, Livestock and Fishery (MINAGRI).
By the time the technological package of GM soy enters the Argentine Pampas in 1996, farmers had already been planting soy and experimenting with the adoption of new agrarian technologies (Barsky and Gelman 2001). Argentine farmers started to grow soy in the Pampas in the summer of 1970. In this first growing season (1969/70), production accounted for a mere 30.5 hectares that yielded meager results: 26.8 tons produced (see Figure 2). By the end of the 1970s (season 1977/78), there is the first boom in soy production after the adoption of new agrarian technologies brought by the Green Revolution: hybrid seeds, mechanization, fertilizers, and herbicides (Barsky and Gelman 2001). The adoption and intensification of agro-industrial techniques, which replaces labor by fuel and energy intensive machinery and chemical inputs, results in increased production (but not yields necessarily) as they allow expanding over a bigger area as well as to plant more seeds/plants per acreage, increasing total final output (Schnaiberg 1980). For the 1977/78 season, the area planted with soybeans increased from a few hundred hectares to over a million (from 442.5 ha in 1975/76 to 1.2m ha in 1977/78) and production soared: 2.5 million tons of soybeans were harvested by the end of the summer of 1978.

During the eighties and nineties, until the introduction of the new GM RR soy variety, production grew steadily, adding an average of 267,000 hectares a year, reaching six million hectares by 1995/96. For the 1996/97 season, the first year the new Roundup Ready variety was available, the average area increase rate doubled in just one season: In the summer of 1996/97, almost 670 thousand hectares planted with soybeans were added.

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to production, to reach 6.67 million ha. Just like the Green Revolution in the seventies, labor saving/replacing technological innovation made possible production in much higher scales (Schnaiberg 1980). Since the introduction of GM soy, an average of almost a million hectares were added to production every year (900,799 ha, average between 1998/99 and 2011/12), to cover 18.7 million ha by the planting season of 2011/2012.

**Figure 2. Soy Planted (in Hectares) and Production (in Tons), Annually.**

Source: Argentine Ministry of Agriculture, Livestock and Fishery

As the area planted with soybeans increased so has production (see Figure 2). From the few dozen tons produced during the early seventies, the massive increase in area planted in the season 1977/78 yielded a soybean bounty: 2.5 million tons were harvested that season. Since then, soybean production has grown yearly, running apace
with increasing land under cultivation, reaching 20 million tons in 1999, 30 in 2001, and 40 million tons in 2005. The 50 million mark was passed for the 2009/2010 season, production reaching 52.7 million tons. For the 2011/2012 season, production was down to 40 million tons, a reduction that is consequence of the damaging effects of this year's drought.31

As production soars, so do exports. GM soybeans produced in the Argentine countryside are not meant for domestic consumption but for export, China being its main destination. In 2010, 83% of soybean production was shipped to China as feedstuff for their livestock sector.32 The 'soy complex,' as the package of soy-derived products for export is termed (including beans, oil, and pellets), accounts for 70% of the country's total agricultural revenue.33 Considering that agricultural exports represent over half of total exports in Argentina,34 the weight of soy production in Argentina's economy is enormous.

3.2 CONTEXT OF GM SOY ADOPTION IN ARGENTINA

The introduction of the GM biotech package and neoliberalism have gone hand in hand in Latin America as in many nations of the Global South; but nowhere to the extent as it has in Argentina (Otero 2008). In the 1990s, Argentina fully embraced neoliberalism and a model of development based on Non-Traditional Agro-Export production (NTAE).

34 (50.7%) WTO, Country Profile: Argentina (data until Oct 2011)- http://stat.wto.org/CountryProfiles/AR_e.htm
The neoliberal economic restructuring gave the necessary institutional and ideological framework for the introduction of GM seeds in Argentina.

In 1991, President Carlos Menem and Minister of Economy Domingo Cavallo signed the Deregulation Decree as part of their Convertibility Plan to end hyperinflation and promote growth. The Convertibility Plan gave the final neoliberal twist to Argentine political economy, as it ended all regulations that protected domestic economic activity: such as the import and export sectors of goods, services, and capital; foreign direct investment; and transportation (Carranza 2005; Ferrer 2004). It was the end of the ISI development paradigm. This decree also wiped out, overnight, all boards that had regulated agricultural activities since 1930 (Barsky and Gelman 2001; Teubal 2008). In 1996 the Argentine government approved the commercial use of Monsanto's Roundup Ready® (RR) soybeans, engineered to be resistant to Monsanto's bestselling herbicide, the glyphosate Roundup®. The Convertibility Plan became the backbone of Argentina's neoliberal era: The Convertibility Law was the core of the Plan, which pegged the Argentine peso to the US dollar at a fixed exchange rate of one-to-one (Ps1:1US$). In a context where foreign currency was kept artificially low, there were no import taxes, and a weak legal framework for GM seed use was in place, it became enticing to switch production to GM soy (Pengue 2005).

GM soy production comes in a 'technological package' comprised of the 'no-tillage' or direct seeding machinery, the transgenic soybean seeds, and the weed-control agrochemical, Roundup glyphosate. The adoption of the package promised dramatic cost reductions, for it requires less inputs and less labor than conventional crop growing. GM seeds, patented and owned by corporations, are typically a matter of contention for
farmers (Shiva 2000). Patented seeds are expensive and, under contract, cannot be saved for the next growing season, as is the tradition in agriculture.\(^{35}\) Interestingly enough, Argentine farmers do save seeds and customarily do not pay technology fees of the GM biotech crops they plant. Argentine farmers are protected under the International Union of New Varieties of Plant Agreements 78, so farmers can –and do–plant their own saved seeds (Pengue 2005). There is also in place a black market for GM soybean seeds, generally bought in unlabeled white sacks, which farmers refer to as *bolsa blanca*. The significant loss from technology fees for Monsanto's patented RR soybeans is, as expected, a source of dispute between the agribusiness and the Argentine government\(^{36}\) (Newell, 2009). For farmers, the result is that seeds are not an expensive component of the technological package. All together, the adoption of the package represented a dramatic cost reduction, as imported glyphosate was cheaper than other agro-chemicals in use, seeds could be saved, and the no-tillage method reduced the price of labor and fossil fuel use (Bisang 2003). According to producers, the package "simplified" production, as glyphosate replaced a gamut of more expensive agrochemicals and fields needed to be sprayed less often, thus reducing the number of times that machines need to enter the field, also reducing fuel and labor. Efficiency –understood as a reduction of costs and time that results in increased profits– is thus achieved. Growing GM soy thus became the cheaper and most profitable option, more than any other crop. Bisang (2003:437)

\(^{35}\) The commodification of GM seeds has been possible thanks to legislation that prohibits farmers from saving patented seeds and thus forces them to buy seeds every farming season (See Kloppenburg 2005).

\(^{36}\) This situation is currently under heated debate, as Monsanto is in negotiations with the Argentine government to revise the Seed Law in exchange for releasing its newest GM soy variety, Intacta RR2 Pro. More details on this on chapter 4.
estimates the switch to the technological package of GM soy represented a 15% profit increase compared to the use of conventional techniques in soy-maize rotation.

**Current Context: The Kirchners’ Administrations**

The neoliberal model implemented in the 1990s collapsed by the end of 2001, leaving behind a shattered country: Over half of Argentines were living in poverty, amongst the highest rates of inequality in history, and immense amounts of despair in a context of institutional, political, and economic crisis (for an in-depth explanation of the 2001 crisis, see Carranza 2005; Teubal 2011). A massive external debt was one of the main consequences of the neoliberal structural adjustment program of the 1990s and, later on, one of the main catalysts of the 2001 crisis (Teubal 2011). By the end of 2001, external debt rose to 144 million US dollars, accounting for 43.4% of GNP (Teubal 2011:79).

After a year of a transition government, Néstor Kirchner was elected president in 2003 with a leftist platform and a strong anti-neoliberal discourse. Commanding shoulder-to-shoulder with his wife Cristina Fernández de Kirchner –who succeeded him in 2007 and was reelected until 2015–, the presidential couple has set in place what they have termed as a "National and Popular" model. The Kirchners' National-Popular model, which Ms. Fernández professedly furthers ever since Mr. Kirchner's death in October 2010, aligns with –and is part of– the turn to the left in Latin America.37

The National-Popular model that the Kirchners' administration proposes contrasts with the hands-off, shrink-the-state mentality of the neoliberal 1990s. The new model is

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37 On the rise of the Left and the emergence of National-Popular regimes in Latin American, see Castañeda 2006, Vilas 2006).
rooted in strong government intervention, based on the principle that it is the
government's role to promote economic growth and redistribute it to target poverty and
promote social inclusion. Now in place for a decade, the Kirchners' model has been
successful in establishing and funding a national network of social plans and programs as
well as projects dedicated to infrastructure development.

To bring the state back in, as the Kirchners' have done, massive amounts of funds
are necessary. The key question a government in crisis faces is how to amass the
necessary funds to kick-start the economy. Taking on debt is always a possibility, but not
for post-2001 Argentina, which had already defaulted on its external loans.38 After the
2001 crash, the transition government—President Duhalde and Minister of Economy
Lavagna—took a series of high-impact measures to deal with the crisis: to default on
Argentina's debt and to end the Convertibility Law, the peso's decade long 1-to-1 peg to
the US dollar. By 2004, after the peso's devaluation, Argentina's external debt went up to
over US$191 million, accounting for 112% of GNP (Teubal 2011:79).

A comprehensive debt restructuring was an extremely important piece in the story
of Argentina's revival. After Néstor Kirchner's debt exchange in 2005, external debt had
dropped to US$ 126,6 million, 74% of GNP (Teubal 2011:79). The other key piece of the
revival story was—and is—the GM soy-based revenue. Once out of the crisis, GM soy
exports were hailed as the country's savior, the single source of fresh flows of foreign
currency (Newell 2009a; Teubal 2006; Teubal 2008). Duhalde and Lavagna's transition
government had devalued the peso (Ps3-4:1US$). It had also reinstated export taxes

38 It was, in fact, a partial default: Argentina defaulted on its external private debt but
continued to pay its debt to the IMF and other international financial organizations (see
Teubal 2011).
established by President Perón in mid-20th century (Barsky and Gelman 2001). Now with more pesos for every dollar and high commodity prices, the State's ability to retain a fraction of total exports meant millions of pesos to the dry state coffers. Mr. Kirchner inherited these economic measures at an exceptional historic moment, where international commercial and financial conditions were beneficial to Argentina's agro-export model. Real GDP, which had bottomed in early 2002, rebounded to grow by an average of 8.5% annually over the subsequent six years.\(^{39}\) Even through the global financial crisis of 2008 Argentina's economy remained stable, due largely to agricultural exports. Increasing soy exports and a very successful debt restructuring had translated in a surplus in the balance of payment. With this surplus available, Kirchner was able to return to a model of state intervention, investing in infrastructure and social spending, without enacting major structural reform (Svampa 2008).

Néstor Kirchner's administration (2004-2007) heavily promoted the expansion of the agro-export development model based on GM soy monocropping. A 10-year Development Plan, planning towards 2015, places agricultural GM biotechnology at the core of Argentina's development strategy. The goal of this Plan is to promote "long-term development" by promoting an intensive use of imported science and technology applied to agricultural production—Argentina's "comparative advantage" (SAGPyA 2004). The new GM biotechnologies are the key to development as they promise to exploit Argentina's potential, to increase productivity of agricultural output.

Cristina Fernández's administrations (2007-2011; reelected for a second term until 2015) represent a continuity of Mr. Kirchner's model (or even its "deepening" or

intensification, which has been Ms. Fernández's slogan since Néstor's death). Thus, the agro-export development model based on GM soy monocropping under Ms. Fernández government continues to expand. The agricultural Strategic Plan 2010-2016, known as PEA2, is as another example of the continuity of the model as it focuses on increased production through technological innovation, i.e., agro-industrial practices. Once again, the Plan also distinguishes Argentina's unique capabilities to produce food, a globally demanded product.\footnote{PEA2, Plan Estratégico Agroalimentario y Agroindustrial Participativo y Federal, 2010-2016. www.minagri.gob.ar/site/areas/PEA2/index.php}

The present global context is particularly beneficial to Argentina's GM soy based agro-export model. An increase in global food demand based primarily in China and India, increasing financial speculation, and crops diverted to agrofuels created, by 2008, the perfect storm; food scarcity, hunger riots, and a spike in commodity prices (Magdoff and Tokar 2010). In the midst of this crisis, in Argentina, government and producers were ecstatic; soy production was a gold mine. The government decided that these extraordinary conditions necessitated extraordinary measures. In March 2008, Ms. Fernández signed a decree to lift the government's share in export revenue, increasing existing soy export taxes from 30\% to a floating rate tied to international prices (at higher commodity prices, the higher the export tax). In response, soy producers, big and small, hit the streets, backed by a very significant share of the rural and urban population discontented with the presidential couple. A three-month strike became known as \textit{el conflicto del campo}, the conflict with the countryside, which is considered by some to be the most important agrarian conflict in Argentine history (Barsky and Dávila 2008).\footnote{I delve further into the 2008 \textit{conflicto del campo} in chapter 4.}
This attempt to raise export taxes exemplifies the Kirchners' approach towards GM soy production in Argentina: It is not about regulating the activity but about the allocation of surplus, as it is soy-derived revenue that makes it possible to sustain the national-popular model without abandoning neoliberal agri-business development (Richardson 2009).

The Kirchners' administration has also indirectly promoted and encouraged GM soy expansion through actions and policies that were originally presented to promote wealth redistribution and to secure food for domestic consumption, as part of the general national-popular orientation. For example, price caps and export quotas to specific agrarian products—in particular, wheat, meat and milk—have been set to secure domestic food demand, in particular in response to the 2008 global food crisis. This measure, while celebrated by many, has had the unintended effect of pushing more growers towards GM soy. The moratorium sounds "right," as it serves to protect domestic needs (in particular in the face of a global food crisis, see Bello 2009; McMichael 2010). However, as the measure was not paralleled with others measures that would encourage alternative food production, such as credits or tax breaks for small growers, it brought the unintended consequence of actually expanding the GM soy model.

As rural producers organize production on the basis of profitability, if growing soy is an option (i.e., if the depth of soil, humidity, and nutrients are optimal) they will likely choose soy over other crops or cattle, at least for as long as current conditions remain, in particular high international prices and no caps for exports, neither in price or quotas. Producers from the Pampas southwest, where environmental conditions are not optimal to grow GM soy, complain of being "stuck" with wheat growing, which has price and export caps, and are envious of the "lucky" ones that can grow soy. This is the
southern frontier of the GM soy expansion (see Figure 1). This border is drawn by environmental limits and not by rural producers' preference for other crops. Nowadays, a new GM soy variety is being developed that will allow planting soy south of this border, into the Patagonia region; a development certainly linked to Chinese land grabs in the Río Negro province.\footnote{In October 2010, a Chinese state-owned agribusiness, Beidahuang, and the government of the Río Negro province, in the Patagonia region, signed a 20-year lease over 320,000 hectares to produce GM staple crops aimed for the Chinese market (Lopez-Gamundi and Hanks 2011).} Considering patterns of adoption of agricultural technologies it is likely that, if the new variety works, southern producers will switch to GM soy as well.

As it is profitable to switch production, many more producers abandon their traditional crops to plant GM soybeans. Cattle ranchers have also followed the trend. Beef price caps and export quotas made ranchers wonder whether to continue with Argentina's most emblematic activity, cattle grazing, or to free up land to grow soy. The drought of summer 2008 killed many animals and that expedited the decision. For those still undecided, federal credits to build feedlots gave them the further push. Nowadays the number of cows across the country is growing after it bottomed out in 2008. However, these are mostly feedlot-raised animals, which carry their own socio-ecological consequences: increased use of hormones and antibiotics, health issues related to feedlot-raised beef consumption, and degraded environmental quality, as feedlots pollute air, water, and soil (Schlosser 2002). Animal enclosure, typical in the US, was not common in Argentina until very recently although it is rapidly reaching all animals grown for human consumption, cows, chickens, and hogs, freeing land for agricultural use. Dairy farms have fallen under the same trend and regions specializing in dairy products, such as south of Córdoba province, now are only abandoned mills and water tanks, and rusty,
toppled fences, if they are not all together gone to make room for GM soy production. Similar stories of traditional activities, such as milking, cattle grazing, wheat growing, or horticulture, being replaced by large scale mechanized GM soy production crop up as one travels across the Argentine countryside. In consequence, there is now less available food for domestic consumption and it is of lesser quality (Teubal 2008).

In sum, the many policies taken to allegedly protect domestic food consumption have actually produced food insecurity. Argentina, historically the Granary of the World and still today a net-food exporter, has lost its food sovereignty, the ability to feed its own (Teubal 2008). Moreover all these changes have freed up land for soy, setting favorable conditions for the expansion of large-scale mechanized production. Small farmers and campesinos are at a huge disadvantage, as they do not receive any direct help in the form of subsidies, credit, or machinery. Many small and medium producers from the Pampas have unwillingly switched to soy, just because it is the only crop that gives enough profit to afford the next growing season. Because of economic hardship, some have been forced to rent or sell their plots and thus exit farming altogether. The fact that the government taxes producers of any size a flat export tax clearly benefits the bigger producers (a claim brought over and over since el conflicto del campo in 2008) as they have lower costs and higher profits.

As I further develop in chapters 4 and 5, the Kirchners' administration also promotes and encourages GM soy production by manufacturing quiescence in the face of negative consequences of production (Leguizamón 2011; Newell 2009a). Social spending in the form of conditional cash transfers, while important and necessary to relieve poverty, have a demobilizing effect (Piven and Cloward 1971). For example, in the
northern Chaco province, social funds started being distributed right at the time when people started to lose access to the forest as a means of subsistence. Thus, instead of fueling protest—as would be expected in comparison to similar cases in the Global South, where poor people have organized when in risk of losing access to their means of livelihood (Dwivedi 2001)—, government cash has substituted for the lost income, easing the strain. Moreover, in typical Peronista-style, welfare is often distributed in a clientelistic manner, thus further increasing demobilization and people’s dependence on the State (about Peronista-style clientelism, see Auyero 2001; for another example of demobilization and patronage in a northern province, Formosa, see Lapegna 2011).

Governments at town- and province-level also depend on federal soy-based revenue and thus become trapped in quiescence. After the 2008 conflicto del campo, Ms. Fernández signed a decree to create the Fondo Solidario de la Soja, the Solidary Soy Fund. The rural strike had placed soy production on every TV channel and almost overnight GM soy monocropping and its consequences became a public issue. The creation of the Solidary Soy Fund became a very concrete way to show the general population how they also benefited from soy production and exports (as well as a strategy to quell dissent). The Fund establishes the distribution of soy export taxes from the federal to the province and town governments (thus the Nation "co-participates" local governments in the soy-based revenue). For local governments, in particular small rural towns, soy-derived money is a very significant part of their budget (either as direct income as Fund co-participation or through the federal government, in the form of subsidies for social programs or social infrastructure investment). Hence, the local

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43 *Fondo Federal Solidario, Decreto 206/2009.*
governments are also tied to—or embedded in—GM soy production, as soy revenue is needed to pave dirt roads, bring clean water, build sewers, and to maintain or renovate the main plaza, schools, and hospitals; as well as to directly sustain a part of the population, by handing out monthly payments—as part of cash transfer programs—or new homes—as part of housing projects (programas de vivienda social). Consequently, it becomes very difficult for local governments to support or encourage alternative types of agricultural production, for it means risking a very significant percentage of their meager budgets as well as votes. The complicity of indebted local governments is therefore another important dimension of GM soy expansion in Argentina.

In sum, a specific political-economic and environmental context provided the perfect framework for adoption and expansion of the new GM biotechnology in Argentina. The result has been that the GM soy model has become a 'boom': continuous expansion of production, record harvests, and record profits from agro-exports have been a constant, harvest after harvest, year after year. However, with the expansion of the GM soy monocultures other issues have come to the front, in particular questions about the model's impact on socio-ecological dynamics. This is what I address in the next section.

3.3 SOCIO-ENVIRONMENTAL IMPACT OF GM SOY PRODUCTION

The introduction of the GM biotech package in a context of neoliberal restructuring has radically altered socio-environmental dynamics and social relations in Argentina and around the world (Otero 2008). The transition from a labor-intensive type of agricultural production towards one that is machine-, chemical-, and fossil fuel-dependent, has dramatically transformed rural life: Energy and petrochemicals displace labor and increase environmental degradation (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994). In the Argentine Pampas, there is a history of mechanization of the countryside and its consequent labor displacement that dates far back, to the mid-1940s. In his foundational work on Argentine rural life, American sociologist C. Taylor (1948) devotes an appendix on the "progress of mechanization in the Argentine countryside" and the whole tone of the book celebrates how "modern" and technified the Argentine countryside is, a type closer to the American farmer's model and far from the campesino of the rest of Latin America. In the 1970s, with the Green Revolution, Argentine farmers readily innovated and adopted the newly available agrarian technologies: hybrid seeds and agro-chemicals (Barsky and Gelman 2001). By the time GM seeds entered the Argentine seed market, rural displacement in the Pampas was already a well-established trend: rural population in 1970 accounted for 4.85 million people, or 20.2% of total population (a low number already, compared to 43.6% for the rest of the Latin American region).\(^\text{45}\) By 1980, the rural population had

lowered to 17.1% (4.81m) and, by 1995, accounted for only 12.6% of total population (4.37m people). Since the transition towards GM soy monocropping this trend has sped up, further reducing rural populations: in 2010, only 2.79 million people, 6.9% of total Argentine population, lived in the countryside.

This latest trend in rural depopulation can be largely attributed to the expansion of GM soy production. The technological package requires little labor, and as machines get bigger, they can cover more ground in less time (meaning less people employed to drive them). Due to environmental conditions only a limited amount of equipment, and therefore labor, is needed to accomplish agricultural tasks all throughout the country. Argentina spreads latitudinally in the southern hemisphere; harvesting season (which requires the most expensive machinery) takes place early in the year in the north and then gradually moves south. Tractors and combines travel down south doing the same work over and over, all across the country. Moreover, temperate weather conditions allow for 'windows' to perform tasks, say planting, spraying and harvesting. Thus again, allowing for the same machine to work on many adjacent fields before continuing their trip south.

*Rural contractors*, a type of rural actor that has grown in numbers with the GM agrarian transformation, are the ones hired to perform services, mostly pest control and harvesting (Lódola 2008). Contractors typically have no control over the land; they only own the machinery and do the labor. "Efficiency" thus results: as machines become more expensive, it is not "efficient" for producers to pay for them to only use them once and then have them parked the rest of the season. Contractors are "efficient" because they invest their capital in the machinery only, capital that is exploited to its maximum as it is at work almost all year round. Rural labor, thus, becomes specialized and concentrated.
As machines get bigger and more technologically advanced, specialized knowledge is necessary to operate them. Moreover, production planning happens in advance and it also requires specialized skills. Rural skills and knowledge, traditionally transmitted within the family or community, are now transmitted through universities. Agronomists and engineers with MAs in agribusiness now plan and follow production from afar, from the offices of the agribusinesses, with the help of communication and information technologies, such as computers, cellphones, and satellites. Visits to site–to the field–are seldom in order to gather necessary data, samples of soil and crops, which are analyzed back at the agribusiness' office. One person can overlook several thousand hectares. In an interview, an agronomist reported covering over 5,000 ha in a season when working for a large agribusiness, which he oversaw driving by himself from Santiago del Estero to central Buenos Aires.46

Therefore, as GM soy production replaces other agrarian activities that are more labor intensive, such as horticulture, milking, and cattle grazing and slaughtering, there are fewer available jobs for rural inhabitants. As a consequence, either because there are fewer rural jobs available or because rural work is not tied to the field anymore, many rural families migrate to the closest biggest town or city, where there are jobs and children are closer to schools and hospitals.

