

Farming in Fly-Over Country: Fragmented Polarization in Science, Politics, and  
Economics Among Michigan Farmers

By

Ethan Paul Gibbons

Dissertation

Submitted to the Faculty of the  
Graduate School of Vanderbilt University  
in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

In

Sociology

May 13, 2022

Nashville, Tennessee

Approved:

David J. Hess, Ph.D.

Patrick Trent Greiner, Ph.D.

Shaul Kelner, Ph.D.

Shannon Elizabeth Bell, Ph.D.

Dedication:

This project is dedicated to my family. I am the person I am because of the people you are.  
Thank you.

### Acknowledgments:

First and foremost, I am extremely grateful to my advisor, Dr. David Hess for his invaluable advice, continuous support, and endless patience during the completion of this dissertation. His incredible knowledge of his academic field and plentiful experience in the world have encouraged me throughout my experience in academic research and daily life. I would also like to thank Dr. Patrick Greiner for his contribution to the conceptual rigor and sociological impact of this project. Furthermore, I would like to thank Dr. Shaul Kelner for his immense support in the technical aspects of this study and for encouraging me to think beyond the immediate case to the larger implications of this work. I would also like to thank Dr. Shannon Bell, whose work served as an early inspiration for this project and who served as an incredible mentor through the entire process. I would like to thank my fellow students in the Sociology Department at Vanderbilt. It is their kind help and support that have made my study and life in graduate school so wonderful. Finally, I would like to express my gratitude to my family. Without my parents and my brothers, I would never have had the drive to explore interesting ideas nor the platform to reach for my dreams. Without the unending support and encouragement of my wife, Kelly, none of this could possibly have happened.

# TABLE OF CONTENTS

|  | Page |
|--|------|
| DEDICATION.....  | i    |
| ACKNOWLEDGMENTS .....  | ii   |
| LIST OF TABLES .....   | v    |
| LIST OF FIGURES .....  | vi   |
| Chapter  |      |
| I. Introduction .....  | 1    |
| 1.1 Problem/Puzzle.....  | 1    |
| 1.2 Importance .....   | 3    |
| 1.3 Research Goals & Questions .....   | 6    |
| 1.4 Literature Review.....   | 7    |
| 1.4.1 American Polarization.....   | 9    |
| 1.4.2 Institutional Logics .....   | 13   |
| 1.4.3 Polarized Social Science Literature.....                                 | 15   |
| 1.4.4 Fuzzy Polarization: Overlaps & Fragmentation .....                       | 26   |
| 1.4.5 Summing Up: Fuzzy, Reinforcing, & Polarized Logics .....                 | 36   |
| 1.5 Method .....   | 39   |
| 1.6 Chapter Outline .....  | 48   |
| II. Knowledge.....   | 48   |
| 2.1 Knowledge within the Logic of Industrial Agricultural.....                 | 48   |
| 2.1.1 Production Science in the Discourse of Industrial Farmers.....           | 51   |
| 2.1.2 Production Science in the Practices of Industrial Farmers .....          | 59   |
| 2.1.3 Production Science View of Ecological Agriculture.....                   | 70   |
| 2.1.4 Summary of the Knowledge of Industrial Farmers.....                      | 91   |
| 2.2 Knowledge within Ecological Agricultural Logics.....                       | 93   |
| 2.2.1 Impact Science in the Discourse of Ecological Farmers.....               | 94   |
| 2.2.2 Impact Science in the Practices of Ecological Farmers .....              | 111  |
| 2.2.3 Impact Science View of Industrial Agriculture .....                      | 124  |
| 2.2.4 Summary of the Knowledge of Ecological Farmers .....                     | 147  |
| 2.3 Conclusion: Polarization or Fragmentation in Agricultural Knowledge? ..... | 150  |
| 2.3.1 Overlaps in the Knowledge of Ecological and Industrial Farmers.....      | 151  |
| 2.3.2 Fragmentation in the Knowledge of Ecological and Industrial Farmers..... | 158  |
| 2.3.3 Conclusion .....   | 163  |
| III. Politics.....   | 167  |

|  |         |
|--|---------|
| 3.1 Politics within the Logic of Industrial Agricultural.....                  | 169     |
| 3.1.1 Conservative Political Discourse Among Industrial Farmers .....          | 170     |
| 3.1.2 Industrial Farmers' Views of Progressive Politics .....                  | 188     |
| 3.2 Politics within Ecological Agricultural Logics.....                        | 201     |
| 3.2.1 Political Discourse Among Ecological Farmers .....                       | 202     |
| 3.2.2 Ecological Farmers' Views of Conservative Politics .....                 | 215     |
| 3.3 Conclusion: Polarization or Fragmentation in Agricultural Politics? .....  | 232     |
| 3.3.1 Fragmentation in the Politics of Ecological and Industrial Farmers.....  | 234     |
| 3.3.2 Overlaps in the Politics of Ecological and Industrial Farmers .....      | 241     |
| 3.3.3 Conclusion .....   | 245     |
| <br>IV. Economics .....  | <br>249 |
| 4.1 Economics within the Logic of Industrial Agricultural .....                | 251     |
| 4.1.1 Economic Practices of Industrial Farmers.....                            | 252     |
| 4.1.2 Economic Discourse Among Industrial Farmers .....                        | 275     |
| 4.2 Economics within Ecological Agricultural Logics.....                       | 297     |
| 4.2.1 Economic Practices of Ecological Farmers .....                           | 299     |
| 4.2.2 Economic Discourse Among Ecological Farmers.....                         | 317     |
| 4.3 Conclusion: Polarization or Fragmentation in Agricultural Economics? ..... | 327     |
| 4.3.1 Fragmentation in the Economics of Ecological and Industrial Farmers..... | 329     |
| 4.3.2 Overlaps in the Politics of Ecological and Industrial Farmers .....      | 333     |
| 4.3.3 Conclusion .....   | 336     |
| <br>V. Conclusion.....   | <br>338 |
| 5.1 Farming in Flyover Country.....  | 338     |
| 5.2 Contributions to the Literature & Future Research .....                    | 350     |
| 5.3 Policy Recommendations.....  | 356     |
| <br>VI. Works Cited .....  | <br>361 |

## LIST OF TABLES

| Table  | Page |
|--|------|
| 1. Stratification of Research Participants ..... | 46   |
| 2. Typology of Knowledge Among Farmers.....      | 157  |
| 3. Typology of Politics Among Farmers .....      | 240  |
| 4. Typology of Economics Among Farmers .....     | 334  |
| 5. Farm Size and Products .....                  | 367  |

## List of Figures

| Figure                     | Page |
|----------------------------|------|
| 1. Recruitment Map .....   | 44   |
| 2. My Governor Sign .....  | 191  |
| 3. Grain Storage Bins..... | 253  |

# Chapter 1: Introduction

---

As I ride in the “buddy seat” of a gigantic green combine through a corn field on a cold October afternoon, I marvel aloud to its operator, Gary, about the sheer quantity of corn the machine can process, the technological sophistication required for the machine to detect minute changes in the quality of the grain, and the logistical coordination necessary for Gary’s family and employees to harvest the grain, dry it to the correct specifications, and sell it to a buyer.

Gary looks at me with a wry grin and says, “Yeah, man. It’s pretty wild. It’s pretty different from when my grandpa was out here. I can’t wait to see what it’s like when [my kids are] doing it... Somebody’s got to keep feeding the world.”

---

In a disused urban lot in central Michigan, James is growing fruits and vegetables for sale at several local farmer’s markets and to patrons of his community-supported agriculture (CSA) program. The property has sat vacant for the several decades since the previous owners left the city. After knocking the dilapidated houses down, the city now leases the property to James and his wife to operate their small urban farm. James and his wife started farming after a health scare led them to carefully select where their food comes from. According to James, “People are going to start realizing how bad their food is for them, for their kids, and for our planet. We need more people out here doing stuff like this.”



## 1.1 Problem/Puzzle

The two vignettes above demonstrate a sharp divide in the United States. On the one hand, the nature of industrial farming is all about rapid innovation in agricultural technologies and science, leading to huge increases in the size and capacity of farm equipment as well as in the volume of agricultural production. Despite significant concentration within the industry, many industrial farms remain family operations. Industrial farmers see themselves as inheritors of a responsibility to feed the world that they also plan to pass on to the next generation. On the other hand, a group of farmers have dedicated themselves to creating an alternative agricultural system due to the environmental and health damage wrought by the industrial farming system. By finding creative access to land and customers, this group of ecologically-minded farmers have built a significant groundswell of support among a public interested in living in a more harmonious relationship with nature. Both groups of farmers rely upon for the natural environment for their material subsistence but have starkly different understandings of how to best navigate their interaction with it. What has resulted is stark polarization in the field of agriculture in terms of the legitimacy of different types of knowledge, the appropriate political intervention in agriculture, and the right economic practices for farmers.

Sociologists and other social scientists as well as a host of political pundits, cable news talking heads, and recently-minted dinner table experts have commented on the political polarization in the United States. It seems that the political ideology one holds can alter perspectives on issues as seemingly obvious as the legitimacy of scientific knowledge and expert perspectives. However, recent literature has also indicated that perhaps an understanding of American society as entirely polarized misses some details within this

polarization. For example, some research has shown that although conservatives tend to be accused of climate change denialism, they are not monolithic in their resistance to environmental science. For example, although farmers tend to be conservative and have been accused of causing a variety of environmental damage, many have been shown to consider themselves stewards of the land, using the newest technology and science to minimize their impact while maintaining profitability in an increasingly competitive industry, all while “feeding the world.” In addition, although proponents of alternative and ecological forms of agriculture claim scientific legitimacy with respect to the environmental impacts of industrial farming, research on the detrimental environmental effects of organic agriculture and the potential benefits of genetically modified organisms (GMOs) are examples of science that is often rejected by this group. This study argues that industrial and ecological agriculture represent competing agricultural logics that variously use and reject various scientific perspectives in a polarized conflict that mirrors broader American culture. However, despite the dominance of polarization in this field, important areas of fragmentation and overlaps remain.