Rural depopulation goes hand in hand with a decrease in the number of farms as well as with increased farm size and concentration of landholdings (Gras 2009a; Gras and Hernández 2009a; Gras 2012; Teubal 2006). According to the 2008 rural national

46 Interview with agronomist (ingeniero agrónomo), former agribusiness employee (pool de siembra), Buenos Aires, March 2011. Most of the agronomists employed to do this job are young graduates (mostly men) under short contracts (the months that take the inspection tour).
census, in the Pampas region there has been a reduction of 24,405 farms between 2002 and 2008, an 18% decrease in farm numbers.\textsuperscript{47} Set in comparison with data from the 1988 rural census, the decrease is even steeper: a loss of 78,900 farms between 1988 and 2008, which is a plunge of 41.7% in just two decades. In the northern provinces there is a similar trend in the reduction of farm numbers, almost a 15% drop between 2002 and 2008 (a loss of 7,166 farms), and 20.6% in the two decade-period 1988-2008 (a loss of 10,657 farms).\textsuperscript{48} Farm size has also increased. Gras and Hernández (2009a:24) calculate that between 1988 and 2002 median farm size has increased by 25%, going up to 587 hectares.\textsuperscript{49} Larger farms ranging between 1,000-2,500ha have increased their relative weight by 8.5%. The largest farms, with 10,000ha or more, represent a small fraction of total farms (0.9%) but control almost 36% of landholdings (Gras and Hernández 2009a: 24). This trend of landholding concentration is the most significant and the hardest to assess with available data. Increasingly so, small landholders lease their farms to bigger producers, as it is now more profitable and less risky to rent out the land than engage in production themselves. The area operated under a rent-tenure system accounted for 52% in 2002 (Gras and Hernández 2009a: 24). That figure has kept increasing, and Gras (2012:12) estimates that currently 70% of all land under cultivation is leased.

\textsuperscript{48} Ibid.
\textsuperscript{49} Authors calculate from data from Rural National Census, \textit{Censo Nacional Agropecuario (CNA)} 1998 and 2002. Similar data from CNA 2008 has not yet been made available.
GM soy production in Argentina is mostly concentrated by agribusinesses (Gras and Hernández 2009a; Gras 2012; Newell 2009a; Teubal 2006; Teubal 2008; Teubal and Rodríguez 2002). Some agribusinesses operate with their own capital, including land ownership, but most pool capital from external investors and operate under short-term contracts. These types of agribusinesses are known in Argentina as *pools de siembra*, "sowing pools." *Pools de siembra* are investment groups that combine financial investors with a managerial core that rents land, labor, and machinery to produce at a large scale and often includes stock investment in the commodity market (Bustamante and Maldonado 2009). Some pools are small (i.e., control a few hundred hectares) but some have grown to control hundreds of thousands of hectares and have become powerful actors in the trend of technological innovation (Gras and Hernández 2009b; Gras 2012; Hernández 2007). *Los Grobo, El Tejar, and Adecoagro*, from magnate George Soros, are iconic examples of bigger pools. For example, a *pool de siembra* like Los Grobo controls 240,000 ha,\(^50\) most of it operated under lease (Gras, 2012:11). There are no official statistics that account for land leasing contracts, thus landholding concentration by the different pools is difficult to assess (Bustamante and Maldonado 2009). Relying on qualitative techniques and data from websites, Gras (2012:8) estimates that in Argentina 1.5 million ha. are controlled by the top 10 agribusinesses, and they are expanding production in neighboring countries of the South Cone. For example, *El Tejar* produces GM soy in Argentina, Brazil, Uruguay, and Bolivia.\(^51\) The technological package of GM RR soy has, in many ways, made possible the existence of these *sowing pools*, since in order to make the activity profitable it is necessary to produce over huge extensions of

\(^{50}\) [www.losgrobo.com.ar; accessed 1/6/12](http://www.losgrobo.com.ar)

land. The combination of no-tillage machinery and the GM RR seeds allows for the expansion of production. Also, the bigger the pool becomes, the more leverage they have to negotiate cheaper prices for inputs, thus allowing for increased profits, which then allows them to produce at an ever-increasing scale. The treadmill of production is thus at work, as the logic of profit requires increased production achieved through constant technological innovation (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994). In this way, Argentine agriculture resembles that of other large GM biotech adopters, such as the United States, as the number of farms and farmers shrinks, farm-scale increases, and they are largely controlled by agribusinesses (Magdoff, Foster, and Buttel 2000; Magdoff and Tokar 2010).

It is important to emphasize the significance of the loss of local control, as extra-local managers, consortia, contractors, and workers dominate production. Rootedness in place was the hallmark from agriculture from its very beginning. Yet, with increasing distance between those that work and control the land to the land itself, many conflicting issues arise, most crucially the ability to be removed from the negative consequences of production (see also Clapp 2014, Gould 2006, Leguizamón 2012). As I discuss in detail in chapters 4 and 5, this is a key to quiescence.

In this constant outgrowing of production, in the last few years the agricultural frontier has expanded outside of the Pampas region, into the northern provinces of Chaco, Santiago del Estero, and Salta (see Figure 1). Here is where the monocultures of GM soy have taken their heaviest toll (Pengue 2005). These northern provinces sustain a very different ecosystem than the Pampas: Here, *el monte*, the forest, is the predominant ecosystem, which is rapidly being torn down by bulldozing and fire to clear land for
mechanized large-scale production. The expansion of the agricultural frontier threatens highly sensitive biodiverse ecoregions, including the Yungas, the Great Chaco, and the Mesopotamian forest (Pengue 2005). It also threatens the livelihood of many northern rural inhabitants, who are mostly indigenous and peasant campesinos. With the expansion of GM soy production, land in the northern provinces has suddenly become very valuable. For example, a farm in Santiago del Estero that is suitable and ready for extensive agricultural production, in particular for GM soy cultivation, could be sold, in 2011, for US$7,000/ha, up from US$150-200/ha in 2001-2002.52

With this increased valorization of the land, historically absentee landowners are now back to claim the land with the goal of clearing the forest and renting or selling it for agricultural production. But to their surprise, at their return they find out that there are entire families living on what they claim is their property. It is not unlikely that these are the families of "forgotten" ex-workers, men who in the past had been employed as lumbermen but when the landowner fled and the job was over, the lumbermen remained there, and over time brought up their own families. These families claim the land as theirs based on the Ley Veinteañal, a law that concedes property rights to families that have lived on the same land for 20 years or more. Many families also claim land based on their ancestral origin, as native peoples, such as Wichís, Tobas, and Mocovíes.

*El monte*, the forest, is a vital resource to campesino and indigenous families: managed as a commons, the forest provides wood for coal for home cooking or sale and pasture for domestic animals, mostly goats. The forest also provides most of household income, from coal sale to direct employment. Men would typically find work as

52 Interview with licensed rural estate broker, Santiago del Estero, August 2011.
hacheros, loggers for timber sold to build furniture, posts for wiring fields to fence cattle, and rail foundations. As demand for wood falls, as wooden rail foundations are replaced by concrete and cattle are enclosed in feedlots, while at the same time profit margins for soy grow, switching from forestry to agriculture becomes the most enticing and jobs for loggers disappear at the pace of the dwindling forest. Nowadays, men and women are typically hired to gather the roots remaining after the forest has been bulldozed or burnt down, to prepare land for extensive industrial agriculture. This is an unsustainable and disheartening job, as it soon ends when there is no more forest to clear out, the very same forest that is their source of life.

In the land rush for soy, violence is escalating. Members of the Movimiento Campesino de Santiago del Estero (MOCASE), part of the international peasant movement Vía Campesina, denounce that campesino and indigenous families are under constant threat and assault, as paramilitary-like forces bulldoze their homes, threaten death to entire families, and murder their leaders.53 While violence against indigenous and peasant families for land control has a long history in these northern provinces—violence that prompts the emergence of the MOCASE as the strongest and most visible of campesino movements in Argentina—the expansion of GM soy in the North has certainly sped up the cycle of violence related to land grabs.54

El monte, the northern forest, is the largest forest ecosystem and the largest biomass reservoir in Argentina and the extra-tropical South America (Gasparri, Grau, and Manghi 2008). The clearing of the monte to make room for large-scale agro-export

53 Interview with members of Movimiento Campesino de Santiago del Estero-Vía Campesina (MOCASE-VC), Santiago del Estero, August 2011.
54 I further discuss the many forms violence takes in the North in chapter 5.
production, in particular GM soy, has prompted wide-scale deforestation at a very rapid rate (Gasparri, Grau, and Manghi 2008; Paolasso, Krapovickas, and Gasparri 2012; Pengue 2005). Deforestation in the northern provinces is a process that started long before the expansion of the agricultural frontier of GM soy, a fact brought up by defenders of the technology to ease criticism on the spread of the new technology (Trigo 2011). Authors agree, however, that the rate of deforestation has accelerated with the introduction of GM soy (Gasparri, Grau, and Manghi 2008; Grau, Gasparri, and Aide 2005; Paolasso, Krapovickas, and Gasparri 2012; Pengue 2005). A government report on deforestation in Argentina also points at the expansion of the monocultures of GM soy as the main accelerator of deforestation and forest degradation in the last decades, and claims that this is the strongest process of deforestation in Argentine history (USDEF, 2004:5). Between 1998 and 2008, 1,691,878 hectares of native forests have been lost in the northern provinces of Salta, Santiago del Estero, Chaco, and Jujuy (USDEF, 2008:10). Even despite the recently passed Ley de Bosques in 2007, the Forest Law that aims at containing the clearing of the native forest, deforestation continues, and at rapid pace (USDEF, 2008:10).

While forest clearing in the North is taking place right at this very moment, the Pampas have long been cleared out, long ago emptied out of local populations and its biodiversity. The clearing of the native landscape of the Pampas dates from far back, with the introduction of cattle by the Spanish during colonial times, and later expanding with the progressive transformation of the Pampas into the preferred site for agro-export

55 This report maps the process of deforestation in the Northern provinces. The map can be downloaded at http://www.ambiente.gov.ar/archivos/web/UMSEF/File/Mapas/deforestacion07-08_ley26331_130x90.jpg
production (Matteucci 2000). These transformations happened so long ago there are no clear records on how the Pampas originally looked like (Matteucci 2000). Yet, compared to the current GM-soy model, the historical model of agro-export production implied a sustainable use of the land: a livestock-agriculture rotation allowed the soil to rest and recover some of its nutrients and properties (Matteucci 2000). On the contrary, the monocultures of GM soy have implied an exacerbation of the negative ecological impacts of agro-industrial production in this region (Matteucci 2000; Pengue 2009).

The environmental impact of large scale GM soy monocropping is being felt all throughout the country, in the North as in the Pampas. As monocrops expand natural habitats disappear, thus endangering plant and animal biodiversity (Martinez-Ghersa 2011; Pengue 2005; Pengue 2009). Large scale mechanized GM soy monocropping in the Pampas has also resulted in nutrient depletion (phosphorus and nitrogen), soil erosion, and soil structure degradation (Martinez-Ghersa 2011; Pengue 2005; Pengue 2009).

Agro-chemical spraying, necessary to artificially control pests and weeds that grow under monocultures, is another important source of socio-ecological disruption. Proponents of the GM biotechnology highlight the environmental benefits related to no-tillage (Trigo et al. 2002). As described in the previous section, at the time of adoption of GM biotechnology, a reduction in the number of agrochemicals used was an important piece in the decision of adoption. However, over time, pest resistance and soil depletion have demanded increasing doses of agrochemicals (Binimelis, Pengue, and Monterroso 2009; Martinez-Ghersa 2011). The emergence of glyphosate-resistant weeds, like johnsongrass, has been met with the introduction of novel varieties of GM crops that tolerate increasing doses of herbicide, thus intensifying both agrochemical use as well as
GM crop adoption, a phenomenon that Binimelis et al. (2009) conceptualize as a "transgenic treadmill."

With the emergence of glyphosate-resistant "superweeds," producers have resorted to increasingly higher doses and more toxic formulations, including some with globally banned agro-chemicals, such as atrazine, endosulfan, and 2,4-D (Binimelis, Pengue, and Monterroso 2009; Pengue 2005). In labs, studies have shown that in vertebrate embryos glyphosate and Roundup formulations are endocrine disruptors, meaning that they interfere with normal hormone and enzyme functioning, impeding normal development and causing malformations (Paganelli et al. 2010). A report by Argentine physicians links increasing cases of cancer, miscarriages, and birth defects in towns nearby fields sprayed with agro-chemicals, glyphosate in particular (1er. Encuentro Nacional de Médicos de Pueblos Fumigados 2010). Similar findings are presented in a report commissioned by the provincial government of Chaco (Comisión Provincial de Investigación de Contaminantes del Agua April 2010).

As fields increase in size, glyphosate spraying is often performed with airplanes, which makes fumigations less controllable. In interviews, rural inhabitants denounce being sprayed over their heads and homes, over their schools and hospitals. In response, some community organizing has taken place in the form of citizen and neighbor assemblies in several towns across the country to protest against agro-toxics—as they term agro-chemicals—, and to demand stringent regulations for agrochemical use (Berger and Ortega 2010; GRR, Grupo de Reflexión Rural 2009). It is worth noting that protest and mobilization in response to the effects of glyphosate has also been contained by violent means, as assembly meetings are violently disrupted and people are intimidated from
attending. As I further argue in chapters 5 and 6, the health impacts of agrochemical spraying are now the most contested aspect around GM soy production in Argentina.

In sum, the GM soy-based agrarian transformation has implied radical changes in socio-ecological dynamics in Argentina: increased inequality due to concentration of landholdings and agribusinesses, rural displacement through a violent politics of dispossession, and health hazards due to agrochemical exposure add to the disruptions at the ecosystem level, including deforestation, loss of biodiversity, emergence of glyphosate-resistant superweeds, nutrient depletion, and air pollution. As such, why is it that in the face of this massive agrarian transformation Argentines do not react and protest? Why are they quiescent? Some reasons have already been introduced in here, I develop them further in the following chapters.

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56 One of the most notorious of these violent events was the "interrupted" visit of Andrés Carrasco—a scientist that has tested the health effects of Roundup fumigations and one of the leading anti-glyphosate/GM soy-voices in Argentina—to La Leonesa, Chaco, in August 7, 2010. Carrasco had been invited by the neighbor assembly to discuss the environmental and health effects of glyphosate spraying, in a town that had organized to protest against fumigations in adjacent rice fields. Right before the meeting, Carrasco and his colleagues were violently attacked by a group of people identified as public (town hall) employees and employees from the rice firm (Aranda, Darío, "Censura y Presiones," Página/12, August 17, 2010).
CHAPTER 4. QUIESCENCE

We do the best agriculture in the world.
Leo, agronomist, rural teacher, zona núcleo.

It's a hot and sunny day of summer in December 2009. We're in the field, Leo and I, standing right in the zona núcleo, the heart of Argentina's soy production. It's my first interview on the ground, the day I officially meet the queen of the story: the little soy plant. Leo is an agronomist employed as a teacher at the local agro-technical high school, in a small rural town in the northeast of Buenos Aires province. Those days, he's also my main informant and, unofficially, my Agronomy 101 teacher. Where we are standing, at the crossroads of four lots, we are surrounded: soy grows in all four farms. I cannot tell because the plants haven't grown enough yet, it's only a couple weeks past the planting season. Leo shows me how to tell it is soy from the incipient sprouts and the work of the no-tilling machine. Right there, –the naive eagerness of the novice–, I am open about my research question: I openly question GMOs and the expansion of GM soy monocultures, and ask why quiescence, why is there no mobilization in the face of such a massive agrarian transformation. In reply I get a puzzled glance and a candid answer: "Why for? We do the best agriculture in the world!" From here on, this would be the most common theme that will come up in my fieldwork.

As I continued with my fieldwork I learnt, first of all, to keep my research question for myself, and second, that the issue was more widespread and profound than what I expected: not only is there nothing wrong with GM, it is the best thing to do. Leo's positive approach towards the GM based agro-industry in Argentina is the shared
perspective among rural soy producers and their employees. The results are at glance. Back in the field in February 2011, when soy plants have a fair size to be distinguished from other crops, soy is all there is to see. Travelling across the *zona núcleo* of Buenos Aires, Córdoba, and Santa Fe, covering several hundred miles on main highways and side dirt roads from the top of bus decks, Ford trucks, passenger cars, and grain cargo trucks, out of the window soy is all I see: homogenous rows of the bright green plant, about eight inches tall, thin stems, round leaves. It is a sea of soy. It feels as if GM soybeans have taken over the Argentine countryside.

This expansion of GM soy in Argentina is celebrated as a boom. As I show in this chapter, GM based agriculture is framed almost solely in terms of benefits. Yes, there are grievances and some contestation emerging, as I show in detail in the following chapter, in particular coming from indigenous and campesino movements in the North of the country and by citizens' assemblies organizing around the health impact of glyphosate spraying. For soy producers however, grievances do not come up in relation to GM or to soy expansion but, most on the contrary, on the obstacles that limit soy production and technological innovation: the Kirchners administrations' interventionist policies in particular. This celebratory approach towards GM stands in radical contrast to the experience of other countries of the Global South, where, as described in chapter 2, the introduction of GM has been vehemently challenged and opposed. The aim of this chapter is to address this issue.
4.1. POWER & (BIO)HEGEMONY

As introduced in chapter 2, technological change is not random or self-reproducing, neither objective nor neutral, but rather it has a social basis (Gould 2009; Schnaiberg 1980; Schnaiberg and Gould 1994). The aim of this chapter is to look at the power relations that form the social basis for technological change in relation to GM biotech adoption and expansion in Argentina and analyze how these relate to the causes of consensus and conflict. In order to identify which actors and institutions are in power to guide technological change, we should find out (1) Who has control over natural resources/agricultural production in Argentina? and (2) Who reaps the benefits of this agrarian transformation? (Schnaiberg 1980). In this case, the main institutions of appropriation are the state and large agribusinesses (national and transnational). These powerful institutions have worked in conjunction, in an alliance of interests, to secure hegemonic support for the GM soy model as a key accumulation strategy (Newell 2009a). Newell (2009a) conceptualizes this as "bio-hegemony."

Bio-hegemony, in Newell’s words, refers to

the alignment of material, institutional and discursive power in a way which sustains a coalition of forces which benefit from the prevailing model of agricultural development. (....) This requires the successful projection of particular interests as general interests such that the benefits and value of agricultural biotechnology acquire the status of common sense and go largely unquestioned. (Newell 2009a:38)

It is important to emphasize that this is a coalition of forces, an alliance between corporations and the state. More specifically, bio-hegemony "has been produced and sustained by an alliance of interests which includes powerful agribusiness producers and traders (such as Cargill), export-oriented elements of national Argentine capital (such as Bio Sidus, Relmo, and Don Mario), multinational biotechnology firms (such as Syngenta,
Dow, and Monsanto), large commercial banks, and supportive elements within the Argentine state itself.” (Newell 2009a:35).

The focus of Newell’s piece is on the role of agribusiness in sustaining bio-hegemony in Argentina. Hence, he investigates corporate strategies to produce and sustain ‘bio-hegemony’, i.e., to secure power over the desirability of an agro-export model based on GM soy production in Argentina (Newell 2009a). In this dissertation I build on Newell’s work to consider the role of the state in producing and sustaining ‘bio-hegemony.’ I thus expand on Newell's conclusions by providing further evidence that it is this alliance of powerful actors and institutions –an alliance of economic and political power– that creates quiescence and consent: It is the alliance which gives the GM model its strength and makes quiescence so thick. As I show later, it was in the momentary break of this alliance, during the *Conflicto del Campo* in March 2008, when challenges to this model emerged. While this break was only temporary (and in a way superficial, only at the level of discourse, as the government continued to provide material and institutional support), it opened a window of opportunity for contestation to emerge (McAdam 1982).

Therefore, this chapter builds on the previous ones as I further show how powerful organizations and institutions support and promote GM biotechnology as a key element for Argentina’s model of socio-economic development. In particular, in this chapter I look at how quiescence implies consent: a fervent support for GM biotech by those in control of agricultural production and a mild, yet still effective, support by rural inhabitants. In here I thus show how GM biotechnology is framed solely in terms of benefits and how this framing becomes the hegemonic discourse of the GM soy model. In
theoretical terms, in this chapter I explore the links between framing and power. The goal of this chapter is thus to show how the third dimension of power is at work to create quiescence and consent (Lukes 2005).

But before I turn to the framings of GM biotech, I will discuss some mechanisms and strategies employed by the corporate-state alliance to promote the GM soy model in Argentina, the recipe for a swift adoption of GMOs.

**Mechanisms and Strategies of Power: A Recipe for Swift Adoption**

Back in 1996, without much controversy, GMOs were approved for commercial use in Argentina; an outstanding fact, considering that to this day, over 15 years later, less than 30 countries in the world have approved the technology (James 2012). Even in Brazil and Paraguay, now two large GM soy producers, it took many years for GM biotechnology legislation to be passed, embroiled in a long legal battle and strong public resistance (and after the fact that non-GM soy was contaminated by Argentine GM soybeans smuggled through the border)\(^{57}\). For many reasons, some already described in

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\(^{57}\) For years, and despite the legal moratorium to plant GM seeds in Brazil, GM soybeans were contrabanded from Argentina through Paraguay into Brazil (Jepson, Brannstrom, and Stancato de Souza 2008, Newell 2009b). While the traffic of seeds was illegal, it was a common and widely recognized practice; these smuggled soy seeds are popularly known as *soja Maradona*, named after the famous Argentine soccer player. By 2003, and again, despite the moratorium, Maradona soybeans accounted for between 70 to 95% of all soy production in Rio Grande do Sul, Brazilian southern state and frontier with Argentina, also the territory of the MST (Jepson, Brannstrom, and Stancato de Souza 2008:219). The unavailability of non-GM seeds resulted in the *de facto* approval of GM soybeans, as farmers could not chose otherwise but to plant GM seeds, despite their preference for non-GM (personal communication with Vicente Marques, Federal Agrarian Expert at the Brazilian National Institute of Agrarian Colonization and Reform (INCRA), 11/16/09). That the biotechnology firms did not intervene to stop this illegal flow of seeds can be understood as a useful—and successful—market strategy to enter the Brazilian and Paraguayan markets (Newell 2009b:266).
previous chapters, Argentina was the perfect port of entry of GMOs in South America. Among those, it is important to emphasize the neoliberal/globalization context and program, Argentina's history of mechanization of the countryside, its agro-export past, and, as I show in this chapter, a cultural preparation, a mindset ready to receive GMOs with open arms. In this context, powerful actors and institutions used various mechanisms to promote and support a model of socio-economic development based on GM soy for export, as well as to suppress public participation that could represent a challenge to the model.

In order to understand the swift adoption of GM biotech in Argentina it is important to emphasize that there was a context that was amenable for GM to thrive: As described in chapter 3, during the neoliberal 1990s, an institutional and regulatory framework was set in place to promote GMOs as a technological means to increase agricultural production –the NTAEs model. How GM seeds were approved for production and commercial use in Argentina is a rather controversial and murky business (Verbitsky 2009). Monsanto’s RR soy was approved in the summer of 1996 in record time, less than three months after the application was presented for approval. In this application, the safety, quality, and efficacy of GM biotechnology is justified based solely on Monsanto’s tests and reports; reports that in the rush of presentation were not even translated into Spanish (Verbitsky 2009). Verbitsky (2009) claims that at this time members of the Argentine Institute of Plant Health and Quality –Iascav, Instituto Argentino de Sanidad y Calidad Vegetal–, questioned RR soy approval on the basis of health and environmental concerns and requested further testing before approval. None of these requests were heard, and on March 25, 1996, Felipe Solá, the then head of the
Secretary of Agriculture, Fisheries, and Food (Secretaría de Agricultura, Pesca y Alimentación) signed the resolution number 167 that approves glyphosate tolerant GM soybeans and derivatives for production and commercial use in Argentina. At this time, Mr. Solá did not even have the legal right to sign this resolution; this permission would come three days later (Verbitsky 2009).

The relationship between Monsanto and the Argentine government has been close (Newell 2009a). At the time of RR seeds approval, Monsanto’s report on the “Safety, Compositional, and Nutritional Aspects of Glyphosate-tolerant Soybeans” was the only test and proof for the safety of GM seeds (Verbitsky 2009). The resolution that approved GM in Argentina was based on a mirror policy to the US – that of ’substantial equivalence‘, instead of the precautionary principle used in the EU\textsuperscript{58} (see Kloppenburg 2005). Direct involvement in reviewing and designing commercial applications and biotech related policy, corporate lobbying, and even the exchange of personnel (the 'revolving door' of business and politics) are a reality in Argentina (as in the US) and show the close connections between corporations and the state, as well as the pressure large transnational corporations can exert over governments (Newell 2009a).

On other issues, however, the relation between Monsanto and the Argentine government has been tight, in particular in relation to property rights (Newell 2009a). GM seeds, patented and owned by corporations, are typically a matter of contention for farmers (Shiva 2000). Patented seeds are expensive and, under contract, cannot be saved for the next growing season, as it is tradition in agriculture. Argentine farmers, however, are protected under UPOV 78 (1978 Convention of the Union for the Protection of New

\textsuperscript{58} Which was, in the US, the result of significant corporate lobbying (see Kloppenburg 2005).
Varieties of Plants) so farmers can legitimately plant their own saved seeds\(^{59}\) (Chudnovsky 2006; Pengue 2005; Qaim 2005). Moreover, Argentine farmers who plant RR seeds are not compelled to sign a contract with Monsanto, as it is customary in other countries, such as the United States (Pieri and Abramovsky 2009; Qaim and Traxler 2005). There is also a black market for GM soybean seeds, generally bought in unlabeled white sacks, which farmers refer to as *bolsa blanca* (Chudnovsky 2006; Pengue 2005; Qaim and Traxler 2005). It is estimated that only 25% of seeds planted are "certified" (where a small technology fee is paid); the remaining are either saved seeds or seeds bought in unlabeled *bolsa blanca*.\(^{60}\) The lack of patent contracts is key to understand farmers' high levels of acceptance of the new technology and low levels of initial resistance in Argentina in contrast to other nations of the Global South.

For Monsanto, the significant loss from technology fees for patented RR soybeans is, as might be expected, a source of dispute between the agribusiness and the Argentine government (Newell 2009a). It is important to note however, that Monsanto starts the battle over this issue only after 2001, when RR soy was well established in Argentina and, thanks to Argentine farmers, also in neighbor countries Brazil, Paraguay, and Bolivia, where Argentine RR soy was smuggled through the borders despite GM crops

\(^{59}\) Glyphosate-tolerant soybeans were first released commercially in Argentina under license of the multinational agribusiness Nidera (which had access to Monsanto's RR gene through the acquisition of Asgrow Argentina). At this time, Nidera did not apply for patent-rights for RR soy because Monsanto, not Nidera, had developed the RR gene. By the time Monsanto sought to revalidate the patent, the petition was rejected on the grounds that the RR-tolerant plants were not a new variety, they were already widespread in Argentine soil. This is protected under UPOV 78 (for more details, see Chudnovsky, 2006, Qaim and Traxler, 2005).

\(^{60}\) "Monsanto ya se aseguró el cobro de las regalías por su nueva súper soja," Clarín, August 22, 2012.
being illegal in these countries. Critics argue that 'keeping quiet' during this initial period was a good strategy for Monsanto to enter the South American market—a market otherwise closed to GMOs (Newell 2009b; Pierri and Abramovsky 2009; Teubal 2006).

The situation on property rights in Argentina is currently under debate, and likely to change very soon, so that farmers may have to start paying for patented seeds and forfeit their right to uso propio, their right protected under UPOV 78 to save seeds. Monsanto’s newest GM soy variety \textit{Intacta}^{TM} \textit{RR2}^{TM} \textit{Pro} (a stacked trait Bt-RR) was approved for commercial use in Argentina in August 2012 and it is expected for release in the next growing season 2013/2014. This announcement was made jointly by the heads of Monsanto Argentina and of the Argentine Ministry of Agriculture, Minister Norberto Yahuar, Secretary Lorenzo Basso, and Sub-Secretary Oscar Solís. Monsanto had been holding back the new RR2 variety from the Argentine market because of the patent issue. Lately, however, negotiations between Monsanto and the Argentine government have sped up, culminating in the presentation of Intacta RR2 soybeans last August, where Mr. Yahuar, the Minister of Agriculture, announced the imminent passing of a new Seed Law that addresses Monsanto's demands. To this day this law has not been passed; yet it is important to highlight what is at stake: If RR2 soybeans are released

\footnote{63 See footnote #57.}
\footnote{62 "La Secretaría de Agricultura autorizó el uso comercial de la soja con tecnología INTACTA RR2 PRO de Monsanto en Argentina", News and Opinions, Monsanto Argentina, August 16, 2012. Available at http://www.monsanto.com/global/ar/noticias-y-opiniones/Pages/20120816.aspx}
\footnote{64 "Soja: Monsanto presentó Intacta RR2 junto al ministro nacional", \textit{La Voz del Interior}, August 21, 2012; "Monsanto ya se aseguró el cobro de las regalías por su nueva súper soja," \textit{Clarín}, August 22, 2012; "Monsanto negociará el pago de regalías para la nueva soja," \textit{La Nación}, September 1, 2012.}
on Monsanto's terms, (terms that have the explicit support of the Argentine government, as exemplified by the presence and words of high representatives of the Argentine Ministry of Agriculture in the presentation of the new GM variety), this will mean drastic changes in seed use and commercialization in Argentina. Monsanto has already struck private agreements with some Argentine soy producers, who have agreed to pay a royalty fee for the new GM seeds (and if they don't, and if crops tested at the time of sale are shown to contain the patented gene, farmers will have to pay royalties at a higher price – meaning, royalties plus a fine). 65

Most important it is that at this meeting the Minister of Agriculture promised changes to the Seed Law, which will end farmers’ right to save seeds. This shows, as with the passing of 1996 GM regulation, a corporate-state alliance working for a legislation that promotes GM biotechnology (and protects corporate rights over farmers' rights). A new Seed Law is thus welcomed by members of agribusinesses and organizations that will benefit directly from this development, the seed industry (Monsanto, Syngenta, Dow; seed sellers like Don Mario and Nidera) and groups and associations that promote new agrarian technologies, such as the Asociación de Semilleros Argentinos (ASA) and the Asociación Argentina de Productores en Siembra Directa (AAPRESID). 66 On the other side, the Seed Law is highly controversial among members of rural organizations like the Argentine Agrarian Federation, Federación Agraria Argentina (FAA) that represents small and mid-sized farmers. To the proposed Seed Law, the FAA specifically rejects the end of uso propio, farmers' right to save seed

for replanting.\textsuperscript{67} This shows the extent of consensus over GM biotechnology across rural sectors, from large to small agrarian producers: Contestation is over access to the technology (concern arises because they won't be able to afford it) and not about the technology itself.\textsuperscript{68} This stands directly opposite to concerns raised by the National Movement of Indigenous Peasants, \textit{Movimiento Nacional Campesino Indígena} (MNCI), which rejects the Seed Law on the grounds that the right to save seed represents peoples' right to food sovereignty and autonomy and to protect biodiversity.\textsuperscript{69} This is a common claim raised by anti-GM peasant movements in the Global South, who reject the technology itself, and not access to it, on the basis that that protecting the seed represents protecting life (Shiva 2000).\textsuperscript{70}

The use of discursive means to present GM biotechnology as a positive and necessary development is a key strategy to create consensus over the new agrarian technologies (Gramsci 1972; Lukes 2005; Newell 2009a). In his speech at Monsanto's Intacta RR2 event, the Minister of Agriculture praised GM biotech, arguing that these new technologies will benefit Argentina and the world, celebrating GM biotech as key to increase food security in an increasingly challenging world, struck by climate change, droughts, energy scarcity, and a growing population.\textsuperscript{71} These words seem to be taken

\textsuperscript{67} Op. cit.
\textsuperscript{68} Op. cit.
\textsuperscript{70} It is true though that smallholder farmers throughout the Global South have adopted GM biotechnology, but it seems to be the case that for many it is out of lack of choice and not due to preference. For example, as it happens with MST peasants in Brazil (see footnote #57). Another example are the Makhathini cotton farmers in South Africa, for whom cotton is the only crop that has a market (Schnurr 2012).
\textsuperscript{71} "Norberto Yauhar en lanzamiento de nueva tecnología en soja Intacta RR2 de Monsanto" -Speech by the Minister of Agriculture, Norberto Yauhar, August 22, 2012.
squarely from Monsanto's corporate brochure\textsuperscript{72} and show the alignment of the pro-GM corporate-state discourse. The media resonated in the celebratory mood: Monsanto's RR2 is not just soy but the new \textit{súper soja}, "super soy," the crop "of the future."\textsuperscript{73}

PR and the media are the most effective and widely used corporate strategies to create consent (Beder 2002; Stauber and Rampton 1995). What is said to the public and, just as important, what is hidden from public opinion, serves the purpose of promoting a particular opinion among civil society; it serves the purpose of influencing the public and of building hegemony, the second and third dimensions of power (Lukes 2005). In Argentina, the agribusiness sector has close links to the media, which also shows high levels of corporate concentration. \textit{Grupo Clarín} is at the lead, the largest media conglomerate in Argentina and one of the largest in the Spanish-speaking world.\textsuperscript{74} Established in 1999, the activities of \textit{Grupo Clarín} stretch over print news (most important, of \textit{Diario Clarín}, the newspaper with the highest circulation in Argentina), Internet access and cable TV, and radio and television sectors. \textit{Grupo Clarín} owns one of the two leading broadcast television channels in Argentina, \textit{ARTEAR/Canal Trece}, as well as the country's leading all-news channel, \textit{Todo Noticias}, popularly known as \textit{TN}.\textsuperscript{75} Usual sponsors of TV shows on \textit{TN} news channel are Monsanto, Dow AgroSciences,

\begin{itemize}
\item Available at http://www.minagri.gob.ar/site/institucional/prensa/index.php?edit_accion=noticia&id_info=120822171448
\item "Monsanto ya se aseguró el cobro de las regalías por su nueva súper soja," \textit{Clarín}, August 22, 2012; "La soja del futuro ya está en el país," \textit{La Nación}, March 30, 2013.
\item Wikipedia. http://es.wikipedia.org/wiki/Grupo_Clarín#cite_ref-1
\end{itemize}
seed sellers like Nidera, and organizations that represent agro-export-related interests, like CIARA, Cámara de la Industria Aceitera de la República Argentina.

*Clarín*, together with *La Nación*, the newspaper with the second highest circulation in Argentina, organize *Expoagro*, one the most important and largest annual agricultural fairs in the country. As described in Expoagro's website: "the latest developments, innovations and tendencies for agricultural machinery and productive systems can be seen at Expoagro."76 This is one of the main hubs for dissemination of new agricultural technologies and practices in Argentina: among its exhibitors are the leading research companies for biotechnology and agro-chemistry along with financial institutions, insurance companies, communication groups, commercial and industrial chambers, and academic institutions.77 During the year, all across the country, smaller versions of Expoagro take place around the country. Groups like AACREA (*Asociación Argentina de Consorcios Regionales de Experimentación Agrícola*) and AAPRESID (*Asociación Argentina de Productores en Siembra Directa*) are at the lead in organizing these espacios de capacitación, training and learning environments, as producers describe them, spaces in which to learn and share experiences about new agrarian technologies and methods. These meetings have the support of pro-GM NGOs and think tanks, like Argenbio, as well as government-funded research institutions, like INTA (Instituto Nacional de Tecnología Agropecuaria). These institutions cooperate to create and promote what producers refer to as the "new paradigm," or "the agribusiness paradigm" of agriculture: agricultural production aimed to increase profitability through constant technological innovation. The concept of Knowledge (a mix of managerial capabilities

and latest science & technology) is what is at the core of this paradigm. This new paradigm expands across the countryside in all these meetings and in the rooms of public (government-funded) universities, where Agronegocios, Agribusinesses, is now part of the curriculum and the Masters degrees at national public universities. Outreach efforts include INTA extensionistas handing out GM seeds to farmers.

The role of the media in creating consent is most important (Gramsci 1972; Herman and Chomsky 2002; Lukes 2005). Clarín and La Nación, the two most widely read newspapers in Argentina, have been strategic actors in the creation and dissemination of the new paradigm and thus, of creating support for the GM soy model (Newell 2009a). In these newspapers, Argentina's transition to GM soy is depicted as a well-rounded success, described in terms of continuous expansion of production, record harvests, and record profits.  

Héctor Huergo, main columnist in Clarín newspaper and director and main editor of Clarín Rural, the rural magazine of the newspaper, is recognized as one of the main mentors and promoters of the GM based agro-industrial model in Argentina.  

From his regular op-ed at Diario Clarín, Huergo praises GM biotechnology and the model’s success, extolling "Only biotechnology can save the world" or "Soy, 21st century manna."  

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79 See for example, Jorge Rulli, head of GRR Grupo de Reflexión Rural http://www.pararelmundo.com/noticias/la-presidenta-quiere-fumigar/

The media has taken as well to promote a campaign on soy as a miracle food. This started during the 2001 crisis. Then, for the first time in Argentine history, hunger became an issue. Hungry kids with watery eyes and overblown bellies, pictured barefoot in dusty roads, filled daily news with polemic headlines: “Is this Somalia?” Argentines were struck and outraged to learn about the existence of hunger in the midst of an agrarian country, or was not Argentina the Breadbasket of the World? And while the expansion of the monocultures of GM soy are directly to blame for Argentina’s loss of food sovereignty (Teubal 2008), in the news soybeans were being described as porotos maravillosos, marvelous beans that will solve the problem of hunger.\(^\text{81}\) Soy-related news sprouted, portraying this crop as the best replacement for meat consumption because of its high protein value and cheaper price (important benefits in a context of high poverty). Soy-based recipes and advertisements of free cooking workshops aimed at training Argentines on how to include soy and soy-based products into their diets appeared often in the news.\(^\text{82}\) Cultural values enter into a contradiction here, and are potentially a source of conflict: Beef is a main staple of Argentine diet and culture, and Argentines pride themselves of having the best beef in the world. There is still an ongoing campaign to extoll the benefits of soy over meat consumption. These arguments usually rely on ‘scientific evidence’ that allegedly prove the health-related benefits of soy consumption (vs. eating meat).\(^\text{83}\)

Just as important as analyzing how the powerful portray GM biotech is to question what is hidden from public view, what is not in the media agenda. Certainly

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\(^\text{81}\) “La soja es un arma cargada de futuro,” Clarín, February 2, 2002.

\(^\text{82}\) “A falta de carne barata, buena resulta ser la soja,” Clarín, April 22, 2002.

\(^\text{83}\) “Confirman que la soja reduce el colesterol y protege el corazón,” La Nación, November 19, 2007.
only a limited number of events can make it to the news; it is technically and logically impossible to describe everything that happens all the time everywhere. Which events become 'news' is decided by those that control information channels (see Herman and Chomsky 2002; McChesney 2000; Schiller 1973; Stauber and Rampton 1995). Taking controversial, or potentially controversial, events out of public view serves the purpose of suppressing public participation (because, as introduced in Chapter 2, who would mobilize without a grievance?). In Argentina, negative consequences of GM soy monocultures and other topics that could be considered anti-GM are conspicuously absent from the media. And this applies to both corporate and state media channels: As one activist told me: No aparece ni en 6,7,8 ni en TN, there is no discussion over these issues neither in 6,7,8, the propaganda TV news show of the Kirchners’ administration, neither in TN, Grupo Clarin’s corporate news channel. It goes to show that despite the embittered legal and discursive battle the Kirchners’ administrations and Grupo Clarín are embroiled in, both corporations and the state share in the construction of a discourse that promotes GM soy as a key accumulation strategy (Newell 2009a).

The most visible consequence of the invisibility of GM soy expansion as a social problem is quiescence. Over 90 per cent of Argentine population is urban, their main source of information about the countryside is what they read in the papers or watch on TV. To them, food grows in supermarkets. In Argentina, GM foods are not labeled and the debate over the health consequences of eating GMOs is circumscribed to small circles.

(some academics, activists). Soy, despite the news campaign to make it 'food', is yet not a staple in Argentine meals. Still, just as in the US, most people don't know that they eat GMOs when drinking soda or feeding formula to their children. Most Argentines don't know that the soy being grown in their country is transgenic, and if they do know, they have very little knowledge of what transgenic or GM means. Early on in my research, when describing my research topic to my city-based friends and family, I would often receive puzzled glances and high pitched replies: "What?!! Transgenic?!? REALLY!?!?!!" To which, to my positive reply, would follow a resigned "And so... What's that then?" However, as I describe later in this chapter, after the Conflicto del Campo, the agrarian revolt over export taxes in March 2008, GM soy suddenly entered public consciousness: GM soy production was then all over the media, in a struggle between those that portrayed the social and environmental degradation of GM soy monocultures vs. the hegemonic success discourse of the soy boom. This became a window of opportunity and now the number of people I encounter that are aware of this issue is much larger than in the beginning of my research. Yet awareness is not as sizable as on other related topics on natural resource extraction, which have been much more widely portrayed in the media: mining in particular. Among activists, a common plight on soy and agribusinesses is that "most people don't know" (which again can be followed by a "they don't want them to know.")

Beyond the media, another very effective strategy to suppress public participation is outright violence, the first dimension of power (Lukes 2005). From assembly meetings
on anti-fumigation being disrupted and participants being intimidated\textsuperscript{86} to campesino-leaders being murdered,\textsuperscript{87} the cycle of violence to silence contestation speeds up with the expansion of GM soy. I discuss this aspect of power in the following chapter. In what follows, I give further details and examples on strategies and mechanisms of the second and third dimensions of power, in particular in relation to the framing of GM biotechnology by rural producers and inhabitants.

4.2 BENEFITS OF THE TECHNOLOGY #1: PROFITS

The main explanation for quiescence around GMOs is consensus over the economic benefits of technological innovation and the GM soy agro-export model. Political and economic power, the state and corporate agribusinesses, share in the material gains of this model (see Chapter 3, Newell 2009a). Therefore, there is quiescence because the powerful profit from it. Indirectly, as I show later, the powerless benefit as well. In the field, the main reason I got overall, across all rural sectors/actors, to the question on what basis is production organized, was rentabilidad, profitability.

Growing soy is good business. As Coronil (1997) would argue, there is a material reality that can't be escaped. It is profitable for farmers to produce soy, more profitable (and less risky) than growing any other crop. It is also profitable for the state and the agribusinesses. In the last chapter I showed with figures how profitable soy production is, for farmers, agribusiness, and the state. The aim of this chapter is to analyze this positive framing of GM biotech in terms of profitability.

\textsuperscript{86} Interview with members of Asamblea Ambiental "Basta de Fumigarnos", La Leonesa, Chaco, August 2011.

\textsuperscript{87} Interview with members of Movimiento Campesino de Santiago del Estero-Vía Campesina (MOCASE-VC), Santiago del Estero, August 2011.
Growing Greens: Nature as a Source for Profit

In Argentina, GM has not been constructed as a grievance because benefits appear to outweigh negative consequences. The main benefit singled out by interviewees is economic profit. It is in these terms that rural producers in the Argentine Pampas organize production and the adoption of new agrarian technologies: mayor rendimiento, mayor eficiencia y productividad, reducción de costos, to increase yields, efficiency and productivity, and to reduce costs. The main goal is to increase output and reduce costs and time in order to increase profits. Technological innovation is a means to an end: the end being to increase profits. Germán, a medium sized (650 ha) farmer in the southeast of Buenos Aires province, summarizes this mentality.88

A: Then, the decision over the adoption of new technology is based on...
G: (interrupts) On a cost-benefit issue.
A: There is always this approach…
G: Yes. It's like... It's the raison d'être of the entrepreneur (empresario). That the company (empresa) is sustainable, economic... Sustainability means that it endures over time but also that it makes money (que perdure en el tiempo pero también que gane plata).

This commentary exemplifies the most common pattern I've encountered in my fieldwork: The parameter for decision, on what crops are grown and what technologies are incorporated, is entrepreneurial, business-like, profit-oriented. This parameter is openly discussed in interviews with a sense of pride, by interviewees that either profit or receive a wage income from agricultural production (rural workers/employees). Germán's commentary above thus summarizes a shared framing on agricultural production that has two components: (1) El campo es una empresa: El campo becomes a concept that encompasses much more than the countryside, the farm, or the plot of land, it is the

88 Interview, Buenos Aires, July 2011.
producing activity, an enterprise, a business, a company, a firm; and (2) the person responsible for *el campo* is not a farmer but a producer, *productor,* and an *empresario,* an entrepreneur. These changes in mentality/framings of agriculture are linked to profound changes in the organization of agrarian production and the rural social structure of Argentina, changes already described in Chapter 3, characterized by the transformation of rural actors (the emergence of *productores-empresarios,* *pools de siembra*/sowing pools, and contractors) and the displacement of rural populations, the emptying of the countryside.

Large-scale soy production is mostly performed by *contractors.* Rural contractors typically own machinery but no land. They are hired under contract by *productores-empresarios* (or a group of producers or investors, like the *pool de siembra*), to perform the task of production. Contractors travel with their machines from town to town, from province to province, planting, spraying, and harvesting one field and then moving onto the next one. Further down the line towards contracting and sub-contracting, in which the distance increases between the one that controls resources, the one that performs the cultivating task, and nature, are *production contractors* (*contratistas de producción,* or *tanteros*).

Production contractors own neither land nor machinery but they rent both, hiring other contractors to perform agricultural tasks. Their value-added resides in their know-how in terms of organizing production. Because of the highly technical specificities of using the technological package in extensive areas, agricultural production in the Pampas rests mostly in the hands of "experts." Knowledge of the farm is not passed down generationally but in universities: those in charge of managing production in the Pampas
aren't farmers anymore, not even big landowners, but engineers or masters in business administration, and they self-identify as "entrepreneurs." Just like modernization theorists expected (Mumford [1934] 1963), the role (and value) of labor in agrarian production in the Pampas has transitioned from the physical activity towards organizing production, a managerial task.

*Pools de siembra*, or sowing pools, are investment groups that combine financial investors with a managerial core that rents land, labor, and machinery to produce at a large scale and often includes stock investment in the commodity market (Bustamante and Maldonado 2009). Agricultural production through agribusinesses organized as *pools de siembra* is at the forefront of agrarian activity in Argentina nowadays. *Pools* have emerged to bring in resources after the 2001 crisis and they are unique in that they bring into agricultural activities actors that were not previously involved in agricultural production – and need not be involved or even knowledgeable about it now (Bustamante and Maldonado 2009). GM soy production in the Pampas is a highly profitable activity, interviewees reporting that it gives a much higher interest rate than savings accounts or other investment avenues. Thus, agriculture turns into any other corporate activity where accountability is only to stockholders and decisions about production are purely based on profitability (see Magdoff, Foster, and Buttel 2000; Magdoff and Tokar 2010).

As described in Chapter 3, the neoliberal economic restructuring of the 1990s has radically transformed rural social relations in Argentina. New rural actors have emerged, who relate differently to the means of production. Ownership of land, capital, and labor has become less significant as determinant of class relations. With the introduction of the GM biotech package, now "knowledge" is claimed as the essential means for agricultural
production. "Entrepreneurs," not farmers, not even big landowners, control agricultural production in Argentina nowadays. These rural actors are embedded in the process and at the forefront of technological innovation in the Pampas (Gras 2009b; Gras 2012; Hernandez 2009).

Capitalist entrepreneurship and technological innovation go hand in hand. In contrast to campesinos that live off agriculture (as income and as food), who reported that agrarian practices are tied to culture and tradition,89 farmers from the Pampas region identify themselves with constant technological innovation. They speak of adopting tecnología de punta, of "being on the cutting edge technologically," with a sense of enlightened pride, and claim to be at the forefront of technological world developments that have transformed agricultural production. GM soy production is their banner, the best example of how, in Argentina, "we do the best agriculture in the world."

Interestingly enough, rural workers (employees of large farms) share this perspective. For example, in an interview with Antonio, a recently retired lifetime employee of a large producer (60,000 ha, rent & own, Buenos Aires province), he repeatedly praised his employers as productores muy de punta and Argentine agriculture as being, again, as de punta, the latest of the latest, top of the top. This repeated description of agriculture as de punta, of being on the technological cutting edge, equates, in a unacknowledged and naturalized manner, technological innovation with qualitative improvements (the more and the latest, the better): the unquestionable intrinsic positive qualities of technological innovation (see Mander 1991).