As such, this project seeks to address the following research problem: Although American society has become more politically polarized on a variety of issues, there is also evidence for complexities within each pole on issues including the environment and climate change, the safety of various food-production processes, and the validity of scientific knowledge. Because conventional farmers often self-identify with conservative politics (which has historically been associated with resistance to environmental regulation) but are also exposed to weather instability resulting from climate change and must make decisions regarding chemical inputs and other agricultural practices, they are a good group to explore the

“conservative” side of the complex political polarization of these issues in the U.S. Conversely, although alternative farmers often fall on the left of the political spectrum and build their practice from a progressive critique of conventional agriculture, they also challenge conclusions about the safety of food-production processes reached by mainstream scientific institutions and occasionally fail to achieve the environmental and social justice goals of the movement itself, making them a valuable population for examining the complexities of these issues within the “liberal” end of the American political spectrum. This study will examine how farmers of all stripes perceive the modern world epistemologically, politically, and economically as well as how farming shapes their positions on specific scientific, political, and economic issues (e.g., attitudes toward climate science, climate policy, renewable energy, sustainable agriculture, and genetically-modified food). In addition, this study will examine how these perceptions shape the way that farmers practice agriculture and how their agricultural practices shape their perception of these issues. In doing so, the study will contribute to the broader problem of the relationship between political polarization, scientific knowledge, and environmental values in the U.S.

## 1.2 Importance

According to leading environmental scientists, our planet is fast approaching an apocalyptic environmental scenario as the result of the environmental impacts of industrialization (IPCC 2014). The industrialization of agriculture has been central to the development of the modern world, allowing fewer people to produce food and fiber for the rest of the population (freeing them up for non-agricultural labor), while also contributing significantly to environmental destruction. Estimates of the contribution of the agricultural industry to global greenhouse-gas

emissions range from 9% (US EPA 2019) to between 14 and 18% (Conforti 2011). In addition, agriculture also affects ecosystems through land-use changes and the release of chemicals including pesticides, nitrogen and phosphorous fertilizers, and others (Tilman et al. 2001). Although many have argued for ways in which changes in agriculture can both mitigate the extent of climate change as well as contribute to adaptation to a dramatically altered physical environment, many of the changes would entail drastic realignments of the agricultural industry and have not been implemented widely. Despite the proliferation of highly scientific farming techniques, conventional agriculture continues to both implicitly and explicitly challenge scientific findings related to climate change, energy, and food by using carbon- and chemical-intensive farming techniques including monocropping, heavy applications of pesticide and fertilizers, and the use of gigantic farm implements. Although these criticisms of the conventional farming system provide the basis for calls to shift to alternative forms of agriculture, many proponents of alternative forms of agriculture rely on claims about the health effects of genetic modification and the benefits of alternative agriculture which are controversial within the mainstream scientific literature. Although both alternative and conventional farmers use science to claim the legitimacy of their respective positions, they also both contest what some have referred to as “scientific consensus.” This study will contribute to an understanding of how beliefs related to scientific knowledge are shaped in the context of both direct experience with the material environment and the experience of a fragmented and politically polarized landscape of knowledge claims.

The contemporary political climate is one in which many foundational modern institutions, including science, are being challenged (McCright & Dunlap 2010; Norgaard 2011).

Many challenges to the claims of mainstream science have been made with an eye to populist political movements that are distrustful of expertise of any variety. These types of movements have been remarkably successful in the US (Donald Trump), the UK (Brexit), Brazil (Bolsnaro), as well as a variety of other countries around the world. Although these examples are all right-leaning instances of populism, the popularity of American politicians including Bernie Sanders, Alexandria Ocasio-Cortez, and others indicates that the political right does not have a monopoly on the rejection of technocratic “elitism” that is partially inflected by a growing frustration with neoliberal globalization. In fact, in the context of agriculture, opposition to genetically modified organisms can be seen as a progressive-leaning mirror to climate change denialism, with several prominent scientific research bodies pointing to a conclusion with which activists do not agree (American Medical Association 2012; National Academy of Sciences 2016).<sup>1</sup>

In the United States, farming is a highly politicized issue. Billions of dollars of federal subsidies go to the industry in order to maintain domestic food security and geopolitical power. In addition, farmers are a valuable group for politicians of all stripes as they seek to cater to rural voters and nostalgic agrarian images of American society. Farmers are also particularly vulnerable to the environmental impacts of modern society. While climate scientists and other academics have discussions regarding the nature of climate change and how to go about fixing it, changes in the weather ultimately impact farmers directly. While airborne and food-borne

---

<sup>1</sup> I do not claim here that resistance to GMOs and climate change denialism have equivalent bases in “Truth” or “scientific fact,” but that proponents of each position are challenging mainstream scientific institutions and that each have their own rhetoric for claiming the illegitimacy of those institutions in their respective cases. This position is inspired by the science and technology studies concept of “symmetry” (Bloor 1976), although this project will not explicitly invoke the concept. As Lynch (2020) has recently argued, this position is not anti-science, but rather allows the social scientist to analyze debates around scientific issues while provisionally withholding judgement about the “truth” of the claims under examination.

pesticides affect all who breathe contaminated air or consume contaminated food, no one doubts that the most heavily impacted individuals are the farmers themselves. While debates rage over the “reality” of climate change<sup>2</sup> (as well as host of other scientific issues from vaccines to pesticides), we continue to depend upon the natural world for our subsistence. Whether operating under the paradigm of conventional industrialized agriculture or under some form of alternative framework, farmers around the world must develop an understanding of the ways in which they can interact with the environment in order to produce the goods they wish to either consume or sell. The understandings that they come to influence the rest of humanity’s ability to feed and clothe itself and also has the potential to threaten the continued existence of life on Earth.

### 1.3 Research Goals

This project involves an interview-based study of 51 farmers in the state of Michigan on the topic of the practice of agriculture in relation to environmental impact, various forms of agricultural practice, and scientific knowledge. I argue that although a common theme in both the sociological literature and popular media has been the increasing political polarization of American society with respect to these issues, there is considerable fragmentation within groups. Although there has been significant polarization in the political realm, farmers of all varieties depend fundamentally upon the natural environment and scientific research while simultaneously failing to act sustainably and contesting mainstream scientific knowledge. Going

---

<sup>2</sup> Although I will discuss intricacies of the debates about climate change in more detail later, it is important to note that climate change skepticism can be broken down into “trend skepticism” (denying there is any global warming), attribution skepticism (who argue for natural, rather than human causes of climate change), and impact skepticism (who think that climate change is harmless, or maybe beneficial), all of which are active in the agricultural context. For more, see Rahmstorf (2003).

beyond a polarized model to explore the implications and contours of fragmentation and overlap between farmers across the agricultural spectrum, this project seeks to understand how farmers participate in and defy the polarization of American culture in their use and development of knowledge, their political perspectives and discourse, as well as their economic practices and strategies.

#### 1.4 Literature Review

The two broad areas of literature this study will contribute to are interdisciplinary work on polarization and institutional logics. In order to first understand the general context, I will pull from research in a variety of fields to lay out various dimensions of geographic, cultural, and political polarization in the United States. Within this literature, there is a long history of academic researchers seeking to understand why rural and conservative constituents vote in ways that the researchers argue are “against their interests.” I argue that there remains significant work to be done in order to fully understand the complex dynamics at play.

In order to conceptualize the dynamics of polarization within the field of agriculture, I use the institutional logics perspective. Used by researchers in a wide range of disciplines (including sociology, policy, and management), this perspective provides a useful guide to the ways in which countervailing systems of material practices and beliefs can interact with each other over time. In the present context, we can understand the dominant logic of industrial agriculture logic to be currently at odds with the challenging logic of ecological agriculture. Although much of the literature on competing institutional logics aligns with a polarized

perspective on institutional dynamics, some literature points to the possibility for countervailing institutional logics to coexist.

Literature from environmental sociology, the sociology of agriculture and food (SAF), and science and technology studies (STS) provides us with additional perspectives on the issues at the heart of this project. In part 1.4.2, I discuss the literature within these fields that contributes to a polarized understanding of environmental politics, agriculture, and science. Research in environmental sociology provides a detailed understanding of the way in which factors such as the media, ideology, and geography have influenced climate change denialism in the United States. Furthermore, research in SAF argues that the history of American agriculture is one that increasingly favors the dominance of large, industrial farms at the expense of sustainable family farms. A host of research also suggests countermeasures that can be taken in order to create a more sustainable, “alternative” agricultural system. Finally, research in STS provides insight into the way that science and technology have contributed to the industrialization in general and particularly within the field of agriculture.

I do not argue that this study seeks to demonstrate the faults of this literature. Rather, this study, like a good improvisational partner, seeks to say, “Yes, and...” That is, I seek to ask how we might zoom out from this polarization view to observe the complications within this story and think about ways that these dynamics might move forward. With that in mind, section 1.4.4 lays out the overlaps and fragmentation within the existing polarization. Research on variations and changed minds among political conservatives demonstrates important nuance within the political right on environmental issues. Furthermore, research that expands our understanding of anti-reflexivity demonstrates that conservatives do not have a monopoly



on climate change denialism. Criticisms of the organic agriculture movement point directly to the ways in which progressive projects for sustainable agriculture can become counterproductive and unreflexive. Using the concept of symmetry from the STS literature allows for the recognition of the importance of social dynamics in the diffusion of scientific knowledge without denying the validity of such knowledge or making claims of “anti-science” toward any group. This section concludes with by drawing the various literatures together in order to pose four research questions before proceeding to describe the empirical portion of this project.

#### 1.4.1 American Polarization

Political polarization has come to be understood as the norm in the United States. This feels particularly true since the presidential campaign and election of Donald Trump, but the history of polarization in the United States is much longer. A detailed history of contemporary American polarization would likely extend to at least the Civil War. Here, I merely seek to outline the general shape of American polarization as it affects the competition between industrial and ecological agriculture. Whereas a host of high-profile scholars including Arlie Hochschild, Jonathan Metzler, and Robert Wuthnow have studied the phenomenon of polarization among rural conservatives, equivalent studies of polarization on the political left have not received the same attention. Furthermore, studies that have examined polarization across the political spectrum have suggested a more complex model of the phenomenon than might be expected. Additional research suggests that an understanding of the broad application and function of populist rhetoric can deepen our perspective on the current political moment.

Much of the high-profile research on polarization centers on studies of rural

conservatives conducted by academic researchers. These scholars argue that neoliberal policies including environmental deregulation, tax cuts, and global trade agreements have hurt blue collar workers in rural areas both financially and in terms of physical health. From this perspective, it is then paradoxical that these voters would be perhaps the strongest voting base for the Republican Party – the party that has historically pushed these policies most aggressively.<sup>3</sup> That is, the research in this area often begins with the question of why rural constituents vote, “against their own interests.”

A major theme within this literature is that conservative politicians use cultural issues and identity politics within these communities to garner support, then use their political power to pass neoliberal policies. For example, abortion and gay marriage have been leveraged by conservative politicians to rally a passionate voting base (Frank 2004). Importantly, recent research has indicated that many rural residents oppose so-called cultural issues such as abortion and gay rights mainly to demonstrate their religious affiliation and membership within a community, rather than out of strong conviction regarding the specific morality of these issues (Wuthnow 2019). Likewise, the assertion of identity has been pointed to as a major issue in the resistance to the Affordable Care Act (ACA). Supported by many rural residents who, while quite sick and unable to afford healthcare, felt that the ACA benefitted “Mexicans and welfare queens,” many states rejected the expansion of Medicaid associated with the ACA.

---

<sup>3</sup> The shift by the Trump administration away from free trade agreements and global interventionism is part of a larger trend from both parties toward a focus on domestic affairs. Environmental deregulation and tax cuts remain a central plank in the Republican platform.

According to scholar Jonathan Metz (2018), such positions are part of a DuBoisian “wage of whiteness,” actively fostered by the campaign against the ACA by the Republican Party.

These dynamics become particularly salient in the context of environmental harms that come from the expansion of industrial activities. Despite a myriad of documented environmental health calamities, conservative politicians and voters<sup>4</sup> continue to support the expansion of polluting industries within their communities. Partly building on the environmental justice concept of “environmental blackmail” (Bullard 1991), scholars have demonstrated that petrochemical corporations convince small towns to offer tax incentives and to decrease environmental regulations in exchange for jobs in the community (Hochschild 2018). Often, these jobs are either temporary or end up going to wealthy and highly-educated individuals who commute from outside of the community. Despite devastating environmental and health consequences as a result of these industrial activities, members of these communities often are simultaneously proud of hosting thriving businesses and disdainful of the “overreach” of governmental environmental regulation (Hochschild 2018, 78).

The sense of overreach from the government is an important aspect of this literature. Research suggests that rural communities tend to perceive the government in Washington to be broken both in that it is too distant (both culturally and geographically) and that it is overly intrusive in the lives of “normal folks.” Residents of rural towns often feel that the moral communities in which they live are being dismantled in favor of politicians who tell them “who

---

<sup>4</sup> To be clear, this remains the case for working class conservatives. More affluent conservative communities often practice NIMBYism (“Not In My BackYard”) in order to prevent the expansion of polluting industry in their communities.

to feel sorry for.” The frustration of rural Americans around the perceived moral and cultural decline of the nation’s urban political centers is then mobilized around particular political issues such as abortion, immigration, and gun control (Wuthnow 2019).

Research in this area has indicated that businesses also utilize these issues of identity in order to instantiate their own interests directly. For example, coal companies have consistently manipulated the identities of Appalachian communities to connect the success of the community with the success of the mining company in order to counter efforts from the community to limit ecologically- and socially-destructive practices (Bell & York 2010). Furthermore, by shifting away from emphasizing rugged, individualist farmers dominating nature through manual labor toward a model of the “businessman farmer” (emphasis on the *man* in businessman) who works in collaboration with qualified experts (employed by seed or farm implement corporations), these companies seek to entrench farmers’ dependence on agribusiness products (Bell et al. 2015).

From the perspective of these studies, if we were to understand this issue in exclusively economic terms, we would understand this behavior to be irrational. Voting for politicians who cut taxes for the wealthy and limit access to healthcare actively hurts working class folks across the race and geographic spectrum. However, when understood more broadly, the behavior has a certain logic. These studies argue that by positioning themselves as defenders of sacred values including the sanctity of life and marriage, Republican politicians make the support of their constituents a moral imperative. Likewise, this group understands the rejection of the ACA as preventing the exploitation of social safety net systems by cynical and undeserving “others,” who are of course, also racialized. That is, for a certain proportion of rural, white, conservative

voters, rejection of Medicare expansion or support for tax cuts for the wealthy is about the protection of good and similar others (in other words “us”) from exploitation and harm from evil and different others (“them”).

In her study of rural conservatives, Hochschild said that she felt the need to climb a large “empathy wall” in order to understand a group that could not be more different than the progressive Berkeley milieu that she normally inhabits. To raise the stakes even higher, the conflict feels existential to all involved, as the issues include the reality of climate change, the legitimacy of election results, and of the future of this nation and the world.

If Hochschild climbed an empathy wall in order to escape from her Berkeley milieu and understand those on the other side of it, it does not appear that anyone has yet sought to scale that wall in the opposite direction. Rather than seeking to detail polarization on the political left, a body of literature has instead developed around the broad phenomenon of polarization across the political spectrum. This more general body of research has been somewhat paradoxical. Despite mainstream discourse frequently warning of a deepening partisan divide, public attitudes on many issues have not become increasingly polarized (Hill & Tausanovitch 2015). On issues including abortion, climate change, and foreign policy, public opinion has actually remained relatively consistent over time (Baldassari and Gelman 2008). Explanations for this ostensible paradox include selective media attention (Baldassari & Berarman 2007), increasing polarization of political elites that has yet to expand to the general public (Hetherington 2001), and social and geographic sorting leading to a feeling of political homogeneity in social networks (Cowan & Baldassari 2018; Abrams & Fiorina 2012).

In addition, recent research has found that although public opinion has not become more extreme, there has been a consolidation of belief networks (Boutyline & Vaisey 2017). That is, whereas previous research has conceptualized (and failed to document) polarization as an increasingly strong bifurcation of political opinions, what has occurred instead is a broad consolidation of political opinions into encompassing clusters that organize around packages of beliefs (DellaPosta 2020). The subsequent polarization results from the decrease in cross-cutting beliefs, where individuals hold opinions shared across the political spectrum. In what DellaPosta calls the “oil spill” model of political opinion, polarization is imagined as two competing pools of identity, which gradually expand to encompass, “more and more previously ‘apolitical’ attitudes, opinions, and preferences,” (DellaPosta 2020: 508).

Despite the decrease in cross-cutting opinions, one aspect of the current political moment has been applied across the political spectrum. Because the ire held by partisans from both the left and the right is often pointed at economic, political, and media elites, it has frequently been labeled “populist,” a term with a long and complex history in American and international politics. Although some scholars reject the term populism because it tends toward vagueness and can be used as a means to denounce political opponents (Panizza 2005; Moffit & Tomez 2014), others argue that it remains an important phenomenon to understand. For instance, whereas critics argue that the application of the term populist to political campaigns as different as Donald Trump’s and Bernie Sanders’ demonstrates the term’s overly general nature, others contend that the use of populist ideas and rhetoric by a broad range of political actors marks the phenomenon’s unique ability to cross political lines (Brubaker 2017).

In the United States, the term populist harkens to the Populist Party of the late 19<sup>th</sup> century. A champion of small farmers in the Midwest, the Populist Party rallied against the “money power” located in banks and corporations by seeking to nationalize railroads, break up trusts, and strengthen labor unions (Kazin 2016). Despite the early left-leaning sentiments of populism, the term came into vogue in the 1950s as it was applied by scholars including Richard Hofstadter and Daniel Bell to Senator Joseph McCarthy’s efforts to rid the country of communism (Mudde & Kaltwasser 2017). Today, scholars focus on the discourse of populism and how it manifests in different contexts. In general, populists claim to represent the general will of the people against the treachery of the corrupt elite (Mudde & Kaltwasser 2017; Brubaker 2017). These rhetorical strategies can easily be combined with either an anti-government, conservative message or an anti-corporate, progressive one. The most relevant cases for the present study are, on the one hand, the 2016 and 2020 Trump presidential campaigns, and on the other hand, the equivalent presidential campaigns of Bernie Sanders, both of which were highly critical of the political establishment and mainstream media, while arguing that they represented the “real people.”

The sense of political polarization in the United States is frequently discussed and worried about. Although much research has demonstrated the contours of polarization on the political right, studies on the broader polarization have demonstrated the complexity of the phenomenon. Rather than the public feeling increasingly strong about already-held beliefs, polarization in the United States has manifested as two increasingly broad and cohesive sets of beliefs, with a decreasing number of cross-cutting opinions. This form of polarization has been

seized upon by political agents from both ends of the spectrum, who use well-established populist rhetoric to further consolidate a political base around a similar logic.

#### 1.4.2 Institutional Logics

The polarization in the United States can be conceptualized the competition between institutional logics. Although the literature on institutional logics has largely been used within business management research, it is useful here in understanding how competing visions of reality can compete and coexist within a given industry – in this case, agriculture.

The concept of institutional logic was originally introduced as a method for describing the contradictions among the dominant institutions in Western society (Alford & Friedland 1991). From this perspective, capitalism, state bureaucracy, and political democracy are three contending institutional logics that shape the beliefs and practices of individuals in Western societies. Within each institution, the relevant logic creates a system of material practices and symbolic systems by which individuals and organizations reproduce their material lives and render their experiences meaningful. In addition to the market, state, and political system, the family and religion are also considered fundamental institutions with central logics that constrain the means and ends of individuals (Thorton & Ocasio 2008).

Within institutions, various logics compete with one another to become the dominant logic in the field. More accurately, individuals within institutions use various strategies to impose their preferred logic to the level of dominance. Typically, an institution comes to be defined by a single dominant logic, which can subsequently be displaced through a variety of mechanisms including exogenous shocks, entrepreneurial innovations, and cultural mimesis.



For example, from the late 1970s through the early 2000s, the institution of U.S. academic science underwent a radical change in its logic from emphasizing “basic science” and fundamental research to a more market-based logic that focused on creating patentable technology within the university system. This occurred through a decrease in federal funding for basic research (exogenous shocks), the entrepreneurship of faculty in biosciences and engineering (entrepreneurial innovation) and the proliferation of such activities as universities fought to keep pace with peer institutions (mimesis) (Berman 2015).

It is not always the case that competing institutional logics must clash with one another until one is victorious. Indeed, it is often the case that a given institution operates for an extended period of time with competing logics coexisting. For example, when the Canadian government attempted to reorganize the healthcare system to be more efficient in the 1990s, physicians were able to mobilize their power and resist the changes. As such, the healthcare system operated with two coexisting logics for multiple decades until the physicians acquiesced to the changes under an “uneasy truce” (Reay & Hinings 2005). The coexistence of these competing logics was facilitated by mutual respect and collaboration between physicians and those managing the government-imposed change. Given the powerful positions held by physicians, the government was not able to unilaterally impose their preferred logic and instead had to allow for the presence of competing logics (Reay & Hinings 2009). In the present project, we can conceptualize the competing agricultural logics as the industrial logic and the ecological<sup>5</sup> logic. Whereas the former seeks to fit an agricultural system to match and supply

---

<sup>5</sup> As we will see, many have referred to the logic of ecological agriculture under the banner of “alternative” agriculture. Since any challenger to the dominant institutional logic could be described as “alternative,” I prefer the term ecological. The two logics will be described in greater detail in the following section.

the industrial-capitalist model that dominates the global economy, the latter seeks to emphasize the relationship between humans and the natural environment as manifested in the agricultural system. The details of each logic will be laid out in the following section and explored in detail throughout the project.