89 Interview with members of Movimiento Campesino de Santiago del Estero-Vía Campesina (MOCASE-VC), Op. Cit.
When discussing GM seeds in particular, another striking difference with campesinos arise: where to campesinos in the North genetically modified seeds symbolize the fundamental violence against culture and life, in the Pampas GM RR soybeans are "just another tool", *una herramienta más*. There is apparently no symbolism attached to GM seeds, as they are considered merely another input (*insumo*) needed for production, and interviewees did not ever find it controversial to discuss seeds' GM features. On the contrary, most times it felt like it was 'just the same' or even irrelevant to discuss GM use in particular (again, as it is just another input). Nonetheless, if GM was discussed within the general topic of agrarian technological innovation, and in particular when discussing the technological package (no-tilling machine + RR seed + glyphosate), then seeds became "improved seeds," *mejores semillas* or *semillas mejoradas*, part of a *círculo virtuoso*, a "virtuous cycle" (the no-tillage method, *siembra directa*, always praised as the really revolutionary agricultural technological innovation because it improves soil conservation and thus promotes sustainability). This shows again that there is in fact a not so subtle symbolism in relation to GM, that of the intrinsic positive qualities of technological innovation.

The adoption of GM biotechnology and its positive framing in relation to benefits/profits can be clearly understood against this background. Agriculture is perceived as a money producing activity, a stark contrast to claims brought forward by anti-GM activists for whom agriculture is a food producing activity. Technological

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90 Except when, instead of discussing the "technological package" or RR soy, the specific issue—and word—*transgenic* came up, which was immediately linked to glyphosate spraying. More on this on the following chapters.
innovation in the Argentine countryside grows inedible greens, the dollars received in exchange for GM soy exports.

_Todos Vivimos del Campo: We All Live Off the Countryside_

The strength of the GM soy model lies on the real and perceived belief that directly and indirectly _everyone_ benefits materially from agricultural production. Thus, the well-trodden phrase: _Todos vivimos del campo_, We all live off the countryside.

In the rural towns I visited in the Pampas region, when I asked, _Y de qué vive la gente del pueblo?_, "How do people here make a living?", the first answer I mostly got was a clear cut _Del campo_, "Off the countryside." Further inquiry into this answer brought up the nuances of this common reply.⁹¹

First of all, there are those who profit directly from agricultural production and live in a rural town nearby the farm (meaning less than 120 miles away, farms that can be visited in a half-a-day round-trip). There is, for example, Federico, CEO and owner of an agribusiness that grows 11,500 ha (rent & own) in the provinces of Córdoba, Santa Fe, and Buenos Aires, and who lives in town, where his business is located.⁹² There is also

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⁹¹ Some would venture to answer, _En el campo_, "at the farm", which struck me as unreal the further I traveled to find anyone who actually got dirty with soil or sunburnt for spending time at the field. With further inquiry to provide details on where and how this general third person _la gente_, "people" or _la mayoría_, "most" work "at the farm," _en el campo_, most would reorient their answer to the meaning of "off the countryside," thus explaining that 'people' are either employed in the service sector or are opening their own stores (with income from renting out their land), compared to being directly involved in agricultural production. Bringing this contradiction/puzzle up to my interviewees almost invariably brought up a reminiscence of the past, a recent past, when they could recall specific names of people they knew who were directly employed in a farm nearby.

⁹² Interview, Buenos Aires, February 2012.
Pedro, landowner and farmer, who directly oversees production of his 1,200 ha farm. Pedro and his wife live in their farm right out of town, in a fancy chalet that stands at the top of a slope, amidst his farmed land, so that from the comfort of the living room, through a glass wall, we have a panoramic view of the soy field, which starts growing about 100 feet away. From the view of the living room, Pedro proudly displays and treasures his bounty. Myself, however, while trying to make sense of this, trying my best to appreciate it objectively, a clear contradiction kept popping up in my head: Why would I, in my sane mind, want to have my own backyard sprayed with agro-chemicals?? Yet, in many of these rural towns, the newly affluent have chosen to stay in town, building huge, expensive houses side by side their farms. This is especially the case for farms that are right at the entrance of the town, or only a few minutes car ride away. This is significant, because compared to farms that are far from town, in here both soy producers participate actively in the life of the town and the rest of town get to see this display of wealth often. In this way, it can be understood that despite the seeming contradiction, the chalets and the soy farms are a sign of wealth and high status for people in town. This comes to show, on the one side, how rather than a grievance GM soy production is associated with benefits, a positive sign of high status. On the other side, it also comes to show the widespread unawareness of the health effects of agrochemical spraying (thoroughly described in chapter 5).

Besides those who both work and profit from agricultural production, there are those who profit directly from agricultural production but do not engage in production themselves: These are people who own land and rent it out for others to produce. Some of

93 Interview, Buenos Aires, February 2012.
94 See NIMBY (Not In My Back Yard) literature (Walsh, Warland, and Smith 1993).
them have never been involved in agriculture, inheritors of a family farm who work in something else, like Sergio, who works as a lawyer. Sergio's children, future inheritors of the family farm, have recently moved to the capital for their undergraduate studies in advertising and graphic design. They know little or nothing about agricultural production, except that it pays for their studies. Others who profit directly from agricultural production but do not engage in production themselves have always been farmers (chacareros), but have chosen to exit agriculture because they "couldn't afford to compete." Small landowners reported that it is more profitable to rent out the land than to engage in production themselves. With this extra income, many have chosen to open small stores as an investment and also as way to find something to do (ocuparse en algo), as by working at the store they make themselves busy and useful. In some small rural towns I've visited, this has resulted in a seemingly absurd town development, as in a town consisting of 40 blocks there is a grocery store or drugstore (kiosco) in every other block, which are then usually empty, for supply clearly outruns demand. Other people who profit from renting out land, however, especially young families with kids growing in small rural towns, have chosen to migrate to bigger rural towns, which have now become small rural cities, as they have all (or most of) the amenities of city life. Common concerns, from mothers in particular, arise from isolation and the lack of services in rural towns. Typically kids living in small rural towns have daily hours-long commute to school. Dirt roads get impassable in rainy days, making transportation harder or impossible, isolating the town. Mothers are also concerned of the possibility of a medical emergency, and thus worry on how long it would take to rush a sick kid to the closest

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95 Interview, Córdoba, February 2012.
hospital. City amenities like schools and hospitals, as well other services such as electricity, gas, clean water, sewers, and paved streets are enticing as they make everyday life "easier" compared to the hardships of rural life.

Agricultural production also provides direct and indirect employment to rural inhabitants (in particular in larger rural towns, pop. ~15,000). For example, Federico's agribusiness employs agronomists (who plan and supervise production), contractors (who perform the agricultural tasks), as well as women employed as secretaries (and I assume, others as cleaning service as well). More jobs are available through ag-related sectors: for example, grain truck carriers (transportistas), seeds and machinery sale, at the agrochemical plant, and at the offices of grain traders/exporters. All large rural towns have representatives of grain traders such as Cargill and LDC Louis Dreyfuss commodities, seed sellers like Nidera, and agricultural machinery. The signs and flags of these business' offices and John Deere tractors and Ford and Hilux trucks parked outside welcome you when entering through the main artery into town.

It is indirectly, thus, how truly "everyone lives off the countryside", thanks to the growth of the service economy fueled by a growth of soy-related income: from renting to employment in the offices of the agriculture and ag-related sector and other sectors that benefit from increased local consumption, from supermarkets, retail stores, and, in particular, construction. Real estate is a sector that has particularly benefitted from the soy boom (as property investments are considered one of the most reliable means of saving, understandable in a country beset by sudden currency devaluations and bank system meltdowns). As I have described in chapter 3, the government also adds to this soy-derived income that flows into rural towns through the Solidary Soy Fund (which
adds to the local township budget) and by handing out monthly subsidies of federal cash transfer programs.

In conclusion, GM soy production brings money and jobs to rural communities. If the business of GM soy production closes down, whole towns will collapse. This is not a context conducive to mobilization (Crenson 1971; Gaventa 1980; Gould 1993; Gould 1991). Of course, as discussed in chapter 2, the economic argument does not necessarily need to trump social and environmental wellbeing; yet in this case, it does. I look further into the issues of social visibility and awareness of socio-environmental degradation consequences of GM soy production in the following chapters.

4.3 BENEFITS OF THE TECHNOLOGY #2: PROGRESS / MODERNITY

Beyond—or rather, in connection with—the material benefits of GM soy production, supporters of GM biotech adduce another significant benefit of the new technology: its ability to bring about Development, Progress, and Modernity. This belief in techno-science, an objective and neutral technology whose success is measured in its ability to control nature, is not new but rather part and parcel of Argentine cultural identity. In this section I argue that there is a cultural preparation that is key to understanding quiescence. The introductory section of this chapter focused on current strategies and mechanisms used by agribusiness and the state to create and maintain consent. Yet, research suggests that similar efforts to create a hegemonic discourse in other countries have failed (such as in Mexico, see Poitras 2008). Then, a new question arises: How could this hegemonic discourse take hold in Argentina? I argue that it took
hold and grew roots in Argentine identity and mindset. In this section I show how Argentines were culturally ready to receive GM biotechnology with open arms.

**Cultural preparation. Argentineanness = Modernness**

Argentine identity is characterized by a very particular perception of nature, ingrained in their very identity as a Nation. Conceived in the 19th century by a group of intellectuals known as the Generation of 1837, Argentine national identity was born modern (Benitez-Rojo 1996; Larraín 2004). Their ideals of modernity fit within the ‘modernization’ paradigm described in chapter 2. Within this paradigm, science and technology have a very special role to play, as they serve human needs to control and modify the natural environment (Mumford [1934] 1963). The exploitation of natural resources in its most effective and productive way – measured in terms of quantitative growth and higher profitability –, it’s a main goal of modernizing programs (and, as described above, the main goal of Argentine GM soy producers). Argentine national identity was conceived modern in this sense, and thus deeply anti-nature, pro-science and technology, and Buenos Aires-centric. I argue that because this modernization paradigm are the glasses through which Argentines perceive their relationship to nature, they were culturally ready to perceive the biotechnology of GM seeds in a positive light.

In what follows, I trace parallels in perceptions of and approaches to nature in Argentina in the 19th century and today. I look into the essays of the Generation of 1837, in particular at Domingo F. Sarmiento’s *Facundo* and Juan Bautista Alberdi’s *Bases*, as

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authors agree that these are seminal texts of Argentine national identity (Shumway 1991; Sorensen 1996). Then, jumping to the 21st century, I look at how this 19th century discourse is still today part and parcel of the Argentine mindset/cultural framework (in particular of GM soy producers). The main goal is to show that the pro-GM discourse does not arise ‘naturally’ but rather that it is a construct of power, a hegemonic discourse created by a powerful elite to create consent and quiescence as it resonates with deeply held values in Argentine society (Gramsci 1972; Lukes 2005).

The Root of It All: Conceiving Argentine Identity, Becoming Modern

Soon after Argentina gained independence from Spanish rule in 1816, the criollo ruling elite set to the task of creating a country where there was none. Argentina had to be created from uniting scattered pieces: a port city, Buenos Aires, head of the ex-Viceroyalty, home of the criollo elite and linked to Europe through commerce; a few other smaller cities in the interior provinces that had been important during the viceroyalty as trading spots (like Santiago del Estero and Córdoba); the Pampas, the vast grasslands owned by wealthy big landowners (hacendados), scarcely inhabited by cows, some rural, mixed-race population and some indigenous groups that every so often, in malones, took over the property of the hacendados; some towns and rural villages in the interior provinces, producing for domestic consumption; and the rest, a huge land, unknown, unexplored, unlimited97 (Rock 1987). And among all those pieces, no sense of

97 This is from the perspective of the elites in Buenos Aires, of course. Several indigenous groups (like the Patagones and Mapuches in the south, the Guaranies in the north, etc.) inhabited Argentine territory and they knew it very well. Francisco Moreno’s Viaje a la Patagonia Austral, written during his scientific expedition to Patagonia in the
unity, no sense of shared history or future, no shared myths of peoplehood (Shumway 1991: 2). Defining *nationness*, creating a national identity, became a task that had to be crafted almost from scratch (Benítez-Rojo 1996; Shumway 1991). Similar efforts were taking place continent-wide, throughout the newly independent Latin American nations (Benítez-Rojo 1996).

The Generation of 1837 was a group of young intellectuals that took upon themselves the task of creating “guiding fictions,” the myths of national identity that were essential to unite the country (Shumway 1991). Esteban Echeverría (1805-1851), Juan Bautista Alberdi (1810-1884) and Domingo F. Sarmiento (1811-1888) were the members of this group that contributed the most to the enterprise of creating a national identity, to define *Argentinianess* (Benítez-Rojo 1996; Halperín Donghi 1994; Shumway 1991; Sorensen 1996). All of them skillful writers, they used novels and essays as their “strategy” to create a national identity after independence (Benítez-Rojo 1996:417).

Highly educated in the European values and ideas of the epoch, these authors were deeply embedded in the mood of the Enlightenment, looking north from the South Cone, admiring the revolutionary feats of France and England and the development of the newly independent British colony, the United States. Their ideals were modeled after the ideals of the French Enlightenment, of Positivism, and of British Liberalism. Rousseau,

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98 For Shumway, guiding fictions are like myths, stories that make up national identities. For example, in the United States, the idea of America as a ‘melting pot’ or the ‘American way of life.’ As Shumway (1991:xi) explains: “The guiding fictions of nations cannot be proven, and indeed are often fabrications as artificial as literary fictions. Yet they are necessary to give individuals a sense of nation, peoplehood, collective identity, and national purpose.”
St. Simon, Comte, Adam Smith, and David Ricardo were the authors they admired.

*Progress, industrialization, free trade*, their cherished beliefs. *Modernity* the ultimate goal\(^99\) (Pigna 2009; Shumway 1991). This modernization-is-progress culture was shared by the elites of the newly independent countries throughout Latin America (Burns 1980).

The project of nation building arose from these ideals: *Argentinianness* and *modernness* became then inextricably linked (Benítez-Rojo 1996; Larraín 2004; Shumway 1991). Making Argentina *modern*, bringing in *civilization* was the task. According to the Men of ’37, many obstacles were impeding Argentina’s path into joining the modern nations of the world.\(^{100}\) What were the problems—*los males*—of Argentina? These intellectuals identified three: (1) *la tierra*, the “land”: the vast, unknown, “uninhabited” plains of the Pampas, the “desert,”\(^{101}\) where the rural masses

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\(^99\) The Generation of 1837 will come up with a very special type of Modernity though, one adapted to the realities of Argentina as a peripheral nation, as a poor country that depends on the exploitation of nature for foreign income (Coronil 1997). The result thus, was not an exact copy of European modernity; it was neither autochthonous nor imposed from the outside in its entirety, but rather a “mixture” or a “hybrid” (García Canclini 1990, Larraín 2000). Some authors refer to this version of Latin American modernity as *subordinate* or *peripheral* (Sarlo 1988).

\(^{100}\) To understand the mentality of the Men of ’37 it is important to understand their historical context: In the 1840s, Argentina was divided in two factions: the *Unitarios*, liberals who wanted to have a centralized government seated in Buenos Aires, and the *Federales*, conservatives who wanted a decentralized government (and thus, more power to the provinces). At this time, power was with the *Federales*, and Juan Manuel de Rosas, the *caudillo* of the province of Buenos Aires was the *de facto* ruler of the country. Rosas was an *hacendado* and had strong popular support from the rural masses (see Luna 2005, Pigna 2009, Rock 1987). The Men of ’37 and Rosas were deeply opposed and thus many of them wrote from exile, until the end of Rosas rule, in 1852.

\(^{101}\) Despite being one of the most fertile lands in the world and of actually being inhabited by many, these authors referred to the Pampas as the “desert.” *Facundo* opens up saying: "The disease from which the Argentine Republic suffers is its own expanse: the desert wilderness surrounds it on all sides and insinuates into its bowels; solitude, a barren land with no human habitation, in general are the unquestionable borders between one province and another. There, immensity is everywhere: immense plains, immense forests, immense rivers, the horizon always unclear, always confused with the earth amid swift-
lived; (2) the Spanish tradition, catholic and backward, the religion of the masses and the conservatives; and (3), la raza, the “races”: the indians,\textsuperscript{102} the gauchos,\textsuperscript{103} the ethnically mixed poor that lived in the countryside (Pigna 2009; Shumway 1991).

To the barbarism of the Pampas and of rural livelihoods, the Men of ’37 opposed the civilization of the city of Buenos Aires and Europe. They had a dichotomous view of Argentine society where the countryside (the Pampas) represented the source of all ills in Argentina and the city (Buenos Aires/Europe), the prescription, the model of what Argentina should become. It was Sarmiento, in his essay Facundo, the one that simplified the ideas of the group in a formula: Civilización o Barbarie, Civilization or Barbarism. This dichotomy became the motto of the Generation of 1837, and, later, the most basic way in which Argentines understand their country (Sorensen 1996). It became one of Argentina’s most enduring guiding fictions (Shumway 1991). With this dichotomy was also born an enduring polemic that permeates Latin American thinking and writing from the 19th century to today (Swanson 2003).

Sarmiento’s essay, written in 1845, is called Facundo: Civilization and Barbarism in the Argentine Pampas.\textsuperscript{104} As summarized in Table 1, an analysis of this book reveals that the dichotomy civilization versus barbarism\textsuperscript{105} implies:

\textquote{moving clouds and tenuous mists, which do not allow the point where the world ends and the sky begins to be marked in a far-off perspective.”} (Translation by Kathleen Ross, Sarmiento 2004: 45-46).

\textsuperscript{102} The indigenous peoples, who in Spanish are called “indios” because when Columbus arrived to the Americas he thought he had made it to India.

\textsuperscript{103} The gaucho is the rural inhabitant of the Argentine pampas. Some authors define gaucho as peasant; thus, he would be a version of the Latin American campesino (Ludmer 1996, Shumway 1991). At this time, they were mostly mestizos, mixed-race, the sons of Indian mothers and conquistador fathers. They were landless and usually vagrant, living on and off small rural jobs (Ludmer 1996).
Table 1. Civilization vs. Barbarism in Sarmiento's *Facundo*

<table>
<thead>
<tr>
<th>Civilization</th>
<th>Barbarism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man-modified environment</td>
<td>Nature</td>
</tr>
<tr>
<td>City</td>
<td>Land (&quot;Desert&quot;)</td>
</tr>
<tr>
<td>Buenos Aires</td>
<td>Pampas</td>
</tr>
<tr>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>Modern</td>
<td>Traditional</td>
</tr>
<tr>
<td>Rational</td>
<td>Emotional</td>
</tr>
<tr>
<td>“intelligence”</td>
<td>matter</td>
</tr>
<tr>
<td>Science</td>
<td>Religion</td>
</tr>
<tr>
<td>Great Britain / France / USA</td>
<td>Spain / the Americas</td>
</tr>
<tr>
<td>Protestantism</td>
<td>Catholicism</td>
</tr>
<tr>
<td>City-dweller</td>
<td>Gaucho</td>
</tr>
<tr>
<td>European-descent</td>
<td>Indian/black/mixed race</td>
</tr>
<tr>
<td>Man</td>
<td>Woman</td>
</tr>
<tr>
<td>Industrious</td>
<td>Lazy</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Cattle-raising</td>
</tr>
<tr>
<td>Efficient</td>
<td>Inefficient</td>
</tr>
<tr>
<td>Constant</td>
<td>Erratic</td>
</tr>
<tr>
<td>Predictable</td>
<td>Unpredictable</td>
</tr>
<tr>
<td>Reliable</td>
<td>Unreliable</td>
</tr>
<tr>
<td><strong>Productive</strong></td>
<td><strong>Unproductive</strong></td>
</tr>
</tbody>
</table>

Source: Author, based on Sarmiento [1845] 1874.

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104 ‘Facundo’ was Facundo Quiroga (1788-1835), caudillo of the province of La Rioja, also known as *El Tigre de los Llanos*, the Tiger of the Plains.

105 This dichotomy resembles Tönnies’ classical sociology pair *Gemeinschaft-Gesellschaft*; a dichotomy that is, as Sarmiento’s, immersed in the modernization paradigm: The transition from traditional/feudal societies (*Gemeinschaft*) into modern/capitalist society (*Gesellschaft*) is understood as a linear (evolutionary) movement towards progress, modernity, and higher rationalization (Tönnies [1887] 1963). Even if the pair civilization/barbarism somewhat fits the categories modern society/traditional society, there is a key difference among them: for Tönnies (and those that follow him, like Marx, Durkheim, Weber, and Parsons), the *Gemeinschaft* is in the past, it has been already superseded by industrial society (even if some rests remains), this is why some of these authors (like Durkheim and Weber), appear a little nostalgic, the romantic traces of a past lost. Compared to what has happened in Europe, in Argentina ‘civilization’ and ‘barbarism’ *coexist* in time, and thus, there can’t be any romanticism because nothing has been lost yet. For the Men of ’37, the barbarism that arises from the Pampas is like the plague. Thus, it must be exterminated.
Sarmiento, as the Men of ’37, was influenced by the ideals of the Enlightenment and the industrial revolution. Thus, he analyzes the "ills" or "diseases" of Argentina within this mindset. "Barbarism" is what is wild, savage, yet untouched by human hand: Land, Nature; and the indigenous peoples. "Civilization" is the example of northern Europe and the future of the United States, the refined modals of the British, the high culture of the Parisians, and the laboriousness of Protestant farmers in the United States.

In Facundo, the Pampas are a risky place to be and Sarmiento warns us about the possibilities of getting caught by a snake, a tiger, or the "savage indians." He is also fearful of vagaries of the weather, telling stories of thunderstorms in the middle of the countryside. To the ugliness of rural life, he opposes the theaters and literary societies of Buenos Aires.

Sarmiento blames the ‘land’ for all Argentine ills. But the problem is not the land itself. It is the land untouched by human hand: the unproductive land. At the time of Sarmiento’s writing, the Pampas was cattle-ranching territory. And while cattle derived products were the source of most of Buenos Aires' foreign income (through Buenos Aires’ Customs House), Sarmiento still perceives it as an unproductive activity. Why? Because of his modernizing gaze. Efficiency is measured in quantitative terms and it relates to the ability of controlling production in order to keep it steady and predictable.

Nature, untouched, is nothing like that: Cows, left to roam in the vast grasslands, graze at

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Note how Sarmiento points at the potential productive capacity of the land, how the Pampas are meant to be productive: “In the center, parallel zone, the Pampas and the jungle dispute the land for a long while; the forest dominates in places, then breaks down into sickly, spiny bushes; the jungle appears again thanks to some river that favors it, until in the south the Pampas finally triumph and display their smooth, downy brow, infinite, with no known limit, no noteworthy break. It is an image of the sea on land, the land as it looks on the map, the land still waiting for a command to produce plants and all kinds of seeds.” (Translation by Kathleen Ross, Op. Cit, p.46).
will and they fatten—or not—depending on the quality of the grass, which depends on the quality of the soil and on the amount of rain and sunshine that happened that season, summers are better than winters. Compared to the factories in Great Britain, Sarmiento’s Pampas are an unreliable business. Thanks to the scientific discovery of coal-based energy (a source of energy that can be controlled and stored, and that serves as a source of artificial lightening) and the development of a very special machine, the clock, every working day at the factory starts and ends the same hour, rain or shine, sunrise at 6 or at 9 am. Technology and science help to disassociate production from nature; and this quest for the control of nature is, for Sarmiento and the whole modernization paradigm, the highest goal in human life (Mumford [1934] 1963).

Juan Bautista Alberdi, another of the Men of ‘37, was mostly responsible for developing the main program to civilize Argentina. Its main tenets, aimed to target those previously diagnosed ills, were (1) promote immigration from Northern Europe, and (2) free trade, based on comparative advantage (Alberdi [1852] 1957). Argentina was not to become England, factories were not meant to sprout from the Pampas; that was not her role in the concert of nations. Argentina’s comparative advantage, like other nations of the Global South, is to export nature (Coronil 1997). Thus, the focus became how to make the countryside productive, in modern terms. Alberdi recommended to move away from cattle ranching and specialize in agriculture, which is capital and labor intensive. If, Alberdi continues, the Argentine government does not own enough funds to invest in adequate technology, then, he goes, “let others do it.” Alberdi recommended to abolish all protective tariffs and to open the country to foreign investments, loans, and partnerships to jump up the process of technological transformation. In sum, for Alberdi,
the solution to Argentine ills would “involve some sort of appeal to Europe and the US, through imitation, immigration, investment, or imported technology” (Shumway 1991:156).