#### 1.4.3 Polarized Social Science Literature

The previous sections laid out the academic literature about the conservative side of political polarization in this United States. The literature in those sections is part of a larger genre of social science literature that understands American society as polarized. In the following section, I will continue to lay out the social science literature that starts from the perspective of polarization. The literature in environmental sociology emphasizes the importance of climate change denialism as a counterforce to those who seek to build a more sustainable future. Likewise, the literature in the sociology of agriculture and food (SAF) discusses the damages wrought through the history of industrial agriculture and documents attempts to create a sustainable alternative. Finally, the STS literature criticizes the dominance of centralized, industrial science and seeks to offer an alternative, democratically organized system of knowledge production.

#### *Environmental Sociology*

Much of the literature in environmental sociology that addresses the issue of climate change denialism builds from the debate between ecological modernization and treadmill of production theorists. Whereas proponents of ecological modernization argue that modern institutions including science and industry can be reflexively turned in on themselves in order to

adopt sustainable practices (e.g., Mol & Spaargaren 2000; Scheinberg 2003; Beck 2003), treadmill of production theorists argue that modern industrial capitalism is incompatible with environmental sustainability (e.g., Schnaiberg 1980; Foster 1999; York & Rosa 2003). Recent scholars have pointed to climate change denialism as a powerful force undermining the potential for “reflexive modernization” to occur (McCright & Dunlap 2010).

The anti-reflexivity embodied in climate change denialism is exemplified in what some scholars call the Climate Change Countermovement (CCCM) (McCright & Dunlap 2010; Antonio & Brulle 2011). The CCCM falls within the larger political debate between the two major policy regimes in American politics: market liberalism and social liberalism. Whereas market liberalism favors unfettered capitalism, strong property rights, and a minimal social safety net, social liberalism champions modest state interventions such as the provision of welfare and general wealth redistribution. Although market liberalism is well-represented within both political parties in the United States, it is associated most often by the Republican Party, whereas social liberalism is associated with the Democratic Party (Antonio & Brulle 2011).

Because of the preference for unfettered capitalism within market liberalism, the conservative movement in the United States has mobilized multiple methods for minimizing environmental regulations, which they argue hinders companies’ ability to compete. For example, after President Reagan appointed leaders of the Sagebrush Rebellion to lead the Department of the Interior and the EPA (James Watt and Ann Gorsuch, respectively), the appointment of anti-regulation activists to the heads of environmental regulatory agencies has become a common tactic of Republican administrations (Antonio & Brulle 2011). In addition, conservative think tanks such as the Heritage Foundation, the Cato Institute, and the American

Enterprise Institute tanks have focused on producing counter-frames to the environmental movement and climate scientists in order to influence public opinion (Brulle 2014) as well as to “saturate the intellectual environment” of favorably-minded politicians, such that certain arguments and frames will come to mind more quickly than others when it comes time to make a decision on climate change policy (Brulle 2018).

Although the institutionalization of climate-change denialism and anti-environmentalism within the Republican Party is important for considering the extent of anti-reflexivity as well as the lack of effective climate policy in the United States, the relationship of particular policy orientations among party leaders to the beliefs and attitudes of the American public remains bidirectional. That is, although it is certainly the case that political elites influence the attitudes and beliefs of the general public, there is also an assumption that broad public perception of environmental risks is key to developing the political will to implement meaningful governance as well as private action on climate change. As such, a host of research has specifically addressed public opinion on climate change.

In surveys of the American public, the most consistent finding with respect to attitudes and beliefs about climate change is that respondents who consider themselves liberals or Democrats are more likely to believe that climate change is happening and that it is caused by human action than those who consider themselves conservatives or Republicans (Hamilton 2011). In addition, a variety of variables other than political ideology have been shown to be related to beliefs and opinions about climate change, including education, gender, and region. Although many in the ecological modernization camp point to positive relationships between education and belief in climate change as evidence that modern institutions lead to increased

reflexivity, others have found a more complicated relationship. For Democrats, increased education is associated with increased belief and concern about climate change. However, for Republicans, the relationship either does not exist or is actually negative, meaning that increased education decreases belief and concern about climate change (Hamilton & Keim 2009; Hamilton 2011; McCright & Dunlap 2011a).

This effect has been shown to interact with gender as well. McCright (2010) showed that women express slightly greater concern about climate change than men do. Paradoxically, while also having been shown to possess greater scientific knowledge than men on average, women are less confident in their knowledge. Furthermore, conservative white males were the most likely to endorse climate-change denialist views, particularly those who reported understanding global warming very well (McCright & Dunlap 2011b). The authors suggest that this may be connected to the identity-protective cognition thesis and political psychology scholarship documenting the tendency for political conservatives to have system-justifying tendencies (Jost et al. 2008). That is, drawing on Kahan et al.'s (2007) work on identity-protective cognition, which argues that people seek to deflect threats to identities they hold, white men dismiss risks associated with climate change because it is the result of system with which they identify and from which they benefit.

Research has also shown that the media plays an essential role in attitudes and beliefs about climate change. In terms of how the media cover climate change, a central finding has been that journalistic norms of dramatization, novelty, and balance have created a situation in which the public is presented with a view of climate science that is at odds with the view of the majority of climate scientists (Boykoff & Boykoff 2007). This is particularly the case in the

United States, where climate change is presented as more controversial and theoretical than it is in news media in Europe and elsewhere (Marisa Dispensa & Brulle 2003). This is supported by research that suggests an “echo chamber” effect for media about climate change, wherein partisan media tends to strengthen the beliefs of like-minded audiences (Carmichael, Brulle, & Huxster 2017).

What the research in this section demonstrates is that there been a concerted effort on the part of the conservative movement in the United States to resist environmental regulation. One of the major methods for doing so is through the denial of climate change as a real problem. Although the “trickle down” of this perspective from conservative elites to the voting base of the Republican Party is somewhat complex, the major theme in this literature is that climate change denialism and general resistance to environmental regulation is a common conservative perspective. Scholars in this area of research point to this phenomenon as a major force of anti-reflexivity and argue that it serves the interests of the wealthy. Many scholars make similar arguments about the agricultural sector.

### *Sociology of Agriculture & Food*

The literature in environmental sociology criticizes the conservative movement in the United States for its denial of environmental science in favor of profits for large corporations. Likewise, scholars who study the sociology of agriculture and food (SAF) criticize the social and environmental consequences of industrial agriculture while promoting alternative systems including local and organic food production. Some of the literature in this field utilizes ideas

from the field of science & technology studies (STS) to critique the knowledge-production system in industrial agriculture and promote alternative ways of knowing and growing.

Critics argue that the industrialization of agriculture has created a system that is both environmentally unsustainable and damaging to human health. Guthman and Dupuis (2006) argue that the contradictions inherent in the neoliberal era are literally embodied in the epidemic of obesity in the United States. The authors point out that the industrial agriculture system creates a global oversupply of cheap, highly processed, and nutritionally deficient foods. This contradiction is resolved by shifting it into bodies in the form of obesity. The solutions offered to this problem are not about consuming fresh fruits and vegetables, but to further commodify dieting by selling highly-processed, low-fat substitutes as “diet food.”

Given the criticisms of the dominant, industrial agriculture regime, a significant movement has developed toward building an alternative paradigm. In the development of an opposition to the so-called conventional farming system, many have pointed to consumption politics as a path forward. Though some have been cautious of the ability of a consumption-based movement’s ability to challenge the dominant agri-food complex (e.g., Buttel 2000), DuPuis (2000) argues that consumption politics (using the anti-rBGH movement as a specific example) is a new form of politics she calls “reflexive consumption.” Despite the movement’s lack of organization and ultimate lack of success in this case, DuPuis (2000) argues that it remains an important act of social resistance. Knowledge systems, including both the consumer’s knowledge of agricultural growing practices as well as the knowledge of the farmers themselves are critical to share in order to awaken the consumer and de-fetishize agricultural production. Knowledge, made material in food labels, involves significant political

struggles but also has the potential to develop new notions of politics involving both sales and non-sales (i.e., consumer boycotts) that may not result in a Marxist overthrow of capitalism but may allow for a Gramscian “war of positions” in which a farmer-consumer alliance is forged (Goodman and DuPuis 2002). In the late 1990s and early 2000s, the focus for many scholars in terms of potential for the development of an alternative agriculture driven by the politics of consumption was the organic movement. According to Goodman (1999), the dualist ontological separation of nature and society that is essential to industrial orderings of eco-social relations in the modernized agriculture industry is opposed by the bio-politics of food as expressed in the organic movement.

As will be explored in greater detail in the following section, despite organic labeling occupying the main thrust of the alternative agriculture movement, many alternative farmers go beyond the requisites of the organic label. Although the particular goals and characteristics of the alternative agriculture movement are heterogenous within the movement, the general outlines were outlined by Kloppenburg et al. (2000):

- |                                    |                           |
|------------------------------------|---------------------------|
| 1. ecologically sustainable        | 7. sustainably regulated  |
| 2. knowledgeable and communicative | 8. sacred                 |
| 3. proximate                       | 9. healthful              |
| 4. economically sustaining         | 10. diverse               |
| 5. participatory                   | 11. culturally nourishing |
| 6. just and ethical                | 12. seasonal/temporal     |



13. value-oriented (associative)

14. relational

economics

As part of the project of developing alternative agricultural forms, Kloppenburg (1991) points to the dual task of deconstructing agriculture as currently constituted and reconstructing alternative solutions. Against the reductionist and positivist perspective of the mainstream agricultural science of the land grant universities, alternative agriculture needs to be constructed from alternative agricultural knowledge, with farmers being considered both generators and sharers of knowledge. Kloppenburg (1991) argues that the problem with actually existing science is not that it is false, but that it is partial and that we can use perspectives such as feminist standpoint theory to improve our knowledge. For example, this type of knowledge is shared extensively in a horizontally-organized networks of alternative “grass farmers,” who rotationally graze dairy cows on perennial polyculture pastures rather than confining them to barns to feed them corn and alfalfa (Hassanein & Kloppenburg 1995).

Kinchy continued to develop the connection between the production of scientific knowledge and the alternative agriculture movement in her studies of transgenic maize in Mexico and Canada. Building on Eyerman and Jamison’s (1991) theory of cognitive praxis, Kinchy (2010a) argued that social movements are shapers of consciousness and public spaces in which knowledge is produced. Anti-GE maize activists in Mexico, having discovered the presence of transgenes in native maize, used what Kinchy calls the “epistemic boomerang” to utilize scientific experts outside the national field to put pressure on the national government (Kinchy 2010a). By mobilizing to participate in a meeting of the Commission for Environmental

Cooperation established by NAFTA, activists were able to reframe policy problems beyond a scientific and technical perspective to include social issues (2010b).

As implied by the discussion above, movements opposed to GMOs are necessarily international and have achieved varying levels of success around the globe. The most striking difference is between the U.S., which has very little regulation over GMOs (and that which exists is mostly at the regional or state level), and Europe, where major food retailers have committed to avoid GMOs and national governments as well as the EU itself have committed to restricting approvals of GMOs (Schurman & Monroe 2013). Schurman (2004) argues that a major reason for the success of the anti-GMO movement in Europe is that the concentration of the food retail sector and presence of high-quality store brands resulted in an effective leverage point for activists. In addition, whereas Monsanto and other biotech corporations were well-integrated in U.S. society, the incursion of these corporations in Western Europe was seen as aggressive and arrogant, and thus incurred resistance (Schurman and Monroe 2013). Finally, Clancy and Clancy (2016) argue that scientific narratives and rationalist claims about the safety of GMOs made by government and industry scientists were explicitly thwarted by the anti-GMO movement through the sharing of viral memes on the Internet (e.g., “Frankenfoods”).

Regardless of international regulations, in order for scientific and technological advances to be profitable, they must be adopted by farmers. In terms of research on the adoption of science by farmers in the United States, much emphasis has been put on the role of trust and personal experience in both the adoption of sustainable agriculture and belief in climate change. Carolan (2006) found that farmers who transitioned from conventional to sustainable forms of agriculture did so as the result of knowledge shared through local social

relations. Although farmers recognize that the industrial farming system can disadvantage them, Bell (2004) argues that a main impediment to transitioning to sustainable forms of agriculture is the identity built into conventional agriculture. Often as a result of serious economic stress, farmers who transition to sustainable farming usually experience a “phenomenological rupture,” in which they come to reinterpret their agricultural practices with environmentalism in mind (Bell 2004). Holloway (1999) emphasizes that farmers distinguish between local and “distant” forms of scientific knowledge. Although they often accept highly scientific claims made by agronomy professionals and scientists from agriculture extension offices, these sources often are not experts on the issue of climate change. Rather, the information farmers receive about climate change is often vague and already filtered through media sources. Ultimately, farmers come to construct their knowledge about climate change around their more locally embedded knowledge, rather than simply recognizing it as an external force with straightforward impacts on their farming system (Holloway 1999).

STS research regarding the public understanding of science provides a convergent picture regarding the importance of local knowledge that is embedded in local agricultural practices and networks. The broad perspective within STS that deals with interweaving of technology, nature and society is called the sociotechnical perspective (for more on this, see Hughes 1993; Callon 1995; Scott 1995; Geels 2010). Within this perspective, Brian Wynne (1992) showed that Cumbrian sheep farmers were able to recognize that scientific knowledge from researchers failed to consider local variations that the farmers were intimately aware of in the context of their sheep being exposed to radiation. Importantly, whereas the farmers were able to reflexively engage with their own knowledge and accept where it had limitations, the

research scientists were unable to see the ways in which the localized knowledge of the farmers could benefit the scientific research. Furthermore, Wynne (2006) argues that science and policy bodies rely on risk assessments that are modeled on simplistic understandings of society that assume support for policies that have been determined scientifically. He argues that the risk-centered stance of policy and scientific elites fails to allow for alternative views and is the cause of mistrust in science, rather than broad public ignorance. Thus, he criticizes the “deficit model” that holds that the rejection of scientific knowledge by laypeople is wholly due to ignorance and that the solution is better conveyance of scientific knowledge. Instead, he argues for a process that integrates expert knowledge with local knowledge in ways that build credibility, trust, and more appropriate policy solutions.

#### 1.4.4 Fuzzy Polarization: Overlaps & Fragmentation

The literature above presents a picture of the social world as polarized. On the one hand, these scholars see dominant institutions that serve the interests of the wealthy and powerful through the denial of climate change, the industrialization of the agricultural sector, and the centralized production of knowledge that supports such institutions. On the other hand, the literature point to various groups that have resisted such dominant institutions, from environmental activists and indigenous farmers to organic labelers and community supported agriculture groups.

This study does not seek to correct such a perspective. In many ways, much of this study supports an understanding of agriculture as a polarized field and as a competition between the logics of industrial and ecological agriculture. However, there is also research that

argues that we can understand polarization as more complex than the clashing of two monoliths. Indeed, although political conservatives have been caricatured as climate change denialists, recent research points to significant variation in perspectives on climate change within conservative groups. Likewise, critics of the organic movement and of political liberals argue that when such groups fail to engage an ethic of reflexivity, they join their conservative counterparts in denialism. Research in STS points to the importance of social factors in the development of scientific knowledge. Despite criticisms of the concept of symmetry in STS, I argue that the politicization of scientific research demonstrates the importance of considering such factors, particularly when studying the public understanding of science.

### *Divided Conservatism*

Based on the observation of Republican legislators passing renewable energy laws, as well as the existence of clean-energy conservative groups, Hess and colleagues (Hess & Brown 2017; Hess et al. 2016) develop what they call the “divided conservatism” thesis. Hess et al. (2016) examined a data set of renewable energy and energy efficiency (REEE) laws in the United States, combined with qualitative interviews with state legislators from around the country. The authors argue that when carefully-selected REEE policies are framed with conservative ideologies in mind, Republican legislators tend to perceive them more favorably and often vote for them. State legislators point to REEE laws that involve tax cuts, deregulation, opposition to government mandates and cost increases, and support for business development as ones that they are likely to support because they are in line with their own ideology. REEE laws from 2004-2014 with the highest support from both parties included net metering, solar tax credits, and government building efficiency requirements. This is in comparison to laws that require

new REEE portfolios, which received the lowest levels of support from both parties. By taking political ideology out of a black box rather than simply treating it as a dichotomous variable in a statistical analysis, the authors argue that they are able to develop a more complex theoretical approach to the role of ideology in the politics of environmental and energy policy (Hess et al. 2016).

This pattern continued in a project that examined what Hess and Brown (2017) call the clean energy conservative (CEC) counter-counter-movement. Partly as a dissenting response to the alignment of other conservatives with support for fossil fuels, a variety of CEC organizations have grown, indicating the need for attention to divisions among conservatives on energy and environmental policy. While the specific reasons given by CEC organizations are diverse, from consumer interests to desires for small government, all use conservative frames such as free markets and opposition to taxes as key parts of their motivational framing. These groups are part of the broader conservative movement, but are also creating divisions within it, producing a counter-counter-movement (Hess & Brown 2017). Moreover, various young Republican organizations on college campuses have joined the coalition Students for Carbon Dividends, which endorses the moderate conservative climate plan known as the Baker-Schwartz plan (Meyer 2018). In order to achieve successful climate policy, it will be important to understand and work with divisions within conservative politics in the U.S.

In addition to the point that Hess and colleagues make that there are variations among conservatives in terms of opinions about climate change as well as variations among conservatives in terms of support for environmental legislation, recent evidence shows that conservatives can significantly change their beliefs about climate change after being exposed to

the statistic that 97% of climate scientists have concluded that human caused climate change is happening. After this effect (known as the Gateway Belief Model or GBM) was proposed by van der Linden and colleagues (van der Linden, Leiserowitz, Feinberg & Maibach 2015), it was supported by a nationally representative sample in a follow-up study (van der Linden, Leiserowitz, & Maibach 2019). The GBM describes a process of attitudinal change where a shift in perception of the scientific consensus on an issue leads to subsequent change in attitudes. That is, the authors argue that sharing the statistic that 97% of climate scientists have concluded that climate change is happening and is caused by human action encourages people to change their own perception of the consensus on climate change, then leading to changes in cognitive and affective judgments about climate change. These changes, in turn, are associated with changes in support for public action on climate change. In the follow-up study, van der Linden et al. (2019) found that conservatives and climate change disbelievers were the most likely to update their beliefs toward the consensus. The authors point out that this may be a result of a ceiling effect for liberals (exposure to information on the consensus on climate change doesn't increase perceptions of a consensus for liberals because it is already high for that group). However, they also argue that conservatives' willingness to update their beliefs about the scientific consensus may be a result of the fact that scientists are often a trusted and non-identity-threatening group. This also suggests a lack of exposure to the scientific consensus on climate change among conservatives, further emphasizing the importance of media and misinformation (van der Linden et al. 2019).

In addition to individual demographic and political characteristics, Hamilton and colleagues have shown regional differences to be an important factor in determining opinions

about climate change. Snowy areas of one 2007 survey were the most likely to perceive climate change as real and serious. The results of the study showed that respondents from areas with sharp increases in winter temperatures were the most likely to perceive climate change as dangerous. This was true even after controlling for demographic, socioeconomic, and other ideological predictors. The authors argue that these results indicate the importance of local weather on perceptions of global climate change (Hamilton & Keim 2009). In addition, rural areas that experienced rapid development were more likely to favor rules that used environmental reasoning to restrict development. Conversely, rural areas with high unemployment were more likely to favor using resources to create jobs in the immediate future rather than conserving them for future generations. The authors argue that these findings suggest that rural residents value environmental protections, particularly when used to defend against the invasion of urban development, but when faced with the realities of economic hardships, environmental values become a lower priority (Hamilton et al. 2010). Broadly, these findings demonstrate that the contingencies of life in a geographically-situated place affect the way individuals perceive climate change. Although extreme weather events may not have broad effects on public perception (as shown by Brulle et al. 2012), changes in more meaningful patterns of weather in a local area may be more readily connected to climate change by the people living in that area. Furthermore, similar to Brulle et al.'s (2012) point in the case of media coverage, concerns about employment and development compete with environmental issues for the attention of various publics.

The literature above demonstrates the important variation within the political right on environmental issues. Although ideology remains a major factor in influencing opinions on



climate change, a broad range of factors also play important roles. Furthermore, ideological entrepreneurs within the conservative political sphere are attempting to address climate change in ways that are consistent with a conservative worldview. When packaged in a manner that aligns with conservative beliefs, environmental regulations can receive support from both Republican politicians and voters. The point here is not to deny that environmental politics remain polarized. Rather, these scholars point out the ways that environmentalism and conservatism can be compatible and that there are points of agreement between the left and the right on environmental issues.

### *Fuzzy Denialism*

The implication of divisions within conservative circles as well as potential levers for influencing right-leaning individuals is that certain actions could be taken to counteract the anti-reflexive power of conservative climate change denialism. However, Kari Norgaard (2011) points out that even those who believe in the science of climate change and agree that steps must be taken to ameliorate it continue to live their lives as if nothing had changed. Members of the Norwegian community that Norgaard studied accepted the reality of climate change and yet failed to act either in their own lives or on any political stage. In what Norgaard calls “implicatory denialism,” advanced societies are able to create a cultural double reality in which climate change is pushed outside of everyday consciousness in order for people to be emotionally insulated from the guilt of participating in environmental destruction (Norgaard 2011).