The ideals and projects envisioned in the essays of the Generation of 1837 became a reality soon after. In the 1880s, the liberal ruling elite known as the Generation of 1880s, consolidates the Nation; a Nation modeled after the ideals of the Men of ’37: through the creation of a national system of public education by Sarmiento himself, and setting up a model of economic development based on Alberdi’s program (Sorensen 1996: 99, 103).

Thus starts the process of modernization of the Pampas through promoting European immigration and allowing foreign direct investment (FDI) for infrastructure and technology transfers. British intervention, through loans, credits, and direct investment, as well as new (foreign) technological developments became essential for the development of the agro-export model of the 19th century (Barsky and Gelman 2001; Pigna 2009). Railroads and new ports paid by the British, as well as the refrigerated ships for meat, linked production in the Pampas to the European markets. New planting and harvesting machinery are introduced from the U.S., Great Britain, and France. Also new breeding techniques and new ‘improved’ breeds of cattle are introduced at this time (Barsky and Gelman 2001). This time (1880-1914) is the height of the agro-export

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107 Conquering the territory was also part of the modernizing program. To achieve this, the government starts a series of campaigns to exterminate the indigenous groups that lived in the “desert” (like President Roca’s Conquista del Desierto campaign in 1879). There are here clear parallels with the history of the United States, in the ideology of "manifest destiny" and making the Western "wasteland" productive by clearing the native peoples and large animals. Pigna (2009: 368) makes a very good point on how developments in technology were key to taming the Argentine Pampas: Remington rifles!
model, and when the myth of Argentina as the “Breadbasket/Granary of the world” – *Argentina, Granero del Mundo*– is created (Pigna 2009). At this time, Argentina exported meat and cowhide mostly to Great Britain, an agro-export model that had its boom in the late 19th century (Pigna 2009; Rock 1987). Argentina’s per capita income was then among the highest in the world and it was likened to other also newly independent countries –in particular to Australia, Canada, and the United States– in terms of its potential to join the rich nations of the world.\(^{108}\) The Argentine countryside, finally mechanized, was producing vast amounts of food and foreign income. Huge waves of European immigration populated Argentine cities and their children become Sarmiento’s version of Argentine citizens, thanks to the newly developed free, public, and secular education system. The model became an apparent success; and thus a myth was created, it was Argentina’s *belle époque*.

Today, two centuries after independence, the ideas and the ‘belle époque-myth’ of the 19th century are well alive in Argentine minds; a “guiding fiction” (Shumway 1991) that came out often in interviews when discussing agricultural production: This time, with Germán,\(^{109}\) we’re talking about Argentina’s history of agrarian innovation, and there’s a pride in how we, Argentines, were at the lead in the 1930s, the first world developers of a *cosechadora autopropulsada*, the combine harvester:

\[\text{G: (...) At that time we were more advanced than Europe!}\]
\[\text{A: And then, what happened after that? [meaning, how did we lose that status?]}\]
\[\text{G: Well... After that comes decay (*la decadencia*). We were the "Granary of the World" in the 30's, we were at par in everything, in GDP, with Australia,}\]

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\(^{108}\) Despite its apparent success, this model collapsed soon thereafter, due to a decrease in global demand during the First World War and the Great Depression, among other reasons (see Pigna 2009; Rock 1987).

\(^{109}\) Interview, Buenos Aires, July 2011.
Canada... And then, that is, we declined as a country (nos vinimos abajo) and Australia and Canadá are what they are today. (...) [Although] The reality of the agricultural sector, as far as I understand, is different from what happened in the rest of the country. While the country is not at the top in global terms (el país no es punta a nivel mundial), the agricultural sector is. (Germán is unequivocal in his affirmation). Today, [in terms of] the technologies employed and the level of technological innovation, we are at word-class (estamos a primer nivel del mundo).

The contrast of what Argentina was, that period when the country was at par of other rich nations is held as a folk tale, as a “guiding fiction” (Shumway 1991) particularly strong when set in contrast with the state of “crisis” Argentina has been ever since (what Germán refers to as decay, Decadence, as the despair of the promise and potential not fulfilled: Argentina did not end up being like Australia or Canada, but a poor country like the rest of Latin America). At the same time, however, the adoption of GM biotechnology and the soy export boom represent a glimpse of hope: the return of Argentina to that place where it was, its rightful claim to its role as the Granary of the World, and at par with the ‘developed’ world: a primer nivel del mundo, highest world level, top of the top: de punta, at the technological cutting edge. It is in this mindset that Argentines frame GM soy production, a mindset that has proven to be the most convenient cultural framework for the introduction, adoption, and use of the biotechnology of GMOs.

Taming Nature, 21st Century Style: Biotechnology and GM Soy

In the 19th century, a conception of Argentina as a Nation is created: Argentina was meant to be an agro-export nation. The rationalization of the countryside, through increased mechanization, will permit Argentina to tap into its comparative advantage,
agricultural production. Taming the barbarism of the Pampas will bring about economic and social development; thus, progress and civilization. Therefore, the ideal of Argentina becomes to be an agrarian nation, but without farmers. Rural life is downgraded as backwards, as a primitive stage in human development. Progress, civilization, high-culture resides in the cities, especially in Buenos Aires, as it is linked to Europe through its port. Thus, a very specific conception of nature emerges, one where Nature is opposed to Progress and thus in need to be superseded; and a very specific model of development, based on the exploitation of natural resources through continuous technological innovation. These two ideals soon after become consolidated in the idea of Nation and thus ingrained in Argentines’ minds.\(^\text{110}\)

\(^{110}\) It is important to point out that this modern mentality does not emerge uncontested: A reaction towards the ‘modern’ mentality emerges right afterwards as a “competing” myth of nationhood, where the elements of barbarism are elevated and aggrandized and placed at the core of national identity (Shumway 1991: 299). “Argentine identity” is not one, but two: Nationalism, or populism, becomes the reaction against the liberal-Europeanized 19\(^{th}\) century elite, and throughout the century and until now its discourse still resonates in Argentine life (Shumway 1991: chapters 9-10). In the mid 20\(^{th}\) century, President Juan Domingo Perón and his party, Peronismo, articulated best the nationalist/populist discourse. In terms of agriculture, during the Perón-administration, agriculture was thought of as a specialization to be transcended, as industrialization was promoted through government intervention (this is in the context of the World War II and its aftermath, and the popularity of Keynes' ideas). In terms of the Peronista discourse, those against the new model of development, those who believed in the ‘modern’ agro-export program, became imperialistas, oligarcas, vendepatrias, the big landowners being one of the targets of those epithets. And so while there is a real break in terms of Argentina’s orientation, looking inwards rather than outwards, in terms of perceptions towards technological development and nature, some basic features relevant to my argument still remain: The populism of Perón is primarily an urban and industrial movement (see Conniff 1982). The national government promoted industrial development in suburban Buenos Aires, which encouraged massive internal migrations from the provinces, emptying even more the rural landscape. Development and Progress are still measured in terms of increased productivity –measured as ‘economic growth’–, which require constant technical innovations and, thus, increasing natural resource extraction (as fuel and chemicals) and of polluting activities (as waste of industrial activity) (Gould, Pellow, and Schnaiberg 2008, Schnaiberg 1980, Schnaiberg and Gould 1994). Therefore, under
In the 21st century, the model for Argentine development returns to its roots planted two centuries earlier, as if the discourse and the model of the 19th were revamped to fit contemporary global neoliberal ideology. The United States, through Washington institutions and Chicago schools, replaces Europe as the geographic source of values and ideals. Free market and comparative advantage, now with corporations, not states, leading the process, become a renewed version of liberalism (see chapter 2). In the 1990s, Menem’s administration starts a process of deep neoliberal restructuring with the goal of converting Argentina into "a modern capitalist country by repeating mid-nineteenth-century liberal economic policy and attracting foreign direct investment, [aiming to repeat] the agrarian export boom of the belle époque." (Carranza 2005:68).

And thus, the process that started in the 19th century of taming the Pampas, of mechanizing the countryside to increase agricultural production for the export market, takes a further twist. Since the neoliberal 1990s starts the process towards agro-industrial production for export, but now with two key new variables: transnational corporations and the biotechnology of GM seeds (see chapters 2 & 3). Within the modernizing paradigm, the biotechnology of GM seeds becomes one of the latest technological developments towards complete control of nature. Once scientists were able to decode the DNA of plants, the code of life became open for modification. Nowadays, crops reproduce in labs, not in farms anymore; and they are homogenous and standard, in taste, shape, size, and ripening times, necessary qualities to allow for mechanization (Kloppenburg 2005:177).

Close scrutiny, under the populist Peronista government some patterns remain in terms of perception towards technology and nature, which show that throughout the different stages of Argentine economic development, there is consistency in terms of cultural preparation towards biotechnology and GMOs.
Mechanization and automation of the farm are the goal. As Mumford ([1934] 1963) claimed, the displacement of the worker by the machine was a necessary and positive development: in displacing physical labor, machines will do all hard work for us and, moreover, produce a superior product, one that is homogeneous and standardized. The role of the new worker is to oversee and regulate the performance of the machine, to be technicians and engineers, as well as to organize production, rather than perform the task of production itself (Mumford [1934] 1963). The agro-industry is the farm converted into a factory. As the market provides for machinery, fossil fuels, seeds, fertilizers, herbicides, and pesticides, it is finally possible to have control over inputs that previously depended upon nature. GM soy producers in the Argentine Pampas constantly mention the need to reduce variability and uncertainty, which they link to nature and natural cycles, such as weather, rainfall, and human labor. The best compliment in the field is: *Mirá qué prolijo, qué perfecto el surco*, "Look how clean and well-ordered, how perfect the furrow is," referring to the automated work of the no-tillage sowing machine. Beauty resides in cleanliness and predictability, qualities expected in an enclosed environment rather than in the middle of the countryside. Some farmers, when describing the no-tillage machine, referred to it as having *precisión quirúrgica*, surgical precision. The analogy is revealing; there is probably no other place that is as controlled and aseptic than an operating room.

It is important to point out that this mentality is shared by all GM soy producers that I interviewed, regardless of the location of production. This is certainly a Pampas’ producer mentality, but this mentality is expanding with the agricultural frontier. Thus,

111 The other most important source of uncertainty for the producers is the Kirchners’ government. I discuss this further in following section, under grievances.
similar arguments were given by GM soy producers in Chaco and Santiago del Estero.

The contrast, however, is striking, because the Pampas were already flat and “deserted,” ready for large-scale agro-industrial production. The North is the forest, the jungle. In soy producers’ minds, *topar el monte*, bringing the forest down to make room for agricultural production, is to “clean it up”, which at the same time means to bring light, as now you can see through it (very Enlightenment-like – and Foucauldian: to see (where the gaze can set) is to know, to know is to control (Foucault 1994)) – the reenactment of Sarmiento’s civilizing thought: to populate is to control and to make productive. See for example, Carlos’ description of what el Chaco was 30 years ago and now:¹¹² Carlos is a self-identified entrepreneur, a landowner who rents the "prepared" (*topada*) area of his property (650 ha) for soy production in the Chaco province, an area known as the *zona núcleo de la soja del norte*, the core (most productive area) of soy production in the North.

C: When we were there, surrounded by the forest (*en el medio de ese monte*), they were showing us the fields/plots [the ones that they were interested to buy]. But then, 32 years ago, it's not the same as now, in the sense that now it's much more populated (*está mucho más poblado*). Nowadays you see vast fields, cleared down (*topados*), with soy. At that time there was nothing but the roads made by the Colonization Institute, the rest was the forest (*monte*). *Monte, monte, and monte*. And more *monte, monte*, and *monte*. So you would drive on those dust roads, and there would be *monte* on your left and *monte* on your right. The view/eyesight ended there, 10 meters [30 feet] away.

A: *El monte* is the forest, like the jungle then...

C: Yes. Trees [that are] ten, twelve meters high. Fifteen [50 feet high]. And it's not that you see this tree and you can get down there. No. Down there is the understory, the *fachinal*, the brush (*el monte bajo*).¹¹³ You can't go through there,

¹¹² Interview, Chaco, July 2011.
¹¹³ Understory = A layer of vegetation beneath the main canopy of a forest (Dictionary entry). *Fachinal* is the name given to this biome, characterized by the presence of a closed steppe (*estepa cerrada*) of tall and thick grasses and shrub imbrication.
http://es.wikipedia.org/wiki/Fachinal
not even walking/on foot. 'Cause down there, there are the cardo gancho [a thorny, cactus-like bush]. To get in there, you need a machete.

The Colonization Institute of Chaco took then a very appropriate name: in charge of "colonizing" the monte, making productive what is untamed, civilize it. Same is to Carlos, who faced to the thickness of the monte, where you can't see through or walk through, topar, to clear the monte down, means to bring light and to make it productive: the light of civilization that agro-industrial production brings.

The dichotomy 'civilization vs. barbarism' crystallizes a main concern for Argentina (and to other Latin American nations), since its early origins: how to consolidate the nation in the face of the perceived threats and instabilities of nature (Swanson 2003). The paradigm that arose and consolidated in Argentines' minds elevated the "civilization" part of the dichotomy – order, modernity, progress – over the "barbarism" of nature, which could be "tamed" and "modernized" through mechanization. Ever since then, the notion of technological innovation as an all-benefits endeavor in the quest for the control of nature became ingrained in Argentines' minds. This is, I argue, the most propitious cultural context for the introduction of GM soy biotechnology in Argentina. In other words, Argentines were culturally ready to perceive (and receive) the technological package of GM soy with open arms. This is the historical and cultural origin of the all-benefits discourse of technological innovation in general and of GM biotechnology in particular in Argentina. It is, therefore, a key component to understand quiescence.

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114 Cardo gancho is part of the bromelia serra plant family. http://www.sib.gov.ar/ficha/PLANTAE*bromelia*serra
In the last chapter and up to now, I have shown how the hegemonic discourse of GM soy is all-benefits and no costs: In this mindset, the celebratory claims of technological innovation are unquestionable (see Mander 1991). The aim of this dissertation, however, is to question this very notion, by asking what are the costs of this agrarian transformation, and how are those distributed. As Burns (1980) argues, the quest for 19th century Progress in Latin America in fact created continent-wide Poverty. As I show in the following chapters, GM soy is not all benefit but it has heavy costs for society and the environment. For soy producers however, these are not of primordial importance. The main grievance arising among rural producers does not come up with the expansion of GM soy, but rather on its limitations. This is what I turn to in the following and last section.

4.4 MAIN GRIEVANCE: A CONFLICT OVER PROFITS

As I have shown in this chapter, GM biotechnology is framed mainly in terms in benefits. In this last section I focus on the main grievance constantly brought up by interviewees: That is the government, the Kirchners' administrations.

All those I've interviewed, (but it was particularly emphasized by those that coordinate the activities or are employees of pools de siembra) spoke of the need to "reduce variability". GM is thus praised because it allows for increased control of production (the taming of nature described above). Thus, minor grievances are related to climate conditions, drought, excessive rain, etc. The main and major grievance is also related to the need to "reduce variability" in what they perceive as a climate of political instability and uncertainty: it is the Kirchners' administrations. This is the main source of
uncertainty (and anger) brought up by producers and employees alike, wary that anytime, overnight, the government may or may not set new tariffs, limits to exports, raise export taxes, etc. The way that large pools de siembra have managed to reduce this 'political variability' has been expanding production to other countries (therefore, under other governments). This is the agribusiness' logic to reduce uncertainty, linked to the need to maintain a steady production output.

This main grievance burst in mobilization in March 2008, after the announcement made by president Cristina Fernández and then-minister of Economy Martin Losteau that would raise export taxes on agricultural production (see Giarracca and Teubal 2010 for a chronology of events). This measure, Resolution 125/08 announced on March 11, 2008, implied a change in tax rates for agricultural exports, particularly impacting soy and sunflower, wheat, corn, and their derived products, from a fixed rate to a sliding rate pegged to commodity prices (at higher commodity prices, higher the tax rate). For soy exports that meant a tax increase from about 33% to 44%. The announcement of this tax hike was the "catalyst of an agrarian protest unprecedented in its magnitud in Argentina" (Barsky and Dávila 2008:7, my translation). This protest came to be popularly known as el Conflicto del Campo, the Countryside/Agrarian sector Conflict.

The Conflict lasted 129 days, from March 11 to July 18, 2008, ending with the repealing of the Resolution 125 (and the resignation of the Minister of Economy). It was led and organized by the four major national associations of rural producers: Sociedad Rural Argentina (SRA), Federación Agraria Argentina (FAA), Confederaciones Rurales

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Argentinas (CRA) and CONINAGRO (Confederación Intercooperativa Agropecuaria Limitada). Despite their different allegiances and memberships, these four organizations organized under one same umbrella organization, the *Mesa de Enlace*.\(^{117}\) During the almost four months that the Conflict lasted, major national chaos arose: The repertoire of the *Mesa de Enlace* involved blockading major national routes, interrupting the circulation of goods and people, leading to major shortages in cities’ supermarkets (and people's vacations on Easter weekend). There were also several mass rallies in Buenos Aires and Rosario, the largest of Argentine cities. Urban sectors supported the Conflict, filling up the *plazas* during the rallies, banging pots and pans, and carrying signs declaring *Yo estoy con el campo*, "I am with the countryside/agrarian sector." This sign became the banner of urban sectors disgruntled with the government, displayed in car bumper stickers and window signs in shops and homes.

The strike took such unprecedented size as to hit world news.\(^{118}\) In Argentina, *el campo* became then the only thing that people talked about in the streets and what was covered by the media. Suddenly, *e-ver-y-th-i-ng* became an issue related to the agro-export producers, the strike, the export taxes, the Kirchners government, and the queen of the story: soy. The strike then opened a window of opportunity to contest the expansion of GM soy as, for once, there was an open discussion in the media on this topic (on the papers and TV shows, both for, as always, but in particular, showing its negative effects) and also as important, because the government confronted *el campo*. This represented a

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\(^{117}\) It is important to note that the *Mesa de Enlace* did not encompass the interests of all rural sectors: in particular of campesino and indigenous communities (Teubal and Palmisano 2010). I will discuss their interests and grievances in the next chapter.

break in the alliance I discussed at the opening of this chapter. As a struggle over a tax hike, the break of the alliance was over profits, over the material gains of the GM soy model (Richardson 2009; Svampa 2008). This was not contestation over the model itself, or GM in particular. Still, the change in political climate had an impact on social responses: It made the issue visible and thus opened a window of opportunity for social protest (McAdam 1982). This is what I turn to on the next chapter.
CHAPTER 5. CONTESTATION

As described in chapters 2 & 3, there are negative socio-environmental consequences to GM soy production and some have framed those as grievances. Who are these people and what do they demand? Moreover, why aren't these movements and assemblies getting the voicing they deserve? These are the questions I address in this chapter.

5.1 POWERLESSNESS

Who bears the costs of technological change and natural resource extraction? The unequal distribution of social and environmental costs and benefits is tied to socio-economic and political inequalities, and results in that generally the powerful reap most the benefits at little or no cost whereas the powerless bear most costs without much benefit (Gould, Pellow, and Schnaiberg 2008; Gould 2006; Mohai, Pellow, and Roberts 2009; Schnaiberg 1980). As argued in chapters 2 and 4, the powerful control natural resources and also have decision-making power over technological developments. The main problem is that generally power elites are the ones furthest removed from those resources (nature) and the consequences of their decisions (Gould 2006; Gould 2010). Neither Monsanto's CEO nor the Argentine president live by a soy farm, none of their children are regularly sprayed by agrochemicals, none of their homes have been bulldozed to make room for agricultural production. The decisions of the pro-GM soy corporate-state alliance are taken from offices in luxury buildings in downtown Buenos Aires, if not in the offices of corporations in other city capitals around the world. From
there, they reap most of the political and economic benefit and bear none of the social and ecological consequences.

Environmental justice (EJ) theory focuses on the distributional and spatial aspects of access to environmental and social goods and bads,119 with a particular emphasis on race/ethnicity and class (Mohai, Pellow, and Roberts 2009). Hence, EJ studies "conclude that, in general, ethnic minorities, indigenous persons, people of color, and low-income communities confront a higher burden of environmental exposure from air, water, and soil pollution from industrialization, militarization, and consumer practices." (Mohai, Pellow, and Roberts 2009:406). That is –again– because these groups typically have no political or economic leverage over the resources that guide production or militarization processes, thus they cannot really decide where the toxic waste facility will stand, neither can they move out of the community when the incinerator is already at work. Power, therefore, is at the root of the unequal distribution of social and environmental goods and bads (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980).

As described in chapter 3, it is in the north of Argentina where the expansion of the agricultural frontier of GM soy has brought the harshest social and ecological consequences. It is here also where we find record poverty levels, highest rural populations, mostly indigenous, and the historically marginalized (see Domínguez 2009; Lapegna 2011). This reality stands in striking contrast with the GM soy boom: It is August 2011 and I'm interviewing the CEO of a local agro-export company in a rural

119 Examples of environmental "goods" are: clean air, drinking water, access to green spaces, living wages, proper housing, etc. Environmental "bads" are thus the opposite of environmental goods, such as pollution, living close to toxic facilities, etc. This is thus a broad consideration of the "environment," that goes beyond Nature (i.e., as a protected National Park) to include all social living situations.
town in Chaco, another town that has been "blessed" by the soy boom. The town's transformation, all due to the soy bounty, is, in his own words, la Fiesta del Chaco, "Chaco's Party". With soy, abundance has finally arrived to town. And for him, it certainly has. Surrounding this office where we converse stand silos storing several hundred thousand dollars in crops and a trucking fleet. Yet only ten blocks away it isn't a party anymore. The poorest of the poor live here. In this town, a third of the population lives on welfare. When I'm visiting, it's wintertime and it's 60°F (in summertime temperatures typically rise to 130°F). This place is hot, dry, and arid. Poverty and inequality strike my eyes:

This is a very, very sad party. Poverty is absolute. It's not like a slum, where everyone is crowded; there's room here, open space. (...) People's homes, el ranchito, stand alone in the middle of the plot, the plot is of trodden earth. No grass. Grass is for the rich who can water and tend to it. Houses are tiny and they fit families of 12 or 15. Many (most of them) are one-room houses, a box of exposed brick, or stick and mud, and a tin or thatch roof, not larger than 3 by 3 [meters, 10 by 10 feet], with a wooden door and a tiny window; a really tiny window on the side facing the front, a wooden aperture with no glass on it, sometimes covered with cardboard, tin, or plastic (so sadly ironic, most times this is waste material, formerly ad signs or packaging of ag products so that the windows read Coca-Cola, or Roundup). There are also lying around the empty jerrycans of agrochemicals that I was told were used to carry water. The bathroom is a latrine and stands outside of the house, a few meters away, where only one standing person fits. The "kitchen" is also outside, a fireplace or a mud oven, and a table under the shade of a tree. Fills out the arid picture, the people sitting outside, the kids playing, many barefoot, chickens, and scrawny dogs. (Fieldnotes, Chaco, 8/1/11)

As I have described in chapter 3, rural populations are the ones most directly affected by the negative consequences of GM soy expansion, either because they are being displaced, losing their land, their job and their income source, or because they are

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120 Interview, Chaco, August 2011.
121 Interview with local chief (jefe) of the Ministry of Social Development, Ministerio de Acción Social, Chaco, August 2011.
being sprayed with agrochemicals. Other neighbors living in cities' peripheries bordering soy farms also suffer from pesticide spraying and have also organized. From these rural and periurban populations, two types of anti-GM soy social movements have emerged:

(1) *Anti-GM/neoliberalism*: The movements of campesino and indigenous peoples, mostly in the north of the country, who contest GM as part of a broader struggle against neoliberal globalization; and (2) *Anti-spraying*: citizen assemblies, mostly in the Pampas region, in defense of health and life, after the illnesses that have spread due to agrochemical spraying. These are the main movements against GM soy in Argentina nowadays. This chapter discusses these two types of movements, their main characteristics briefly summarized in Table 2.122

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122 A short note: The campesino, indigenous, and mixed populations in the north of the country are the ones most violently affected by GM soy expansion. While resistance has emerged, it has to be emphasized that not all indigenous peoples are rebellious. In an interview with members of a community of Mocovíes in Chaco, I was surprised and saddened by their seeming resignation to their state of poverty, in a perpetual wait for the government to help them out (Interview, Chaco, August 2011). In most of these towns indigenous people live like outcasts, and town inhabitants look down upon them, calling them *indios vagos*, "lazy indians who don't want to work and prefer to live out of welfare." While other factors are important (which I cannot address in here as they do not directly relate to my argument, i.e., a history of the colonization of the indigenous populations in Argentina), it is important to note, once again, the role of social subsidies and patronage on poor people's demobilization in the north of the country (see chapter 3, Lapegna 2011).
Table 2. Anti-GM Soy Social Movements in Argentina, Major Dimensions of Variation

<table>
<thead>
<tr>
<th></th>
<th>Anti-GM/neoliberalism</th>
<th>Anti-spraying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main actors</td>
<td>Peasants and indigenous</td>
<td>&quot;Citizens,&quot; &quot;Neighbors&quot;: Urban, periurban, and rural inhabitants not living off rural production</td>
</tr>
<tr>
<td>Site of struggle (Ecoregion)</td>
<td>North</td>
<td>Pampas (some in the North, in Chaco in particular)</td>
</tr>
<tr>
<td>Main grievance</td>
<td>Forced and violent evictions. GM as part of a wider struggle against neoliberalism.</td>
<td>Health effects of agro-chemical spraying</td>
</tr>
<tr>
<td>Main goal</td>
<td>That peasant families stay in their land. Control over land and the territory.</td>
<td>&quot;Stop the spraying&quot;: Regulate agrochemical spraying</td>
</tr>
<tr>
<td>Scope</td>
<td>Local, with transnational connections (Vía Campesina)</td>
<td>Local, with some regional and national alliances</td>
</tr>
<tr>
<td>Mechanisms of power to suppress dissent</td>
<td>Overt violence, including murdering of leaders</td>
<td>(1) Making the powerless accountable; (2) Covert and overt (violent) threats and extortion; (3) Co-optation; and (4) Outright (institutionalized) denial</td>
</tr>
</tbody>
</table>

5.2 COSTS & GRIEVANCES OF THE TECHNOLOGY #1: THE NEOLIBERAL MODEL

Most of the campesino and indigenous families in Argentina live in the northwest of the country, in the provinces of Chaco, Santiago del Estero, and Formosa (Domínguez 2009). Many of these families have organized to claim their right to the land, a claim that
has grown louder and stronger with the expansion of GM soy into their territory (Domínguez 2009). In their own words:

We live this, the encroachment of the frontier of the agribusiness, of soy, of GM crops... [It is] a constant threat (una amenaza permanente) to the territories, to the lands of campesino-indigenous communities, environmental pollution from the products of the technological package that come with transgenic crops, the threat to biodiversity, the loss of our seeds, the criminalization of our struggles to defend the territory. (Interview with members of MOCASE-VC, the campesino movement of Santiago del Estero, Santiago del Estero, August 2011.)