Although the divided conservatism thesis implies a path forward for meaningful environmental policy, Norgaard points out that denialism is not reserved for the political right. Furthermore, she demonstrates that the acceptance of climate science by the political left does not and has

not necessarily translated into action to stop or ameliorate the effects of climate change.

Finally, Norgaard emphasizes that implicatory denial happens not because individuals are lazy or selfish, but because they seek to protect themselves from the negative emotions associated with environmental destruction.

Furthermore, although many have pointed to the organic movement as the main and most successful manifestation of the logic of ecological agriculture, many have pointed out failures of the organic movement. In fact, there are broad criticisms of the organic food movement, both from SAF scholars as well as within the movement itself. In Obach's (2015) book on the history and divisions within the organic movement, he delineates two types of organic activists – the spreaders and the tillers. While spreaders seek to rapidly grow the organic movement and value the role of the USDA in addressing flaws in the previously private certification system, tillers feel that the transformative potential of the movement was lost through the involvement of big organic businesses and the federal government. Furthermore, Guthman (2014) points out that although the discourse of the organic movement says it supports complex natural systems while embracing self-sufficiency in food production and consumption while also addressing social issues, it often becomes a variant of agribusiness through the process of conventionalization. The regulatory system, influenced by agribusiness, focused on standards in terms of inputs not used, rather than processes associated with agroecological farming, resulting in organic agribusinesses simply substituting inputs not on the banned list. Furthermore, Guthman discusses the process by which organic agriculture has underpinned the exploitation of labor by increasing land values, a conversation that is neatly excised from the popular discourse of organics (Guthman 2014).

In a more direct indictment of the ability for organic production to mend the dualistic rift between nature and society through sustainable production, McGee (2015) has shown that increases in organic farmland from 2000 to 2008 is positively correlated with greenhouse-gas emissions from agricultural production. This “displacement paradox” may be a result of supply stimulating its own demand, thereby increasing overall production. Whatever the case, it is far from clear that organic agriculture is beneficial socially, politically, or environmentally, despite the original goals of the movement. These findings were recently bolstered by research that conversion to organic methods in England and Wales will likely result in increased greenhouse-gas emissions, mostly as a result of predicted shortfalls in local production, leading to the need to import food with higher embedded levels of greenhouse-gas emissions (Smith et al. 2019). While industrial agriculture is environmentally intensive, high levels of yield means that the environmental footprint of each industrial agriculture product is relatively small. As organic production does not have the same high levels of yield, it may have a higher environmental impact per product, particularly if produced in a manner that mirrors industrial production.

In addition, although some of the main claims of the alternative agriculture movement have to do with the environmental and health impacts of agricultural pesticides and genetically modified organisms (GMOs), these claims clash with what some would call “mainstream science” (EPA 2013, 2019). For example, the EPA has regulated GMOs as equivalent to traditionally-bred plants and considers glyphosate (the most common herbicide used in global agriculture) to be “not a likely carcinogen,” (EPA 2013, 2019). However, the regulation of GMOs in Europe has been much more active, and the International Agency for Research on Cancer (IARC – a division of the WHO) has determined that glyphosate is “probably carcinogenic to

humans” (IARC 2015), leading to its ban in much of Europe. Moreover, although many have advocated no-till agriculture (the practice of planting without the use of plows) as one solution to climate change due to its ability to capture carbon in the soil, many farmers rely on pesticides in order to be able to practice no-till. Finally, although the proliferation of patented GMO seeds can cause farmers to become dependent upon large agribusinesses, there are other models of GM crop development. For example, golden rice is a publicly-developed rice that is genetically modified to produce beta carotene and has promise to alleviate blindness in the developing world that results from Vitamin A deficiency. In addition, the development of rainbow papaya virtually saved the papaya industry when the ringspot virus threatened to wipe it out.

This literature points to the challenges of simply replacing the logic of industrial agriculture with the logic of ecological agriculture. While the intentions of organic producers may be noble, they also exhibit Norgaard’s version of denialism if they fail to recognize when the organic juice isn’t worth the environmental squeeze its production puts on the planet. Likewise, it remains to be seen whether the rejection of GM technology is a step toward long-term sustainability or the manifestation of an “anti-science” perspective from the political left. The conclusion of this is simply that although the conservative, conventional end of the agricultural spectrum certainly is imbued with much of the denialism discussed by McCright, Brulle, and others, the alternative, progressive end is also awash in contradiction, fragmentation, and denialism.

*STS, Symmetry, & Post-Truth*

In addition to the literature mentioned in section 1.4.3 on the contribution of ideas from the field of Science and Technology Studies (STS) to our understanding of industrial and “alternative” agriculture, there is more general research in STS that analyzes the impact of social factors on the knowledge produced by scientific inquiry. This area of research often attributes its origins to critiques of an institutional approach to the sociology of science exemplified by Robert Merton. For example, he demonstrated the “Matthew Effect” in science, whereby early success in scientist’s career leads to greater access to resources, contributing to further success (Merton 1968; 56). Studies of the sociology of scientific knowledge, such as ethnographic research on laboratory environments, have demonstrated that despite broadly using the scientific method, different disciplines generate radically different “epistemic cultures.” For example, whereas high-energy physics researchers collaborate in large teams and engage in extreme levels of analysis and reflection with precise instruments, statistics, and theories, molecular biologists work in smaller teams, emphasizing direct experience with natural objects and experiments (Knorr-Cetina 1999). In general, this area of literature has not intended to argue that science is wrong, but that social factors outside science affect the way that scientists perceive reality. Indeed, by recognizing and addressing the instances where the institutions of science are socially situated, science itself can be improved through what Harding calls “Strong Objectivity” (1993; 49).

Despite insistence by STS scholars that they want to improve science, the field has recently been criticized as contributing to what has come to be known as the “post-truth era.” In particular, critics argue the concept of symmetry allows for any interpretation of reality as valid (Fuller 2016; Collins et al. 2017). Symmetry as a concept was originally postulated by David

Bloor (1976) as a “style of explanation” through which STS could engage with the contents of science and mathematics. In the explanation of the success of a particular position in a scientific controversy, the concept of symmetry (and its related principle, “impartiality”) holds that the same types of explanation should apply to knowledge that is accepted today as true and false. In other words, one should not explain successful science as a result of having a more truthful depiction of reality. Rather, a symmetrical explanation of a historical scientific controversy recognizes the importance of both evidence and social factors in the explanation of both successful and unsuccessful positions in a scientific controversy.

In the context of the late 2010s and early 2020s, some scholars have connected the concept of symmetry to the so-called post-truth politics embodied in the Trump campaign and presidency, the Brexit vote, as well as a host of other political events around the globe. Such scholars argue that the discipline of STS must claim responsibility for the proliferation of the concept of symmetry into the post-truth politics we see today (Fuller 2016). Likewise, Collins et al. (2017) argue that the skepticism toward experts that we now see so frequently is a result of the democratization of science that was argued for by scholars who followed the logic of symmetry.

Many scholars in STS have come to the defense of the discipline in this matter. Michael Lynch points out that it is “the height of hubris” to think that the discipline of STS would have such an impact on global political rhetoric (597). Furthermore, Sismondo (2017) argues that encouraging epistemic democratization does not have to mean throwing the baby of technoscientific knowledge out with the bathwater of pure rationalism in the explanation of scientific controversies. Rather, the concept of symmetry and the discipline of STS in general

seeks to show the requisite infrastructure, effort, entrepreneurship, and validation structures necessary for the success of scientific positions (Sismondo 2017). Fujimura & Holmes (2019) argue that the discipline of STS uses the techniques of scientific analysis to adjudicate evidence and epistemologies in order to contribute to the improvement of scientific knowledge. In contrast, post-truth attacks on expertise are strictly about promoting a particular group's political and economic interest.

In addition, several scholars have pointed to the phenomenon of post-truth politics as a tool for furthering the discipline of STS. By exploring the methods by which ignorance is produced both within the scientific field and among the public, we might come to a deeper understanding of how power works to shape scientific knowledge (Hess 2019). What the phenomenon of post-truth politics demonstrates, if nothing else, is that the public's understanding of science is influenced by factors far beyond the relative evidential merit of scientific positions. Whatever the merits are of the science on climate change, fertilizer runoff, and biofuels, the politicization of these issues demonstrates that scientific evidence alone does not resolve controversies. In the context of this study, I intend to approach conflict between the logics of ecological and industrial agriculture without the assumption that one side is more "anti-scientific" than the other. Rather, this study seeks use the concept of symmetry to deepen our understanding of the politics of science studying the way that science (and anti-science) is used as a rhetorical strategy by opposing political actors.

#### 1.4.5 Summing Up: Fuzzy, Reinforcing, & Polarized Logics

The literature above lays out the background for what this project seeks to understand. On the one hand, American society in general is in a period of increasing polarization in all areas of life. The population of this country is becoming increasingly divided on issues as fundamental as the nature of the climate and the proper method for feeding itself both now and into the future. This perspective is supported by a host of social science research. Across racial, geographic, and socio-economic divides, Americans seem incapable of agreeing with one another on the best path forward. In the realm of agriculture, this translates as opposing approaches to the essential job of producing food and fiber for the population. Here, we have conceptualized this dynamic as the clash of competing agricultural logics. Although the logic of industrial agriculture constitutes the dominant logic within the field, the logic of ecological agriculture has gained recent popularity through the emphasis of eco-conscious consumers and producers.

On the other hand, perhaps the emphasis on the clashing of monolithic, polarized enemies leaves us with only part of the picture. It may be the case that although the polarized perspective is accurate, it is also partial, and misses important layers of fuzziness. For example, we have seen that although ideology plays a major role in determining how individuals think about climate change, it is not the only factor. When crafted in a way that is consistent with conservative perspectives, climate policies can be a unifying, rather than dividing topic. Furthermore, in addition to deep divisions between right and left in the United States, there are also fragmentations within each pole. This is also the case in agriculture, as a variety of progressive critics have argued against the legitimacy of organic agriculture while a strong contingent within industrial agriculture have begun to move toward more sustainable practices.



If this is the case, what implications does it have for the literature on institutional logics?

Again, the intent is not to rewrite any of the work that has done previously. Rather, I seek to add to that research by demonstrating the intricacies within the competition between two opposing institutional logics. First, what are the specifics of the battle between the logics of ecological and industrial agriculture? What are the particular topics that ecological and industrial farmers disagree about and how do those disagreements contribute to defining the logics themselves? As such, the first research question is as follows:

Research Question 1: In what ways are the logics of industrial and ecological agriculture polarized?