The demands of campesino and indigenous families against GM are inscribed within a broader claim to their land and territory. It is a struggle for the control of natural resources that takes place within the context of neoliberal globalization (Domínguez 2009; Giarracca 2007). The struggle for land goes along the emergence of the campesino-indigenous identity and the organization as a campesino-indigenous movement (Domínguez 2009; Teubal 2009).

The Movimiento Campesino de Santiago del Estero (MOCASE), the peasant movement of Santiago del Estero, is the most important and exemplary peasant movement in Argentina (Barbetta 2005; Domínguez 2009). Peasant organization in Santiago del Estero starts in the late 1970s, in order to defend from forced evictions by agribusinesses, the first implementations of neoliberal policies in Argentina (see Barbetta 2005). In this context, the struggle for land ownership is at the core of MOCASE's struggle, a claim protected under the Ley veinteañal, a law that concedes property rights to anyone that has lived and worked on a territory for 20 years or more (Barbetta 2005:424). In the 1990s, in the midst of Argentina's neoliberal restructuring, the peasant movement in Santiago del Estero organizes as MOCASE. In 2003, the movement splits into MOCASE/PSA, a faction closer to the government, and MOCASE-VC, allied with
the transnational peasant movement Vía Campesina (Barbetta 2005; Domínguez 2009). MOCASE-VC is now comprised of over 9,000 campesino and indigenous families in Santiago del Estero. I met and interviewed some of their members at their headquarters in the town of Quimili, in Santiago del Estero, in August 2011.

*La Lucha por la Tierra: The Struggle over Land*

The main conflict that arises for indigenous and peasant populations in the north is the expansion of the frontier of GM soy into their territories. As described in chapter 3, the expansion of the frontier means *desmontes*, deforestation (the forest as home of biodiversity, their means of living, the forest as a commons, and as part of their identity and culture) as well as forced, violent, evictions. In the interview, MOCASE-VC members told me about forced evictions: bulldozers bringing down homes, paramilitary-like forces threatening and even murdering *compañeros*; Cristian Ferreyra among them. Therefore, their main goal is: *Que las familias se queden en su tierra,* "that families stay in their land."

It is, overall, a struggle over land. A struggle that is framed as part of a wider struggle, against the "extractivist model" of globalized capitalism. The struggle against GM is not a specific goal, but part of the struggle, as they consider GM biotechnology as "the tip of the iceberg," the mere "gear of an economic model." As such, they also denounce and contest other aspects of this economic model based on natural resource extraction besides agribusinesses incursions, such as mining. The struggle over natural

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124 Interview MOCASE-VC, op. cit.
resources is inscribed within the claim of their right to identity, dignity, and sovereignty: 
*Nos arrebatan la tierra y la identidad,* "They take from us our land and our identity."\textsuperscript{125}

In consequence, their actions commit to a different agrarian model than the one proposed/imposed by agribusinesses: Agrarian practices based on culture and traditions, agroecological methods that employ *semillas criollas*, non-GM native seeds, and the pursuit of several projects that create and promote a radically different way of production and relationship between people and the environment: family agriculture (with an emphasis on families staying in their land) and a network of goods' manufacturing and commercialization organized as *micro-emprendimientos comunitarios*, community micro-enterprises, owned and run by MOCASE-VC members, which include a factory of regional products made of peasant production (jams, honey, *dulce de leche*, cheese, wool, etc.), fair trade alternative distribution networks, and a focus on education: a radio and an agroecology school, and a campesino university in the making.\textsuperscript{126}

5.3 \textbf{COSTS & GRIEVANCES OF THE TECHNOLOGY #2: GLYPHOSATE}

The most widely used agrochemical in Argentina and around the world is the herbicide glyphosate, used in conjunction with glyphosate-resistant GM soy (GRR, Grupo de Reflexión Rural 2009:11). Monsanto developed glyphosate in the 1970s and then commercialized it under the 'Roundup' trademark.\textsuperscript{127} Glyphosate is a broad-spectrum herbicide used in conjunction with GM RR seeds and no-tillage machinery (the 'technological package'), preferred by farmers due to its simplicity in use (as it replaces a

\textsuperscript{125} Interview MOCASE-VC, op. cit.
\textsuperscript{126} Op. cit.
\textsuperscript{127} http://en.wikipedia.org/wiki/Glyphosate
gamut of agrochemicals) and its cheaper price. As shown in the figure below (Fig. 3), the increase in the use of glyphosate has gone hand in hand with the expansion of no-tillage practices, an increase considered by GM supporters as "environmentally friendly" as it has implied a reduction in more toxic herbicides, like atrazine (Trigo 2011:37). Critics, however, claim that glyphosate poses a serious threat to public health and the environment (see chapters 2 & 3). As described in chapter 3, despite an initial reduction on the number of agrochemicals used, over time, due to an increase in the area under production and the emergence of glyphosate-resistant weeds growing under monocultures, the amount of glyphosate sprayed has massively increased (see Fig. 3). In 2010, close to 180 million liters (over 47.5 million gallons) of glyphosate were sprayed over 22 million hectares of GM crops in Argentina (Trigo 2011: 35, 4; see Fig. 3). Moreover, critics point out that glyphosate is used alongside other more toxic agrochemicals, such as 2,4-D (a fungicide) and endosulfan (an insecticide) (GRR 2009:12).

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128 Interview with member of Colegio Agroquímicos de Córdoba. August 2011.
In Argentina, glyphosate is classified under Class IV toxicity, where in a scale of I to IV, IV represents minimum risk and toxicity,\(^\text{129}\) a product that normally poses no threat, *Producto que normalmente no ofrece peligro*, as the Roundup label for the Argentine market indicates.\(^\text{130}\) Label warnings also include a color stripe for product safety handling and use, in a color code where red (Class I) means highly toxic and requires extreme precaution (including a death warning represented by a skull and crossbones sign), going through yellow, blue, and green as warning levels and toxicity.


\(^{130}\) Label for Roundup commercialized in Argentina (approved by SENASA) http://www.monsanto.com/global/ar/productos/documents/roundup.pdf
decrease. For Roundup sold in Argentina, the label shows a green stripe with the word CUIDADO, CAUTION, the minimum caution measures required for handling and use.

According to SENASA, the National Service of Sanitation and Food Quality in charge for agrochemical control use and regulation, Roundup glyphosate, if used as suggested—i.e., under phytosanitary guidelines and the expert agronomist advice—, poses no threat to living beings or the environment. As stated in the label approved by SENASA, Roundup is rapidly inactivated in contact with the ground and has no residual effect; therefore, it implies low environmental risk: Roundup "does not accumulate in animal tissue," it is "practically not toxic to birds," "virtually nontoxic to bees," "moderately toxic to fish and aquatic organisms," "leaves no residue" in the soil, "pollution of water streams is unlikely," etc.

Much to the contrary, experts and lay people alike, in Argentina and around the world, challenge Roundup's 'low toxicity' classification (Antoniou et al. 2011; Antoniou, Robinson, and Fagan 2012; Arancibia 2013; Small Planet Institute 2012). Challenges arise on several grounds, most significantly on the politics of regulation and of scientific expertise. Critics ask, among other questions, how did Roundup get approved in the first place? On what basis? Which scientific studies were taken into consideration and which

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134 As such, Roundup appears to be less harmful to people and the environment than bleach or any other common household chemicals. Early on, soy supporters spoke about glyphosate as totally harmless, up to the point of saying, "it's like water" or "I would give it to drink to my own children." This early stage, of total denial of the negative effects of glyphosate, while it is not totally over yet, it has given way to a new position of the pro-soy people, that of the buenas prácticas, best practices (i.e., so that glyphosate is harmless if used accordingly to procedure). I explain this further later on.
ones were ignored? Which studies were funded for research and which ones were not? As discussed in chapter 2, these questions go straight to the question of power and the social basis of technological change.

In Argentina, SENASA is the national entity in charge of regulating agrochemical use. SENASA first approved glyphosate in 1977, revalidating approval consecutively in 1992 and 2011 (Arancibia 2013:5). The latest SENASA's agrochemical/phytosanitary regulation was passed in June 2012, the Resolution 302/2012, which is based on World Health Organization (WHO) and EPA standards (Pina 2012:17). Roundup glyphosate has been certified and approved by SENASA as a "product that normally poses no threat" also following WHO, EPA, and FAO standards. The key issue here is that SENASA did not run its own studies on safety and impact of glyphosate use but rather based its decision on what these other organizations have previously decided (Arancibia 2013). This is a particularly questionable as WHO and EPA standards for Roundup are already highly contested: Critics uphold scientific evidence that shows links between illnesses and glyphosate spraying and claim that these studies have been systematically ignored and denied by regulators (Antoniou et al. 2011; Arancibia 2013). The studies run by the research teams of Séralini in France (Séralini et al. 2012) and Carrasco's in Argentina (Paganelli et al. 2010) are among the most widely cited by critics (Antoniou et al. 2011; Antoniou, Robinson, and Fagan 2012; Arancibia 2013; Small Planet Institute 2012).

135 Servicio Nacional de Sanidad y Calidad Agroalimentaria. Its parallel institution in the US is the FDA but, for agrochemical regulation, it is the EPA.
137 Among other reasons, because of lobbying pressures. (see also Kloppenburg 2005).
Why does SENASA then choose to follow international standards and avoid questioning glyphosate toxicity? To answer this question it is necessary to recall the connection between glyphosate and GM soy, and in consequence and most important, the workings of power behind GM soy expansion. Glyphosate is part and parcel of the technological package of GM soy; therefore, support and promotion of GM biotechnology and of glyphosate by the corporate-state power alliance go hand by hand. The passing of regulation that approves Roundup as non-toxic allows for the indiscriminate use of glyphosate (and the expansion of GM monocultures) while at the same time builds in the all-benefits narrative of GM biotechnology that creates consensus and quiescence (see chapter 4), as allegedly glyphosate in conjunction with no-tillage creates a "virtuous cycle" and "environmental sustainability" (see Trigo 2011 above). Moreover, it is important to highlight the significance of the agrochemical market for the corporate sector: glyphosate and other agrochemicals is a highly lucrative business. In 2012, the agrochemical market in Argentina rose to $2.4 billion US dollars.\(^{138}\) Herbicides represented the largest share of the market (64%) with glyphosate scoring the highest sales, US$593 million (accounting for 61% of herbicide market and 39% of the total agrochemical market). Monsanto, with Roundup, holds the largest share of the glyphosate market in Argentina.\(^{139}\) This is most important as Monsanto does not have patent rights to seeds in Argentina and thus does not profit directly from seed sales (see chapter 4).

Glyphosate came under close public scrutiny in the midst of the *Conflicto del Campo*, the conflict over export taxes between soy producers and the government.


\(^{139}\) "Los cables utilizados," *Página/12*, March 9, 2011.
described in chapter 4. Until then, the struggles of fumigated peoples remained mostly unheard by national media coverage. In the momentary break of the pro-soy corporate-state alliance, the negative consequences of soy-monoculture expansion broke in the media by the hand of glyphosate spraying. In January 2009, Página/12, the most popular newspaper after the corporate-controlled Clarín and La Nación, started a series of high-pitched articles focused on the ill effects of glyphosate, opening with a full frame front page color picture showing an airplane spraying a farm, entitled, in huge captions, "POISON." As a follow up, a few months later Página/12 published breakthrough findings on glyphosate effects by a team of Argentine scientists at the Molecular Embriology Lab at the University of Buenos Aires, led by Dr. Andrés Carrasco (Aranda 2009). This study, the first of its kind at local level, refuted Roundup's alleged low toxicity as it found that glyphosate is toxic on embryos—even at lower doses than used in agriculture—, producing malformations and neural, intestinal, and heart disorders (Paganelli et al. 2010)

It is important to note that Página/12 is the pro-government newspaper, and so in the midst of the campo-gobierno conflict over export taxes this sudden appearance in the media of soy as a public problem can be seen, as Arancibia (2013) argues, as a threat to soy producers. It certainly was, and the government strategy did not go unnoticed: it fueled strong reaction by powerful groups, most significantly Monsanto and its ally, the government of the United States. A USDA report leaked by Wikileaks warns of

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140 As discussed in chapter 4, showing the use of discursive power to create consent by suppressing public participation that could create dissent.

141 The full title was La Mancha Venenosa, literally "The Poisonous Stain;" here also a word play with a kids' game where the goal is to run away from the one that is the mancha, who has to spread (spray) out his "poison" to the other kids. Thus, the one that gets touched loses the game. Front Page, Página/12, January 12, 2009.
“the pro-government press (...) waging a campaign against the use of glyphosate (...) which appears to be driven more by local politics than health concerns." The USDA claims that Carrasco's findings are "unverified" and that in general the "alleged study does not have scientific credibility;" and so proceeded, through the US Embassy in Buenos Aires, to provide SENASA "information on studies conducted on glyphosate." SENASA did not request these studies, run by Monsanto, which are undoubtedly aimed at proving Carrasco wrong and endorsing Roundup's low toxicity. The USDA main goal, nakedly exposed by this wikileaks, is to protect Monsanto and its "Moneymaking" Roundup from the Argentine government attacks. Thus exposing as well corporate lobbying as a mechanism of power (see chapter 4).

Regulation over glyphosate spraying is highly contested and nowadays the most visible and successful aspect of GM soy contestation in Argentina. The first ones to organize against glyphosate spraying were a group of mothers living in the outskirts of the capital city of Córdoba, in the neighborhood Ituzaingó Anexo. Their struggle is what I turn to next.

The Mothers of Barrio Ituzaingó Anexo, Córdoba

In our case, human rights have been violated so what we are demanding is for our right to health, to life, and to a healthy environment, which is, if you think about it, a right everyone should have, but we don't have it right now. The right to life is untransferable, thus violating this right, which is a human right, harms all (hace mal a todo); they have trampled on what's most sacred to people (han pisoteado lo más sagrado de una persona). They've sprayed us from airplanes, they didn't care about people, no one cared to say: Don't [spray there], there's a neighborhood nearby... No, if people didn't come out, if we didn't come out to fight, they would be still doing the same. They stopped because we fought. We organized first

because we had to defend from something that was harming us (defendernos de algo que nos estaba dañando).
Mother of Barrio Ituzaingó, qtd. in Carrizo and Berger (2009:13), my translation.

The Mothers of Barrio Ituzaingó Anexo were the first ones to denounce, protest, and organize around glyphosate spraying in Argentina.\textsuperscript{144} Ituzaingó Anexo is a working-class neighborhood in the industrial outskirts of the capital city of Córdoba, a neighborhood surrounded by soy farms. The struggle of the Mothers starts in late 2001, with noticing that many in their neighborhood were sick and dying. Then, in a neighborhood of 5,000, the Mothers surveyed over 200 cases of cancer, as well as other respiratory and skin diseases, miscarriages, and malformation in newborns (Carrizo and Berger 2009; Carrizo and Berger 2012). Among the sick and dying, or rather in particular, were their own children and family members. Sofía Gatica, one of the founding members of the Mothers, lost her baby daughter in 2002 after a kidney failure. Determined to find out "what killed her children," Gatica with other 16 working-class mothers with no organizing experience founded the Mothers of Barrio Ituzaingó, and started the long road to prove the links between agrochemical spraying and the poisoning of their community.\textsuperscript{145}

\textsuperscript{144} Interview with Cecilia Carrizo and Mauricio Berger, researchers at the Universidad Nacional de Córdoba. Córdoba, August 2011.
\textsuperscript{145} http://www.goldmanprize.org/recipient/sofia-gatica. For her activism with the Mothers of Barrio Ituzaingó, Sofía Gatica was later awarded the Goldman Environmental Prize, the World's Largest Prize Honoring Grassroots Environmentalists (in Sept. 2012). This story did not have much repercussion in mainstream Argentine media.
The first steps the Mothers took were to talk to other neighbors, to find out if others were going through the same and to raise awareness. Denouncing is the first step they take: to denounce the spraying with agrochemicals over their neighborhood, the spraying with agrotóxicos, agrotoxics, as they start to name them. Their repertoire/means of protests includes blockading routes (piquetes) and rallies/marches downtown, bringing their sick children with them to show everyone the very real negative effects of agrochemical spraying on health, and meeting with other neighbors from communities similarly affected, like from Monte Cristo and Colonia Caroya (also in the Córdoba province). The Mothers also meet with members of the city council and the mayor, and demand enforcement of local ordinances and regulations on agrochemical spraying. With these actions, the Mothers' demands start to be heard and the issue starts to become visible.

At the same time, and core of their struggle, lied the hard task of showing the links between the diseases and agrochemicals. The first lab results came out in 2002, showing evidence of endosulfan in the water supply. The Mothers also start surveying the neighborhood and mapping the sick, the map showing an unusually high number of pathologies –such as anemia, lymphoma, leukemia, and cancer– clustered in only a few blocks. This becomes el mapa de la muerte, "the map of death" (Berger and Ortega 2010:133). In response to the Mothers' claims, the provincial Ministry of Health sends out a commission to carry out an epidemiological survey, which confirms the Mothers' demands.

146 But not with the neighbors that are rural employees, explains Berger (in interview, op.cit.)
147 Interview with Carrizo and Berger, op.cit.
148 Besides agrochemical spraying, these studies also found pollutants resulting from industrial waste (automobile plants) and PCB from the local electric power plant (Carrizo and Berger 2009).
findings. Yet, despite these results and of further testing commissioned by the Ministry of Health of the Córdoba Province, which also prove the existence of agrochemical residues in soil, water, and air, the Ministry's report from 2004 concludes that the amount of pollutants are within normal levels (Berger and Ortega 2010, Carrizo and Berger 2009).

Hence, despite their findings, the authorities denied the existence of a relationship between illnesses and agrochemical sprayings. Moreover, since the beginning, they put the Mothers to show that agrochemicals conclusively damage health, placing the burden of proof on them, on the powerless. Cecilia Carrizo and Mauricio Berger, researchers at the National University of Córdoba, identify this early first stage of the Mothers' struggle as "negatory", of total denial. Authorities halted all discussions based on the demonstration of causality: Can studies conclusively and ultimately demonstrate a causal relationship between cancer and glyphosate? From the start, the answer is no, as cancer (or any human illness) is caused by multiple factors that cannot be controlled as in a lab experiment. The question is why are the powerless forced to prove what harms them, compared to the powerful having to prove their activities are utterly harmless? (see Brown and Mikkelsen 1990; McCormick 2009). Carrizo and Berger conclude that while this first stage of authorities' denial of the links between agrochemicals and illnesses is not totally overcome yet, since Carrasco's findings were published in Página/12 (which opened up media discussion and made the problem visible), there has been a shift in the authorities' discourse, which is now based on the notion of "best practices," i.e., glyphosate is harmless if used according to specified procedure. This slight change in the

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149 Interview with Carrizo and Berger, op. cit.
150 What has to be questioned therefore is not the "failure" of lab experiments but rather the inability of labs to reproduce human living conditions (and thus the notion that causality can be demonstrated with lab studies).
hegemonic discourse is also the result of the Mothers' struggles and efforts to build what Arancibia (2013:7) identifies as a "popular epidemiology," or "counter-hegemonic epidemiological data" (see Brown and Mikkelsen 1990), which, in Arancibia's terms (2013:7), "turned to be an innovative and powerful contentious performance" (Tilly 2008).

The struggles of the Mothers of Ituzaingó Anexo Neighborhood paved the way for other fumigated/sprayed neighbors to organize in defense of health and life. The campaign Stop the Spraying is born from these demands.

**Paren de Fumigar, Stop Spraying**

In 2006, in solidarity with the struggle of the Mothers of Barrio Ituzaingó, a Buenos Aires-based group of academics and activists named Grupo de Reflexión Rural (GRR) organizes a campaign against agrochemical spraying¹⁵¹ (GRR, Grupo de Reflexión Rural 2009). This campaign is known as Paren de Fumigar, Stop Spraying, and it is summarized in the report Pueblos Fumigados, Sprayed Peoples/Towns, published in 2009, which gathers the experiences and demands brought forward by affected neighbors from the largest soy provinces in the Pampas region, Córdoba, Santa Fe, and Buenos Aires (GRR 2009). With this campaign, GRR helped to organize and make visible what neighbors have been suffering since early on (the introduction of GM) but were scattered in their demand. GRR's campaign helped to survey the fumigated towns and organize them under one umbrella, coordinating efforts and resources, and

¹⁵¹ The campaign is coordinated by the Mothers of Ituzaingó Anexo in the Córdoba province, by GRR in Buenos Aires, and by CeProNat (Centro de Protección a la Naturaleza) in the province of Santa Fe.
then helping to visibilize how large and spread out the problem was (and later on, to spread the issue—as a social problem— to other towns).¹⁵² In 2008 there was a meeting, an Encuentro, in Colonia Caroya, Córdoba, another sprayed soy town, which members of Paren Córdoba identify as a key moment in the struggle, when the GRR-coordinated campaign turned into a collective of different chapters, which, in each of the three provinces takes a slightly different characteristics (including, in Santa Fe, a slight change of name: Paren de Fumigarnos, Stop Spraying Us). While there are exchanges between groups and assemblies (by email, list-serves, regular meetings) until now there is no national network in place. There are, however, alliances with other groups organizing around socio-environmental struggles under the Union of Citizen Assemblies (UAC) umbrella.¹⁵³

People organizing in Sprayed Towns are all over the country where soy fields abound (however, not every soy town hasseen contestation emerge, most have been quiescent). Besides the Mothers in Córdoba's capital city, there are neighbors organizing against glyphosate spraying in several rural towns in the provinces of Córdoba, Santa Fe, Entre Ríos, and Buenos Aires (GRR 2009). In the northeast of the country, protest has been strong in the province of Chaco, in particular in the towns of La Leonesa and Las Palmas, where a group of neighbors have organized to protest against glyphosate spraying used in the adjacent rice fields.¹⁵⁴

In contrast to peasant and campesino movements, members of Paren are not rural workers or farmers, and even though many are rural inhabitants and live by a farm, they

¹⁵² Interview members Paren de Fumigar Córdoba; Córdoba, August 2011.
¹⁵⁴ Interview with members of neighbors' environmental assembly in La Leonesa, Chaco, August 2011.
typically do not profit directly from rural production. In my interviews, I met teachers, students, lawyers, medical doctors, housewives, and service-sector employees. They self-identify as vecinos, plain neighbors, who are auto-convocados, self-organized in defense of health and life, a strong statement aimed to distinguish themselves from political parties or affiliations and to come out as unconcerned about any other interest but the defense of their children's health.

La Lucha por la Salud y la Vida: The Struggle over Health and Life

Discussion at Paren assemblies is typically limited to agrochemical use and spraying. Spraying is highly problematic, as farms stand usually right across the street from where the town ends. Thus it happens often that producers fumigate within town limits. It is truly striking to visit rural towns and to see people having a soy farm as their backyard, but it happens often. Despite Roundup advocates' claims, spraying is highly volatile and difficult to control, in particular when sprayed from airplanes. Chemical clouds thus spread over the town when the wind blows towards the village. Besides spraying, neighbors also point at agrochemical pollution that results from storing (fumigated) grain in silos built inside town (the silos need to be ventilated to maintain dry grain, thus when fans are on, chemical fumes arise) and of mosquitos, the machines used for terrestrial fumigations, which contractors park inside town, leaking their poison into town.

155 Interview with members Paren Córdoba, Asamblea La Leonesa, rural inhabitants in general (even those that do not identify fumigations as a real problem).
156 As I described in the last chapter, it was even more striking to see how many newly rich soy producers built fancy chalets by the soy farm, showing how little awareness there is over glyphosate spraying.
In their struggle to defend health and life, the main demand neighbor assemblies have is to regulate agrochemical use. They thus look for ordinances and laws that could protect them, regulating agrochemical use within town limits. The right to a healthy environment is protected by the Constitution (article 41) and thus the basis of most claims. There are also in place scattered municipal ordinances and provincial laws that regulate the distance of fumigations (i.e. establishing how far from town fumigations can begin, generally 500 meters for terrestrial spraying and 1500 meters—a bit less than a mile—for aerial fumigations) and the requirement to keep a row of vegetation surrounding the farm that works as a "curtain" for spraying. However, until now there is no law in place that regulates agrochemical fumigations at the national level. Many of these ordinances were already in place when the Mothers of Ituzaingó began their struggle.\(^{157}\)

The main problem then, and now, is related to the enforcement of existing laws. This is due to two important problems: One, to the inability of the competent authorities to fulfill their duty, which is sometimes related to scarcity of resources (money to pay wages, knowledgeable people); and two, to the unwillingness of producers to comply with the law (which of course they can afford to do because they are not sanctioned in any way, which hints at the complicity of the local institution in charge of law compliance).\(^{158}\)

Specific events of fumigations that did not comply with the law were used by the Mothers of Ituzaingó and Fumigated Neighbors as cases for the first trials against soy farmers and fumigation contractors: In December 2009, the Mothers of Barrio Ituzaingó Anexo, in March 2010, in San Jorge (Santa Fe), and in June same year, in La Leonesa and Las Palmas (Chaco), Sprayed Peoples won their case—banning agrochemical


spraying within a distance and establishing criminal charges to offenders—, and thus becoming icons of the struggle.  

It is important to emphasize that while limited in their demands, especially compared to the radical claims of campesino and indigenous people, there is a strategy behind them. In interviews, Paren members acknowledge to be highly aware that soy producers are part of their community; and so, as one of them told me, "you can't just go out saying, "Hey, you're killing me!" These are your neighbors!" This would generate a level of conflict that a small rural town may not tolerate (particularly when the goal is not a radical transformation but a negotiation of boundaries among neighbors). Moreover, and also very important, they are highly aware that soy production has been a panacea for the village. As another Paren member told me, "the neighbors see el campo as progress, everyone is so comfortable with soy production, they don't see anything wrong there. On the contrary." How to make the problem visible is thus a hard task for activists, in particular in towns that depend solely on agricultural production. According to Paren members, the task is easier in places when there is another type of industry or production in place, such as in Buenos Aires where there are factories, or in towns that live off tourism, thus confirming other scholars' findings on how dependence on a single local

159 While these trials' ruling/decision establish only local regulations (nothing at provincial or national level), they have been an important and successful step in the struggle as they set a precedent in subsequent similar cases (see Arancibia 2013).

160 Differences arise, however, when soy producers do not live in town. Thus, for example, one Paren member told me of an event in a neighboring town, where the producer escorted the contractor in charge of fumigations with paid guards/private security, and in consequence asserted, "they (producers) could never do that in our town, they live here." It seems as if the further the distance soy producers are from the farm, the harshest the violence they are capable to employ to suppress mobilization. (In Santiago del Estero they send paramilitary forces).
industry is a deterrent/factor non conducive to mobilization (Crenson 1971; Gaventa 1980; Gould 1993; Gould 1991).

**Power-Launched Counter-Offensive**

Anti-fumigation struggles have been highly successful, in particular considering that they are facing very powerful opponents. The main outcomes of these struggles have been the building of epidemiological data that shows the links between illnesses and fumigations, the passing of regulation that bans fumigations within town limits (for some towns), and the creation of a national advocacy network of lay people and experts (see Arancibia 2013). Their main success has been to make glyphosate visible, to make agrochemical spraying a social problem. So that now, as I went out interviewing soy producers, questions over glyphosate and fumigation inevitably brought up a tense moment in the interview. On a broader level it brought up the discourse of 'best practices' in the aim to modify the hegemonic discourse on the benefits of GM biotechnology.

That said, despite these successes, fumigations continue and people continue to be sprayed with glyphosate, 2,4-D, atrazine, endosulfan, and other poisonous agrochemicals. As praiseworthy and urgent their call is, the call to protect health and life, these groups are not getting the voicing they deserve. This is because this is a highly unequal power struggle. The powerful have not remained passive to anti-fumigation struggles, but rather have used all means and strategies possible to silence them. I have identified the following mechanisms of power to suppress dissent: (1) making the powerless accountable; (2) covert and overt (violent) threats and extortion; (3) co-optation; and (4) outright (institutionalized) denial.
First, a very effective way to suppress contestation is to make the powerless accountable: they are housewives and teachers, with sick children, the ones that have been forced to show the links between the illnesses and fumigations (compared to requesting that multinational corporations fully test the socio-environmental consequences of the new technology). In their struggle, lay people had been forced to become experts on the topic, having to learn, on their own, everything about agrochemicals, PCB, dioxins, testing on embryos, and other chemical, biological, and health aspects of fumigations, as well as on its legal aspects, about ordinances, laws, and due process. This long learning process had to take place while waiting in town halls and ministries for public employees to listen to their demands, rallying and spreading the word in the community, while at the same time working and supporting the family, financially and emotionally, even though some family members are sick or dead. These intellectual, emotional, and physical demands are a heavy strain that bring many down (see Brown and Mikkelsen 1990; Levine 1982).

Activists also claim to have undergone all kinds of threats, directed to them and to their family members. The Mothers of Barrio Ituzaingó claim that early in their struggle they were dismissed as locas, as crazy, irrational women. This same strategy was used to silence the Mothers of Plaza de Mayo (see Navarro 2001), and it is a common strategy of power to silence women in cases of environmental health conflicts, as they are usually the ones who start and lead these movements (see Krauss 1993; Levine 1982). The Mothers have also been threatened and intimidated (Carrizo and Berger 2012). In La Leonesa, Chaco, neighbor-activists also told me they have been threatened, i.e., with losing their job, as well as their children being insulted in school. They also reported that
some assembly meetings have been violently disrupted, and recall in particular the visit of scientist Dr. Andrés Carrasco, in August 2010, whom they had invited to share with the community his findings on the health effects of Roundup. Right before the meeting, Carrasco and his colleagues were violently attacked by a group of people identified as public (town hall) employees and employees from the rice firm.¹⁶¹ This violent attack made it to the national media thanks to a video uploaded in YouTube and stories run in the newspaper Página/12.¹⁶²

Other means to silence aggrieved peoples have been trying to co-opt them, a strategy widely used by the State. The Mothers claim to have been offered positions in office (puestos políticos) to silence them.¹⁶³ Most important and most widespread has been the strategic allocation of Planes, the cash-transfer social subsidies, to create quiescence, either by the promise of handing out or by threats of withdrawing, both of which show the strategic use of subsidies by local politicians, as by rule welfare is based on need and status (i.e., unemployment) and thus should not be earned or lost based on the whim of local politicians. They are, however; and networks of patronage and clientelism have been identified as the cause for demobilization and quiescence among the poorest in the north of the country (Lapegna 2011).

Last but not least among the mechanisms of power to suffocate contestation has been the putting out of a massive, widespread, denial campaign by the State and its institutions (some times in alliance with corporations, but these weren't supposed to protect citizens in the first place). CONICET, the National Scientific Research Council,

¹⁶¹ Interview with members of neighbors' environmental assembly in La Leonesa, Chaco, August 2011.
¹⁶² Aranda, Darío, "Censura y Presiones," Página/12, August 17, 2010
at the time that Dr. Andrés Carrasco presented his study on glyphosate, came out publicly to disqualify him and his findings, and he was close to being fired from his post (Arancibia 2013; Aranda 2010; Verbitsky 2009). INTA, the National Institute of Agrarian Technology, another state-funded institution, is one of the main promoters of GM biotechnology and glyphosate (see chapter 4). As described above, SENASA, the National Service of Sanitation and Food Quality in charge of agrochemical regulation, classifies glyphosate as of lowest toxicity, without further proof and allegedly pressured by Monsanto. Moreover, SENASA is also in charge of controlling and enforcing agrochemical regulation that controls fumigations, a task that, after an audit by the Auditoría General de la Nación, the Government Accountability Office, is shown that the entity has completely failed to achieve.  

In an interview for the international news network Al Jazeera, the Minister of Agriculture, Norberto Yahuar summarizes the government official attitude towards the claims of sprayed peoples: Total denial. In his own words:

We don't place our population at risk. Argentina has some of the world's most stringent environmental safeguards thanks to strict restrictions on fertilizers and pesticides.

In 2009, in the midst of the Conflicto del Campo and the Página/12 stories on glyphosate, President Cristina Fernández proudly announced the creation of a Commission on Agrochemicals under the supervision of the Ministry of Health

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(Comisión Nacional de Investigación sobre Agroquímicos del Ministerio de Salud) to investigate the links between glyphosate spraying and health. At the time widely celebrated as a success in the Sprayed Peoples struggle, in November 2009, the Commission strikingly concludes that there is "not enough data on the effects of glyphosate on human health in Argentina" (qtd. Arancibia 2013: 10). In 2012, right at the same time the Mothers of Ituzaingó celebrate winning their trial against soy producers, Ms. Fernández announces that Monsanto has been granted permission to build one of the largest GM corn seed factories in the world. It will stand in Malvinas Argentinas, a rural town 20 miles away the capital city of Córdoba, home of the Mothers of Ituzaingó and their struggle.

These events exemplify the mixed results of the struggle: the conflicto del campo has opened a window of opportunity for social movements, which was successful enough to push political power for change. However, as described chapters 3 and 4, political power is committed to the GM soy model, so that for every win, it retaliated with stronger force, as exemplified by the permission granted to Monsanto to build the Malvinas Argentinas GM plant. In this case it is clear how the political-economic

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166 “Monsanto invertirá $1.500 millones", La Voz del Interior, June 16, 2012. In its brochure, Monsanto claims that with the new factory, Planta Malvinas Argentinas along with the one already at work in Rojas (province of Buenos Aires), Argentina will have the two largest GM hybrid corn seed plants in the world. Brochure available at http://www.monsanto.com/global/ar/nuestros-compromisos/documents/Planta-Malvinas-Argentinas.pdf
167 In what seems the outmost dismissal of the Mothers' struggle, the president proudly and cheerfully announced the building of the plant, flaunting Monsanto's brochure, extolling the corporation and its plans, Monsanto being the main and most iconic target of anti-GM struggles. This can be seen in the Ms. Kirchner's discourse that announces Monsanto's Malvinas Argentinas plant, in "Bad Seeds", AlJazeera, Op. cit.
structure limits the success of collective action (McAdam 1982; Pellow 2007; Tarrow 2005a).

To conclude this section, and chapter, it is important to note that this power-counter offensive against anti-fumigation movements has not been as directly violent as that inflicted to campesino and indigenous families in the north of the country. As mentioned earlier, peasant and indigenous members of MOCASE-VC denounce forced evictions with bulldozers and the murdering of their leaders. Yes it is true that the Mothers of Barrio Ituzaingó denounce that glyphosate-spraying is a genocidio encubierto, a "genocide in disguise" (see Carrizo and Berger 2012). However, there is a tangible difference between getting your home bulldozed and having a plane fumigating in a nearby farm: while there is no doubt that violence is being inflicted in the first place, in the second case, whether this is a violent act or not is open to doubt (and this doubt arose often in my interviews, for several reasons, from denial to real unawareness of the problem, as I further show in the next chapter). There is a temporal distance between cause and effect, from the moment of the spraying to the agrochemicals slowly building in the body and getting sick. Moreover, for most people being sick is understood as a personal problem (i.e., the consequence of genetics or poor diet) and thus showing the links between environmental pollution and disease most times requires an "expert approval," the scientific testing of agrochemicals' negative impact on health (McCormick 2009).

There is also a relationship between the level of violence that can be inflicted on populations and the physical distance of the producers: i.e., the farther soy producers are

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168 This is why it is so important for environmental health movements to build scientific evidence on the links between pollutants and illnesses (Brown and Mikkelsen 1990, Levine 1982, McCormick 2009)
from their farms (physically), the farther they are emotionally and psychologically of the consequences of their decisions (Gould 2010; Gould 2006). Thus, it is easy for them not to care, or to care less, just because they do not have to live with the consequences of their acts; compared to soy producers who live in the village and share in the everyday life with their sprayed neighbors, and their own family members. As one Paren member told me, "they wouldn't do this to their own children."

In a sense, the most effective way to suppress dissent and create quiescence is straight, outright violence: the first dimension of power (Lukes 2005). However, this has important drawbacks for political power in a democratic society, which needs hegemony and consent to be sustained. Thus, the government can't just go out murdering people (at least, not overtly); while at the same time, when opposition grows, it has to provide avenues for citizens to express dissent as well as to show that it is responsive to citizens' demands. The creation of the Commission of Agrochemicals and the allowing for the trials to GM soy producers described above are good examples of these. A negotiation thus can be achieved between the government and aggrieved citizens, that in practice could satisfy all: regulate spraying with "best practices" and set up a commonly agreed distance from town to start fumigations. In that manner, fumigated peoples can get what they ask for while the GM soy model can remain intact (and thus not threatening the economic interests of the corporate-state elites). Now, with campesino and indigenous peoples, it is a whole different story. With them, there is less interest in negotiating consent: either consent is easily achieved through patronage and clientelism (votes are won with social subsidies) or dissent is violently suppressed. Campesino and indigenous movements like MOCASE-VC are truly restive populations who represent a real threat to
the agro-export model of GM soy in particular, and to the extractivist neoliberal economic model in general. It is also important to note that, compared to these historically relegated and oppressed campesino and indigenous peoples, the movements of sprayed neighbors have access to resources and so they aren't as powerless. These are white people, many educated and professionals, students, teachers, medical doctors, lawyers, journalists, who have access to resources that help the movement grow (McCarthy and Zald 1977).
CHAPTER 6. LATENT GRIEVANCES

As I have shown in the last chapter, there is some limited contestation around GM issues in Argentina. However, even if growing and important in their demands, these movements are a minority and do not have much visibility in national media. In broader terms, as I described in chapter 4, there is support and adoption, quiescence overall. Nonetheless, that there are no apparent or aired grievances among the population (and thus quiescence) does not mean that no grievances exist at and that a shared sense of justice reigns. In this chapter I show that in the zona núcleo, the Pampas' core of GM soy, latent—underlying, unexpressed, veiled—grievances exist, in particular around the health hazards of agrochemical use. These latent grievances hint at a conflict of interests between the powerful and their subjects, the potential for conflict that reveals the third dimension of power at work (Lukes 2005).

6.1 LATENT GRIEVANCES IN THE PAMPAS: HEALTH HAZARDS OF GM SOY PRODUCTION

Agrochemicals and glyphosate in particular were a touchy topic all across my fieldwork. In almost every interview or informal chat I had with rural producers and inhabitants, I noticed a tension every time the word "glyphosate" was mentioned. Those on the promotion side of GM soy found different ways to discard and/or find a roundabout in conversation (i.e., from saying that glyphosate is innocuous to health when applying best agronomical practices to just plain dropping the issue out of conversation). Many rural inhabitants not profiting directly from GM soy production were, strikingly,
doing the same. On my side, because of my research, I was well aware of the health and environmental hazards of agrochemical spraying. I was also well aware that glyphosate had been recently a prominent topic in the media (see chapter 4). Why was everyone avoiding an issue that needed urgent discussion? In the Pampas, the health hazards of GM soy production seemed to have become the "elephant in the room," the big fat issue that could not be missed yet no one dared to address (see Zerubavel 2006).

Data for this chapter comes from observations from a rural town located in the north of the Buenos Aires province, in the heart of the zona núcleo of soy, in February 2012. I will call it General Artigas. This is one of the many booming rural towns in the Argentine Pampas that have benefited from GM soy production. These are charming, beautiful towns, most particularly when compared to the poverty and abandonment of other rural towns. Here, the main square has been recently renovated with new tiles and well-groomed flowerbeds. There is a new private school and the hospital is being renovated. There are newly paved roads, people moving in, and a vibrant construction sector. People enjoy increased revenue from the ag-related sector that spills over town (see chapter 4). As in other Pampas' soy towns, in General Artigas soybeans have replaced other crops and cattle and now soy is grown almost exclusively and to the edge of town. With the soy plants, right outside town also stand the silos of the grain traders, parking lots for tractors and agricultural machinery, and a sizable fertilizer plant. General Artigas is also a typical soy town in that no contestation against GM soy has emerged, neither against GM biotechnology nor around glyphosate spraying. Yet it isn't all soy and roses in General Artigas. To some, agrochemicals are, though in a veiled, covert way, a prominent issue. Here I show how.
The Elephant in the Room: Silence and Denial

A few kilometers away from General Artigas' entrance, scattered among farms, stand the offices and silos of several multinational grain traders and exporters, such as LDC Dreyfus, Bunge, and Cargill. Thanks to Mari, my main informant in this town, I'm interviewing Diego, who works at one of these companies. Diego is a young man in his late twenties; Mari and Diego are relatives. Diego is showing us around and explaining how the company operates. This is from my fieldnotes:

When we're coming out [from the main storing area] passes by a plane, a fumigating plane. I look around: On the left, I see a field of soy. Right across, another one. On the right, there's sunflower. We're surrounded by ag-extensive farming.

So, we're out there. In a split of a second, the plane flies by, I see the soy field, I think: "glyphosate." Diego says, like nothing special, un avión fumigador, a fumigating plane.

So I ask, a bit puzzled:
A: ¿Se fumiga acá? ¿Con avión? People spray here? With planes?
D: Yes, sure.
A: But isn't it prohibited?
At least, that was what I had been told that very morning when interviewing the head of an agribusiness downtown.

Diego, shaking his head and rolling his eyes in disbelief, says, "there might be regulation, but it's not observed (pero no se cumple)." Then, asserting, Se fumiga con avión, "Fumigations are done with airplanes." I'm stunned. Shocked. So I repeat, "But it's right there!!" –trying to make it clear: "This means spraying you on your head!!" Literally it is. The farm stands right across the fence.

There is a moment of silence. Diego shows resignation in his face. Then he adds, in a low voice: "People say that a report came out, that there are malformations..." His voice fades without finishing the sentence. I am now truly shocked, on the verge. Can't tell if it's out of indignation or the realization that I'm facing one key issue of this dissertation.
I snap back:
A: What then?!? ¿i¿i¿i¿Nadie protesta?!?!? No one will protest??!!!!
D: ....... (silence)..... Well....... Es que da mucha plata. It's that it is very profitable.
Diego is now silent. He lowers his head. In the end, I understand, he can't say much. He works for a multinational corporation; and not just any but one of the most powerful in the whole world. He could be fired, to say the least.

In the midst of our awkward silence, Mari steps in: "Well, but cancer... There has always been cancer (Cáncer siempre hubo)... No one knows if it's because of the fumigations, or what."

With her comment, unknowingly—and probably also unwillingly—, Mari acknowledged what the three of us where thinking but never dared to mention, the "elephant in the room" (Zerubavel 2006): the toxic effects on health of agrochemical spraying. The "elephant in the room" is a common expression used to refer to what Zerubavel (2006:2) conceptualizes as a "conspiracy of silence": a tacit agreement among a group of people "to outwardly ignore something of which they are all personally aware." How to miss an elephant standing in the middle of a room? The image is ludicrous and points straight to the fact that avoiding such a conspicuous matter would require a "deliberative effort to refrain from noticing" (Zerubavel 2006:9).

While acts of ignoring, denial, and silencing are individual and thus typically explored by psychologists, they have a social basis (Zerubavel 2006). In his book The Elephant in the Room, Eviatar Zerubavel sets to explore the social aspects of this phenomenon, thus delineating a sociology of silence and denial. Case studies such as Norgaard's (2011) and Auyero and Swistun's (2009) delve further into these issues, as these authors describe and analyze the social basis of subjective experiences and denial of environmental hazards. Through ethnographic accounts, these studies explore how collective denial is expressed through everyday practices and emotions (Auyero and Swistun 2009; Norgaard 2011). They thus show how people frame potential grievances in
a very specific way: by denying their existence; and how, by doing so, they stifle latent grievances that could be source of conflict and mobilization.

**Whispers & Silences: The Women of General Artigas**

It was in the moments of most confidence, when the men had left and it was just I with a few women, when latent grievances emerged. These came out as concerns, worries, and fears, always veiled, covered with a halo of doubt. Yet, it was a striking difference to the "admits-no-doubt-all-benefits" narrative that men had to share with me. In whispers, when no one else seemed to hear, women shared their concerns with me, concerns around agrochemicals and illnesses. These women were particularly concerned about people they know: Their concern thus is very specific, and it is about the health of their neighbors, their relatives, and, most important, the children (theirs and others they know). Most strikingly is that, despite their fears and concerns, these women never seemed to attempt to find out more. Most on the contrary, by the time a doubt was raised, it was almost automatically suffocated, by themselves or other women in the group. This self-policing was performed by denial (Mari's commentary above "There has always been cancer" was the most frequently employed intervention that put a sudden end to most exchanges) or by doubting their very own thoughts and observations (i.e., by saying "I am not sure," "No one knows," etc.). These two accounts taken from my fieldnotes illustrate these exchanges among the women of General Artigas:

I'm with Julia. It's the afternoon; we're sharing mates in her kitchen. It's just her and me. Julia's two daughters are playing in the backyard with some girlfriends, her baby boy is sleeping in his cart. We've been talking for a while, on how well the town—and her family—is doing with the soy boom. With her husband they run a store downtown: "When el campo is doing well, we all do well," she tells me. (...) As time and mates goes by, Julia starts telling a different story. Slowly, her
fears and scares start to come out. She mentions her neighbor, a contractor, who parks his agricultural machinery right across the street. Then, it's the fumigations, far too close from town limits. There it is also the fertilizer plant. She is concerned, but she's never too specific, so I have to prod her, "So what's the problem with all that?" Julia first tells me about her plants in the front porch dying out. Then, it is about the number of people in town suffering with cancer, "young people, of thirty-something, forty..." Later it is about miscarriages and babies born with malformations, one of those, her own niece. ¿Pero será por eso? "Would that be the reason?" Julia raises the question herself, Would it be because of the agrochemicals? She replies right away, seemingly to me, but not really, it seems she's mostly talking to herself: "I don't know. No one knows."