The specifics disagreements between the logics of ecological and industrial agriculture constitute the grounds over which the battle is fought. However, that does not necessarily mean that every individual who operates within each logic holds every position in common. Just as the identification with any group does not imply the wholesale adoption of every single perspective of the other members of that group, ecological and industrial farmers are not necessarily monolithic in their thoughts about agriculture. The implication here is that although the institutional logics perspective creates a typology, there is likely to be fragmentation within the poles. As such, the second research question is as follows:

*Research Question 2:* In what ways are the logics of industrial and ecological agriculture fragmented?

When imagining competing institutional logics, the tendency is to suppose that the supplanting of one by the other implies a complete overhaul in the dynamics of the field.

However, in order to constitute a challenge to the dominant perspective, competing institutional logics must adopt at least some of the perspectives of the dominant logic. In other words, some areas of common ground are necessary in order for a coherent clash between institutional logics to occur. As such, the third research question is as follows:

*Research Question 3:* In what ways do the logics of industrial and ecological agriculture overlap with each other?

Finally, when discussing competing institutional logics, the assumption is that one logic will eventually defeat the other and become the solitary logic in the field. In many ways, though, logics are defined by what they are not. How do industrial farmers define themselves by pointing out the ways that they are different from ecological farmers? What about vice versa? In many ways, the competition between the logics of ecological and industrial agriculture animates much of the behavior and identities of the farmers themselves. As such, the third research question is as follows:

*Research Question 4:* How does the competition between the logics of industrial and ecological agriculture persist and reinforce the stability of the field?

## 1.5 Method

In order to answer these research questions, I conducted 51 interviews with persons working in agriculture in the state of Michigan. The majority of my interview subjects were farmers. In addition, I also interviewed a small number of participants employed in fields adjacent to

agricultural production, namely agents of chemical companies and academics in agricultural extension departments at universities.

The state of Michigan was chosen as the research site for several reasons. The first is that Michigan provides a unique theoretical vantage point from which to view the polarization and scientific controversies this study will address. Having once been a stronghold for the labor movement and a national center for industry, the state is illustrative of the Rust Belt politics seized on by the 2016 and 2020 Trump presidential campaign. After voting for Obama in both 2008 and 2012, the state helped Trump to victory in 2016 before going blue again in 2020. Large expanses of rural space dominated by conservative politics and industrial agricultural practice is punctuated by progressive urban spaces around Detroit, Ann Arbor, and Grand Rapids, all of which have been at the forefront of ecological food production and progressive politics more broadly.<sup>6</sup> This combination of conservative and progressive politics made for a lively political atmosphere, particularly in the context of the 2020 presidential election. Furthermore, while many of the studies mentioned above chose “heartland” states such as Kansas, Missouri, Iowa, and Nebraska as sites for studying agriculture, the Northern Midwest remains a powerful and somewhat overlooked agricultural region. In particular, Michigan leads the nation in bean, asparagus, and cherry production and also ranks sixth in the nation for dairy production despite a shorter growing season than more Southern states (USDA 2019). In addition, although Michigan is somewhat marginal in the national agriculture industry due to its shorter growing season, the sub-optimal growing conditions may actually heighten farmers’

---

<sup>6</sup> This includes being the tenth state in the country to legalize recreational marijuana, as well as electing one of the first Muslim women to serve on the US House of Representatives.

recognition of their relationship to the natural environment. Finally, although the southern part of the state is dominated by conventional agriculture and industrial activity, the northern reaches have large swathes of public land for recreation as well as access to the Great Lakes. This tension between valuing the natural environment for its recreational purposes and valuing land for its ability to yield agricultural goods and facilitate industry adds to Michigan's unique ability to speak to the issues of this study.

The interviews were directed by the interview guide provided in Appendix A. The interviews were semi-structured, meaning that the interview guide will serve as a general structure, while leaving room for exploration of topics with participants as they arise. The interviews will be generally divided into three domains, each corresponding to the areas of literature listed above: 1) perceptions and practices related to environmental issues, 2) perceptions and practices related to alternative forms of agriculture, and 3) perceptions and practices related to scientific knowledge.

In addition to the questions described above, respondents were asked to describe general demographic and farm characteristics. In all sets of questions, the interview guide provided space for drawing out connections between the answers provided by the participants and larger issues.

### *Sample Stratification*

The main dimension along which this study sought to recruit participants is from those guided by the logic of industrial agriculture to those guided by the logic of ecological agriculture. Although many of the participants fell somewhere between the two extreme poles on this

continuum, the sample was divided approximately in half, such that 26 participants fall closer to the industrial pole, and 25 fall closer to the alternative pole. This strategy oversamples from the alternative end of the polarity relative to the population.

A number of other factors including gender, age, race, and product was considered when recruiting participants. According to USDA Census of Agriculture, about 62% of farmers (both conventional and organic) are men. In addition, although nearly 80% of conventional farmers are over the age of 45, only about 55% of organic producers are over the age of 45 (USDA, 2017). In order to ascertain a variety of perspectives, this study sought to recruit approximately 40% of the sample from farmers who are women and younger. Table 1 displays the stratification of the participants. Note that the gender and age portions of the table each sum to the total number of participants, as the sample will be stratified along the conventional-alternative polarity as well as both gender and age.

Table 1. Stratification of Research Participants (N=51)

|               | Conventional | Alternative |
|---------------|--------------|-------------|
| <i>Gender</i> |              |             |
| Men           | 70% (18)     | 52% (13)    |
| Women         | 30% (8)      | 48% (12)    |
| <i>Age</i>    |              |             |
| >45 years old | 54% (14)     | 52% (13)    |

|               |          |          |
|---------------|----------|----------|
| <45 years old | 46% (12) | 48% (12) |
| <i>Race</i>   |          |          |
| Black         | 1 (4%)   | 4 (16%)  |
| White         | 25 (96%) | 18 (72%) |
| Other         | 0        | 3 (12%)  |

Although the type of agricultural product was not a major focus, this study also recruited participants that represented the variety of agricultural products from the state of Michigan including the major cash crops in the Midwest (corn, wheat, and soybeans), as well as major fruit crops such as apples, blueberries and cherries. In addition, farmers who raise beef and dairy cattle as well as other livestock animals were also recruited. Participants closer to the alternative pole of the agriculture practice polarity produced a wider variety of crops and livestock. In addition, while the population itself is remarkably racially homogenous (over 98% white in the 2017 Ag Census), this study sought opportunities to interview racial minorities in order to capture a broad range of perspectives.

*Recruitment & Consent*

Although agriculture is practiced throughout the state of Michigan, the participants for this study were recruited from the Southern portion of the state including the “thumb” area, as depicted in Figure 1. This area constitutes the majority of agricultural production in the state (USDA 2017). In order to recruit producers at the alternative end of the polarity, I began with

online lists, including the Michigan Organic Food and Farm Alliance (MOFFA) list of Organic and Ecologically Sustainable Growers and Farms, as well as the list of farmer’s markets on Michigan.org. A sample of alternative farmers were selected from these lists and built upon using snowball sampling.

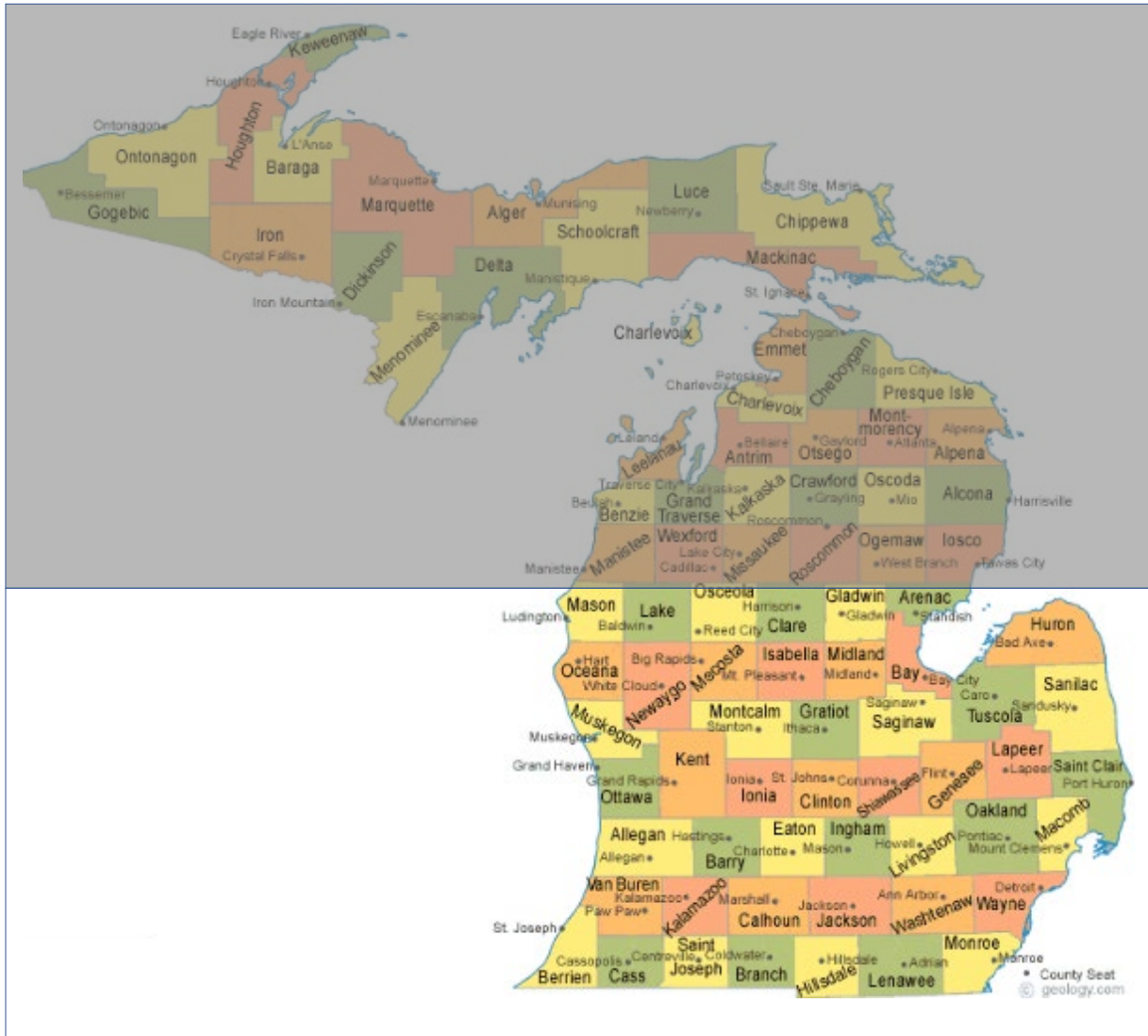


Figure 1: Recruitment Map (grayed out section not included)

The strategy for recruiting conventional farmers began with the “Michigan Agriculture Facts and Figures” pamphlet attached in Appendix B. Developed by the Michigan Department

of Agriculture and Rural Development (MDARD), this list compiles facts about the various agricultural products in the state of Michigan and their associated production organization. The production organizations for major agricultural products including corn, wheat, soybeans, beef, pork, and dairy were contacted in order to recruit participants. Participants from within the crop-production organizations were asked to provide additional contacts for recruits in their product area. In addition, while participant observation was not a major source of data collection for this study, I participated in a variety of virtual field presentations, agricultural conferences, and other events in the Michigan agricultural community in order to gather deep background information as well as develop relationships in order to recruit participants. Finally, I built on personal networks in Michigan agriculture to recruit participants.