We're having asado, a barbecue, at Martín and Carolina's home. They're a young couple with two small children. There are other guests, some family friends. Martín runs a 1,000 ha farm, most of which is dedicated to agricultural production, mostly soy, and cattle raising in feedlots. The meat we're eating comes from the family feedlot. At the table, everyone extols the quality of the meat, Martín in particular, who leads the conversation on the superior quality of feedlot raised beef. We spend most of our meal talking about my research and thus we talk about el campo and its bounties, about technology, about progress, and politics as well, how the Kirchners' policies hinder progress, etc., a celebratory mood on all the benefits of ag-extensive production. When the meal is over we clear the table for dessert and coffee. "We" meaning "the women," the men stay sitting, as it is usual. It is behind doors, back in the kitchen, where a totally different story emerged. In the kitchen, doing dishes, it's just Carolina and me: we are shoulder to shoulder, she's washing the dishes, I'm with a cloth drying them. Out of the blue (as not a word had come out on the table on these issues) and in a whisper, Carolina tells me about these three women in town who had to interrupt their pregnancies because the fetuses' heads weren't growing. Then, she tells me about the growing number of people with cancer in town. She's worried, I can tell. To dispel her worries she calls often on the public mantra "I know, there has always been cancer." Yet she can't help to add, Todos dicen que no, pero yo creo que sí, que los agroquímicos tienen que ver, "Everyone says they don't, but I think so, that agrochemicals have something to do with this."

These exchanges testify to women's worries and fears, speculations shared in murmurs and whispers, about the potentially hazardous effects of agrochemical use. In General Artigas, none of the men I had spoken to ever raised any of these issues. Why are

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169 Findings described in chapter 4.
170 Microcephaly is a common reason for miscarriages among sprayed people (see chapter 5).
the women the ones who notice the health hazards of agrochemical exposure? Research on environmental justice and environmental health movements highlights the role of women in cases of mobilization around environmental hazards (Bell and Braun 2010; Brown and Ferguson 1995; Krauss 1993). These studies show that women are the ones who take primary responsibility for the health of families, especially children, and that children’s health is a primary motivator for environmental concern and protest. Thus, they are the women who tend to take the lead in raising environmental health issues and forming community-based environmental health social movement organizations (Bell and Braun 2010; Brown and Ferguson 1995; Krauss 1993; Levine 1982; Shriver, Cable, and Kennedy 2008).

The exchanges with the women of General Artigas exemplify as well how self-policing and denial work to contain grievance-framing and suffocate contestation. "Why people do not protest?" I asked every time I could where these murmurs where whispered around. And every time I was met with a face of resignation and a sigh as a reply. Every time, their silence fed the "spiral of denial" (Zerubavel 2006). Of all, Julia's reply stood out as the most symbolic of the "conspiracy of silence" around agrochemical use in GM soy production in the Pampas. Also in resignation, she plain said, silencing me, and her: De eso no se habla, "We don't talk about that." This is a most iconic phrase that to any Argentine instantly recalls of terror and the complicitities of silence around the disappeared during the Dirty War, the latest and crudest of Argentine dictatorships; the hugest elephant in Argentines' collective history.171

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171 That is until very recently, with the Kirchners' efforts to appeal for Memory. On silence, terror, and the legacy of the Dirty War, see Kaiser 2005. The "We don't talk about this" attitude of most Argentine citizens during the dictatorship is well exemplified
In general throughout my fieldwork, men directly involved in soy production did not raise any of these issues, except to minimize them, or otherwise plain disqualifying the people involved in movements or anyone who dares to question glyphosate toxicity, by questioning their level of knowledge, information, or mental sanity. Many times throughout my research I heard soy producers calling anyone concerned about glyphosate's toxicity, "uninformed," and even "paranoid." The Mothers of Barrio Ituizangó Anexo, as I described in chapter 5, had been consistently called crazy and hysterical. This is a most common way for men to dismiss women, calling them emotional and irrational. As the women are the ones whistling the bell on the health hazards of agrochemical spraying and leading the movements against GM soy producers, it makes most sense that men and the institutional power structure will use any means to dismiss their demands (see chapter 5). Feeling powerless, the women will silence themselves; that is, probably only until their own children start dying.

Women are typically not directly involved in soy production so I did not frequent many of them throughout fieldwork (if there were any women around, i.e., a wife, she would leave the room by the time the "official" part of the interview would start). That changed in General Artigas where my main contact and informant, Mari, was a woman and a relative of a family friend. Through her I got, almost automatically, "insider" status among the women (her friends, relatives, neighbors, and friends of friends). Spending time with her gave me the opportunity to "hang out" with these women that were very close to each other (and trusted each other) when I wasn't off in more formal interviews. So I cooked with them, did dishes with them, played with their kids and shared mates in the Oscar's winner movie The Official Story and in María Luisa Bemberg's movie, De eso no se habla.
with them when their husbands were out working or sleeping their siesta. It was then, when I wasn't "working," when it seemed nothing was "happening," that everything was going on. Unfortunately, I have not had the chance to gain this level of confidence with any other group of women in other rural towns I visited. One has to wonder then, How much whispering is happening in other kitchens, in other rural towns in the Pampas? For this dissertation’s sake it is also important to ask, When (and Why) do the women stop whispering and start whistling? When do they become the whistleblowers that break the silence and unveil the elephant? Some thoughts on this in the Conclusions, coming next.
CHAPTER 7. CONCLUSIONS

This dissertation is a case study of agrarian transformation in an agro-export society, Argentina. I have presented the process of adoption of the technological package of genetically modified (GM) soy in the Argentine countryside, its socio-ecological consequences, and Argentines’ responses to it. In particular, this research addresses Argentina’s unique situation of being a developing country that has positively embraced the biotechnology of GM seeds as a key accumulation strategy without the emergence of major contestation against GM soy monocropping. In order to answer the puzzle of quiescence, I looked at how power relations structure access to social and environmental goods and bads as well as how power relates to the causes of consensus and conflict.

7.1 SUMMARY OF MAIN ARGUMENT & FINDINGS

The Social Basis of Technological Innovation

In this dissertation I have looked at how specific social actors and institutions control and define purposes for GM biotechnology in Argentina. Thus I have aimed to explore GM biotechnology not by itself but as an exercise of power.

In Argentina, GM biotechnology, GM soy in particular, has been promoted by a corporate-state alliance as a key accumulation strategy. In the context of the neoliberal restructuring in the 1990s, an agro-export model based on soy exports became the preferred model of development for Argentina. Neoliberalism gave this Non-Traditional Agro-Export (NTAE) model its institutional, legal, and ideological framework. In chapter 3, I have shown how the corporate-state alliance has been able to implement and promote
the GM soy model through material and institutional means. The main goal of
corporations for promoting this model is to increase profits. For the state, the main goal is
to bring about socio-economic wellbeing through economic growth.172 To this goal it is
important to recall the reinstatement of agricultural export taxes, which have been
instrumental for funding the Kirchners' National and Popular model. It is also important
to underscore, as I showed in chapter 2, the existence of a conducive global context for
soy exports, as commodity prices rise fueled by growing demand from China and India.

Therefore, among the powerful there is consensus around the benefits of GM
biotech, and the expansion of GM soy in particular. They have been able to create
consensus among the general population as well. The main framing of GM biotechnology
and soy production, over which there is shared consensus, is in terms of its benefits:
Technological innovation and mechanization increases efficiency of agricultural practices
and thus production and profitability. Technological innovation is framed as the
consequence of an objective and neutral science that will bring Progress and Modernity
by means of economic growth. This 'techno-science' (Giarracca 2007; Lander 2000b;
Santos 2009) framing of GM biotechnology enjoys widespread consensus in Argentina.

Creating Consensus and Quiescence

In this dissertation I rely on Steven Lukes' theoretical framework on power
(Lukes 2005). Lukes' take on power emphasizes what he conceptualizes as the third

172 It is important to note that this not about any specific individuals but about the
institutional framework: how corporations and the state operate. Corporations need profit
to stay in business and deliver returns on investments to shareholders. The State needs
votes and money to pay for infrastructure, public sector service maintenance, and welfare
benefits, among other things, as well as it needs some agreement with the business sector
(or fear a lockout or a coup).
dimension of power: the aspect of power that creates quiescence and consent by making the interests of the powerful everyone's interests. In this dissertation I have shown how in Argentina the corporate-state alliance has been able to secure consent through material, institutional, and discursive means.

The corporate-state power alliance in Argentina controls resources and the cultural apparatus and this is strategic in creating hegemony (Gramsci 1972; Newell 2009a). In chapter 4, I have given special attention to discussing the role of the media in creating quiescence and consent. This is done by reporting on GM biotechnology and soy almost exclusively in terms of the positive/benefits framing; and by not reporting on the negative socio-ecological consequences of GM soy expansion, nor on events of mobilization and contestation against the GM soy-based model. Reporting creates visibility of the issue necessary for grievance-making. This would be particularly important in Argentina, as the majority of population is urban and disconnected from anything rural.

As this dissertation underscores, a key issue for mobilization and quiescence is grievance-making: without grievances there is no contestation, and there cannot be grievances if people do not see anything wrong with the current situation. For collective action to emerge, it is necessary to frame the issue as a grievance, as a problem that requires remediation. Due to biased reporting of positive consequences and underreporting of negative ones, urban dwellers, that is, most of the population, no saben ni se enteran, don't know or have a way to find out about negative consequences or contestation around soy but rather easily buy into the hegemonic discourse of the benefits of the soy model that the media feeds them.
In terms of grievance-making in relation to GM biotechnology, as I show in chapters 2 and 3, Argentina stands out in that rather the opposite happens: the technology is framed almost solely in terms of benefits. There is a shared cultural predisposition to see the countryside and agriculture as a profit-making activity, to see Argentina as a food-producing country ("the Breadbasket of the World"), to see technology as the most efficient way to control nature (and increase production), and to understand scientific and technological innovation as a straight path to modernity and progress. It is in these terms that soy producers claim that agriculture in Argentina is the "best in the world." As shown in chapter 4, this hegemonic discourse takes hold in Argentine national identity, and thus 'cultural preparation' is key to the consensus argument raised in this chapter.

**Social and Ecological Impacts of GM Soy Production**

As shown in chapters 3 and 4, consensus most significantly takes hold in the fact that in the terms considered important/valuable, that is economic growth based on increased production and exports, the model actually works: every year there have been record harvests and record profits: It is the soybean boom. However, this dissertation highlights the fact that the overall impacts of the GM soy model are less positive. As shown in chapters 3 and 4, the GM soy-based agrarian transformation has implied radical changes in socio-ecological dynamics in Argentina: increased inequality due to concentration of landholdings and agribusinesses, rural displacement through a violent politics of dispossession, loss of local control, the loss of food security, and health hazards due to agrochemical exposure add to the disruptions at the ecosystem level,
including deforestation, loss of biodiversity, emergence of glyphosate-resistant superweeds, nutrient depletion, and air, water, and soil pollution.

As shown in chapter 5, some groups of people who experience these costs directly have framed them as grievances. As such, two types of social movements have emerged to contest GM soy in Argentina: One, composed by campesinos and indigenous peoples, who contest GM biotechnology as part of a wider struggle against natural resource extraction and neoliberalism. And the other one, assemblies of fumigated peoples, organizing around concerns for the health effects of agrochemical spraying. While these two movements have different constituencies and goals, there is a common ground in that at the basis it is a matter of protecting lives and livelihoods. As such it fits in the common experience of other environmental justice movements of the Global South (Guha and Martinez-Alíer 1997; Taylor 1995).

**Unequal Distribution of Social and Environmental Goods and Bads**

Another key theme explored in this dissertation is how distance and the unequal distribution of social and environmental goods and bads have consequences on grievance-framing. As shown, the powerful, the ones that reap most of the benefits of the soy model, are also the ones the furthest removed from its social and ecological costs. So it isn't simply that this model is highly profitable, but it matters also that elites are distanced from the consequences of their decisions (Gould, Pellow, and Schnaiberg 2008; Gould 2010; Gould 2006; Mohai, Pellow, and Roberts 2009). Probably things would be much different if the children of agribusinesses' CEOs were the ones being sprayed with agrochemicals. On the opposite side of the power spectrum are the powerless, who, on
site, bear all the costs and reap none of the benefits: campesinos, indigenous peoples, the fumigated people who lose their homes, their territories, their health and their children due to the expansion of the agrarian frontier and the toxic effects of agrochemical spraying.

As shown in chapters 4 and 6, most of the rural populations, in the Pampas in particular, hover somewhere in between these extremes: they reap some benefits, and bear still unclear/undefined costs (due to unawareness, uncertainty, and denial). As Tilly (1991) argues, quiescence can also be explained by/when subjects get something in return for compliance. This is certainly the case at hand here. As described in chapter 4, a key to consensus and quiescence is that GM soy means direct and indirect income flowing into rural towns. In these booming soy towns there is a shared notion of *todos vivimos del campo*, "we all live off the countryside." In the Pampas, this is particularly important in contrast to previous decades of crisis.

In terms of the ecological costs, while in the North the expansion of industrial agriculture and deforestation are issues that concern rural and urban folks alike, in the Pampas these do not seem to be issues that could be framed as grievances: Mechanization of the Pampas is historical and framed as a positive development, as technological innovation is a sign of modernization and progress. Deforestation is a given. The adoption of no-till machinery (*siembra directa*) fulfills a double promise, that of "technological innovation = modernity" as well as it comes to deal with the problem of sustainability of agrarian practices. In terms of pollution, there is a shared perception that this is a problem of large cities, living in the countryside is living in "nature" (outdoors, where there's fresh air, open spaces).
In terms of the social costs, the health hazards of agrochemical use are, –as exemplified by the emergence of *Paren de Fumigar* movements (chapter 5) and the veiled concerns of the women in General Artigas (chapter 6)–, the most salient source of concern (and conflict and potential conflict) for rural inhabitants in relationship to GM soy. Yet, these are not automatically framed as grievances. For rural populations, it is hard to articulate claims: people are unsure and sometimes completely unaware or even ignorant of the real effects of agrochemical exposure; a clear evidence of how successful "bio-hegemony" is (chapter 4, Newell 2009a). Here "science" is particularly at stake: Lay people, excluded from scientific knowledge, research, and development, have a blind belief and trust on the "experts," who sustain glyphosate is of low toxicity. In chapter 5, I discuss how power is behind science by showing how corporations and the state construct and promote this discourse, as well as discourage doubt and dissenters. Thus, showing how the power elite uses science as a means to create confusion, uncertainty, and unawareness (and thus, quiescence) (see Brown 2007).

While compliance-in-exchange-for-something-in-return (i.e., economic benefits) explains lots of the support for GM soy in rural towns, the reason for quiescence – especially in relationship to health hazards of agrochemical exposure–, can be more emotionally complicated than a straightforward preference for profits/material interests. As the stories of the women of General Artigas tell (chapter 6), it is their own husbands and neighbors who are directly involved in soy production. Raising questions on the toxicity of agrochemicals, are, to say the least, very difficult: could it be your own lifetime neighbors killing you and your family? Could it be your source of income, what feeds you and your family? Could it be your own husband, the father of your kids? As
Schurman and Munro (2010) argue, for a grievance to be framed as such, an oppositional consciousness is necessary. In this case, this oppositional consciousness is hard to emerge, as everyone is so deeply involved in the process. As such, the women in General Artigas have found a very efficient way to deal with the problem: plain deny it. This, of course, complicates issues even further: grievances are social problems that require a *shared* framing (a shared interpretation of a grievance). By denying in public and self-policing, the women close the opportunity to come up with a common framing of agrochemical spraying as a grievance.

**Technological Trajectories and the Agent of Change**

As social movement scholars argue, for contestation to emerge, it is required (1) a grievance, an issue framed as a social problem, and (2) opportunities for mobilization, including resources (Klandermans 2001; Schurman and Munro 2010). While some social movement theories downplay the role of grievances in social movement formation, grievances are not ubiquitous. On the contrary, they require active framing (Snow and Benford 1988). Grievances thus are a necessary (yet not sufficient) cause for social movement formation (Mahoney 2003). Moreover, as this dissertation shows, framing an issue as a grievance is a complicated and contested matter, which depends on subjective, cultural, and structural factors, which can then ignite contestation but also promote consensus and quiescence.

This dissertation also shows that, in studies of quiescence, it is important to bring into analysis another necessary (yet of course not sufficient) cause for social movement formation. That is, (3) People, *the actor of social change*. The actual existence of human
beings that make up a movement—just as grievances are—is often considered a trivial, even tautological cause for the study of social movements, and thus usually left out of analysis (Mahoney 2003). In its analysis of quiescence, this dissertation brings this issue to the forefront. The existence of people that organize in collective action is the most basic assumption for the existence of a social movement. People protest and mobilize. As shown in chapters 3 and 4, the adoption of the technological package of GM soy has further increased rural displacement and depopulation, increased land concentration, and the loss of local control. Farming is done by machines, controlled by people who don't have to be there anymore. That is how the treadmill of production replaces people with technology (as chemicals and energy), decreasing employment and increasing ecological disorganization (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994). Who would start a movement if no one is out there, in the countryside, bearing the social and ecological costs of the agrarian transformation? Who would take up these issues as grievances if these aren't directly experienced by anyone? This dissertation highlights how technology is truly an exercise of power, as the technological trajectory has been to depopulate and pacify (Shiva 1991), by getting rid of peasants, the most restive of populations (Moore 1966; Paige 1975; Skocpol 1979; Wolf [1969] 1999).

7.2 SIGNIFICANCE

Argentina has been cited as a recurrent "success story" in studies on agricultural transformations based on GM crop adoption (Chudnovsky 2006; Qaim 2005; Trigo 2011). These studies emphasize the smoothness of the transition and the benefits it has brought, as the adoption of the technological package of GM soy increases both
production and profits. However, set in context, the transition was not so straightforward that the GM soy model can easily be replicated in other countries, nor are its consequences all beneficial.

The particular institutional and ideological framework in a specific domestic and international political economy, that of Argentina in the neoliberal 1990s, became the most conducive context of adoption of the new technological package of GM RR soy. In the first decade of the 21\textsuperscript{st} century, the expansion of the \textit{modelo sojero} occurred despite a change in Argentina's domestic political economy. The rise of a self-proclaimed anti-neoliberal and progressive government, the Kirchners', has in fact not dismantled the mode of production set in place by the previous neoliberal administration. To the contrary, the Kirchners' administrations have created favorable conditions for the expansion of GM soy. Driven by debt, both neoliberal and post-neoliberal governments have relied on state policy to intensify Argentina's comparative advantage.

In terms of economic growth, the results of the \textit{modelo sojero} have been outstanding. Yet the overall impacts of the GM soy model are less positive. The GM soy-based agrarian transformation has implied radical, negative changes in socio-ecological dynamics in Argentina. Economic gains thus create socio-ecological unsustainability, threatening the continuity of the model itself (Gould, Pellow, and Schnaiberg 2008; Schnaiberg 1980; Schnaiberg and Gould 1994).

In the last few years, the Kirchners' National-Popular model has offset the negative social impacts associated with GM soy. Increased social spending and infrastructure investment certainly improve people's wellbeing, in particular that of the poorest. In an interesting twist, the success story of GM soy becomes legitimized under
the Kirchners' model, as the expansion of production and profits now allegedly benefits all instead of being appropriated by an elite now that the government directly intervenes to redistribute soy-derived revenue. However, the potential of the National-Popular model to fully address social problems is questionable. As funding for the National-Popular model relies heavily on soy export taxes, at least as it is currently configured, its continuity requires the continuous expansion of GM soy production, an already unsustainable practice. The constant search for increased revenue ends up undermining the project itself, in a destructive treadmill where the natural resource base is even more rapidly depleted to allegedly increase social wellbeing (Gould et al., 2008, O'Connor, 1998, Schnaiberg, 1980, Schnaiberg and Gould, 1994).

Within this model, commodity exports remain at the core of Argentina's development strategy, repeating Latin America's colonial pattern of dependent development (see Cardoso and Faletto 1979). Dependence on natural resource extraction is hardly a new phenomenon for Argentina, or Latin America. Pressured by external debt, and under the ideals of progress and modernization, governments in the region have promoted technological innovation to increase productivity of the export-commodity sector (whether it is soy, fruits, minerals, or oil). With GM soy Argentina continues to export Nature (Coronil 1997), relying on natural resource extraction for its sustenance. Other progressive governments in the region, such as Bolivia, Brazil, Ecuador, and Venezuela are also repeating this pattern, of funding local socio-economic development through faster and further extraction (see Gudynas 2009). As this dissertation shows, the consequences of this are manifold. It has to be emphasized moreover, that this is a highly unstable model. In the short and medium term, this is a highly unstable model because it
is subject to cycles of boom and bust. GM soy production in Argentina is driven by constantly expanding demand in China and India, which caused international prices to spike and absorbs increasing production at home. As with any cycle of boom and bust, however, the question is not if demand will ever slow down or even end, but rather when it will happen, and how hard it will hit.

In the long run, the quest for growth and profits through constant technological innovation implies faster extraction and, thus, faster degradation of the social and ecological base (Gould et al., 2008, O'Connor, 1998, Schnaiberg, 1980, Schnaiberg and Gould, 1994). There is a tradeoff between immediate rewards and the long-term consequences of a model of development based on natural resource extraction, where the promise of material wealth is prioritized even at the cost of increased environmental degradation (Gould and Lewis 2009; McMichael 2007; Redclift 1992). Transgenic crops have been at the core of Argentina's development model as they are presented with the promise of dynamism, efficiency, and increasing yields and profits; a technology particularly fit and necessary to exploit Argentina's "potential" for feeding the world. At the same time however, the constant expansion of production allowed by the technological package of GM soy, under structural conditions that privilege GM soy over other agricultural possibilities, accelerates socio-ecological degradation. In this way, the GM soy-based agro-export model as currently configured in Argentina is a socially and ecologically unsustainable model of development.

GM crops have been presented to the world as representing the promise of modernization, progress, and development, a "success" narrative that has held up well in Argentina. However, under close scrutiny, this study shows that the potential of
transgenic crops to improve livelihoods in the Global South is less straightforward than GM supporters suggest. It is important therefore to broaden the discussion of the "GM promise" by taking into account who are in control of the technologies and of natural resources, rather than assessing technologies in a vacuum. In other words, GMOs cannot be taken as a promise by themselves. Technologies are tools: tools of power. It matters who controls them. Until feeding the poor and protecting the environment become desired goals by those in power, the promise will remain unfulfilled. These considerations are urgent as transgenic crops are adopted throughout the Global South, as the rapid expansion of Argentina's GM soy model in South America exemplifies.

7.3 FUTURE RESEARCH

There are several lines of research that derive from this dissertation that I would like to explore in the near future. Of utmost personal importance, the most pressing question to me now is how to promote anti-GM contestation in Argentina. Because of their sheer number, urban citizens need to be involved. The question is then how: How to get urban dwellers connected with rural issues? As consumers? Concerns raised by urban movements as consumers of GM foods have not yet spread in Argentina. There are events of agroecology urban farms and farmers' markets in some cities, such as in Rosario, Mar del Plata, and Buenos Aires, but those aren't widely dispersed yet. How to raise awareness among the urban population is thus a main concern. In this line, I would like also to explore and maybe even provide suggestions for alternative modes of agricultural production that, in contrast to large scale industrial agriculture, are just, equitable, and sustainable.
Another line of research that derives from this dissertation is to compare the case of Argentina with the experience of other countries. Thus, future research will encompass cross-national comparative research on GM soy adoption contrasting the case of Argentina with other countries of the Global South, for example, comparing with Brazil or Tanzania.

Third and last, timely and important research is necessary to understand and assess the current state and consequences of the GM soy expansion in South America.
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