## 1.6 Chapter Outline

The project proceeds with three major sections, each divided into three chapters. The first major section lays out the epistemic foundations for each agricultural logic. The first chapter of this section lays out the perspective of production science as manifested in the logic of industrial agriculture. The second chapter lays out the perspective of impact science as practiced within the logic of ecological agriculture. Each chapter includes a section on how each epistemic system understands its opposing system. That is, I discuss at length the ways in which the knowledge system of industrial agriculture critiques the epistemic foundations of ecological agriculture and vice versa. I conclude this section with an analysis of the fragmentations and overlaps in the knowledge systems within the logics of ecological and industrial agriculture. Whereas industrial and ecological farmers are sharply divided on issues including the ability for each logic to “feed the world” and the health impacts of various food systems, significant



fragmentation exists within each supposedly polarized logic. For example, significant variation exists among industrial farmers on the reality and danger of climate change. Likewise, there is significant disagreement among ecological farmers in terms of opinions on the health effects of GMOs. Importantly, farmers of all varieties found their identities as farmers to be an oppositional identity to the general public and felt a deep connection to the land they farm.

The subsequent sections follow the pattern of the first. In section two, I break down the politics within the logics of industrial and ecological agriculture. Again, I analyze the ways in which each side directly clashes with each other before concluding with the ways that the politics of ecological and industrial agriculture are both internally fragmented and overlapping. Politically, most industrial farmers fall on the conservative end of the spectrum while ecological farmers tended to be politically progressive. However, although some industrial farmers defended government supports for the agricultural industry, other saw it as “farmer welfare.” Likewise, despite the progressive leanings of most ecological farmers, several of them were enthusiastic supporters of President Trump. The main driver of this phenomenon seemed to be a support for populism that was common to all of the farmers I interviewed.

The final section lays out the economic systems of industrial and ecological agriculture. Although I once again address the ways in which the respective logics see each other, there is significantly less polarization in this section relative to the others. I conclude with a final section discussing the overlaps and fragmentations within the economic systems of industrial and ecological agriculture. The main economic difference between ecological and industrial farmers is scale. Whereas industrial farmers are selling a homogenized product on a global market, ecological farmers sell to local markets that include their neighbors and other community

members. However, both ecological and industrial farmers respected each other's business acumen and used similar strategies to command a larger portion of the customer's food dollar.

In the conclusion, I synthesize the results from the previous sections and draw conclusions to the research questions that were asked. Epistemically, politically, and economically, the logics of industrial and ecological agriculture present alternative sets of practices and symbols. They also are internally heterogenous and contain a multitude of similar perspectives. I suggest several avenues for future research and policy proposals as a result of the findings.

# Chapter 2: Knowledge

## 2.1 Knowledge within the Logic of Industrial Agricultural

Growing food has always entailed *knowing how* to grow food. That is, agriculture and knowledge have always been tightly intertwined. Likewise, technologies of food production have always been essential to the structure of civilizations. The shift, over thousands of years, from hunter-gatherer societies to agricultural civilizations involved massive changes in social structures. Furthermore, the building of industrial societies required<sup>7</sup> the development of matching agricultural science and technology. Feeding a growing population that was increasingly being displaced from the agrarian countryside into industrial cities required the application of Enlightenment ideas to develop new agricultural sciences. From those developments in soil science to today's GPS-guided tractors and genetically-modified seed varieties, modern science has been essential for a vanishingly small number of farmers to achieve their stated goal of "feeding the world."

In the late twentieth and early twenty-first century, however, a new type of science developed that has been distinguished from earlier forms in a number of ways. Using science to criticize the increasing use of agricultural chemicals, Rachel Carson was a harbinger of this new type of science. Pioneering environmental sociologist Allen Schnaiberg (1977) coined the term "impact science" to distinguish this type of science from the previous form—what he called "production science." For Schnaiberg, the latter is associated with laboratory-based and

---

<sup>7</sup> Scholars such as Ellen Maikins Wood (2000) argue that, in fact, industrial capitalism is built upon shifts in agricultural production.

quantitative scientific work and is fundamental for material accumulation and capitalist social relations. Conversely, the former is associated with qualitative field studies and seeks to measure the impacts of technologies of production. Similarly, the field of sustainability transition studies uses terms such as “incumbent” or “regime” science to designate that knowledge that is produced in the service of dominant institutions in society, in this case, institutions of capitalist production. Conversely, “challenger” or “niche” science is the equivalent of impact science in the sense that it seeks to use scientific methods to demonstrate the environmental and social ills of industrial production in the hopes of correcting them in the future.

On the one hand, Schnaiberg’s distinction between impact and production science underestimates the extent to which qualitative and quantitative methodologies are useful for both incumbents and challengers. For instance, business management research has made considerable use of ethnographic methods in office and factory settings in order to economize systems of production. Likewise, the field of environmental justice often uses statistical and spatial analysis methods to demonstrate disproportionately negative effects of environmental pollution on communities of color. On the other hand, the distinctions made in the sustainability transitions literature between challenger and incumbent science is most useful for demonstrating the strategic behavior of actors in a field. In this project, the primary focus is on the *goals* for which science is created and used (e.g., producing more food; generating a more sustainable food system), rather than explicitly on the ways in which power relations in strategic action fields shape the creation and use of science. As such, I will use the term “production science” to refer to scientific knowledge created and used in the drive to produce

ever-increasing amounts of both agricultural crops and profit. Conversely, I will use the term “impact science” designate scientific knowledge created to either demonstrate the environmental damage caused by industrial production or to generate alternative practices that prioritize sustainability.

These types of science constitute knowledge systems within competing institutional logics in contemporary agriculture. In the industrial agriculture logic, production science plays a key epistemic role. Farmers and agribusinesses use production science to create a knowable world that both legitimizes and achieves the goal of increasing production of agricultural commodities. Likewise, impact science plays a similar role in the ecological agriculture logic. Practitioners of ecological agriculture see their behavior as driven by the knowledge of the detrimental effects of industrial agriculture as demonstrated by impact science. Building on this critical knowledge, impact science seeks to pull from pre-industrial agricultural methods to build a system of sustainable agricultural practice.

In this chapter, I demonstrate the prevalence of production and impact science in the agricultural communities of Michigan. In the first section, I discuss the discourse and practice of production science arising from the logic of industrial agriculture, and I demonstrate the diffusion of this logic across among industrial farmers. I conclude this section with a discussion of the ways in which production science is used as a lens to criticize ecological agriculture, creating polarization. The subsequent section mirrors the first, demonstrating the practice and discourse of impact science within the logic of ecological agriculture, concluding with the polarization caused by using impact science to criticize industrial agriculture. In the final section

I argue that although the dynamics within the field can appear quite polarized, a more nuanced view recognizes the fractures and overlaps within and between each pole.

### 2.1.1 Production Science in the Discourse of Industrial Farmers

The experience of talking to farmers is a unique one. Whether operating mainly under the industrial or ecological logic, farmers often feel that they are in some ways separate from the rest of society. While much of the rest of society goes to work in air-conditioned office buildings, farmers often work in their own backyards, out in the fresh air and under the open sky. Farmers often said that they feel the weight inherent in providing food for the rest of the population. Although these dynamics exist across the agricultural spectrum, there are major differences between farmers who mainly practice under and industrial agricultural logic and those who practice ecological agriculture. These differences in discourse provides important insight into the ways that farmers think about the world around them and how they use the production science logic to justify their practices.

### *Feeding the World*

Part of the uniqueness of farming in the modern world is the extent to which farmers find that the rest of the world depends upon them. Industrial farmers that I spoke to consider themselves to be members of an elite group of agricultural practitioners that bear the responsibility of “feeding the world.” This notion is built on quasi-Malthusian reckonings of global population growth necessitating ever-increasing agricultural production. For these farmers, the work they do comes with the pride of providing for one’s own family while also

providing for everyone else's families. For some, this comes with the weight of feeling that the stability of society itself depends upon their production.

These notions often come in response to the recognition that collective maximization of production comes with a decrease in prices resulting from oversupply. As margins grow thinner, farmers seek to increase production in order to maintain profitability, generating further downward pressure on prices and causing a negative feedback cycle. However, when I asked Mark,<sup>8</sup> a 4<sup>th</sup> generation farmer in his late 30s about this, he felt it necessary for a larger purpose.

Yeah, it sucks for the farmer. Dairy's been hit the worst by it but it's in corn and everything, too. The thing is, I heard we're going to have nine billion people by 2050. Bayer says we're going to need to be producing at least 50% more corn, wheat, and soybeans by then to meet the demand. The only way to do it is to make more.

Critiques of this perspective abound and will be addressed in the following section. The point here is that Mark and many others found this argument to be based in reality. For them, an increasing population means more mouths to feed. Although their daily work is significantly separated from the food that goes into peoples' bellies, farmers legitimized the logic of production science partly through the need to feed a growing population.

For some, highly productive farmers are also contributing directly to both social stability and the productivity of the rest of the economy. Dave, a large-scale row crop farmer on the

---

<sup>8</sup> All names are pseudonyms.

West side of Michigan, made this abundantly clear when I brought up the challenges of low grain prices:

Do I love cheap corn as a farmer? No. But it's good as a consumer. Cheap food means I can spend my money on other stuff... Plus, if I can feed 100 people as a farmer, that means that 98 people can do stuff other than farm. Those people make computers, play sports, go to school... They do all the stuff that isn't farming. If all the sudden we're not producing enough food, well then you're really going to see some riots.<sup>9</sup>

Here, Dave expresses several concepts that are important within the logic of industrial agriculture. The first is the concept that cheap food is better for a consumer society. Cheap food allows a smaller percentage of a person's income to go to purchasing food, and therefore a larger percentage to go to other expenses. In fact, many industrial farmers recognized the somewhat contradictory nature of being a farmer and a consumer, as increases in prices for agricultural commodities is understood to be related to increases in food prices.

The second common concept shared by Dave in this quote is a concept usually referred to by the phrase "the number of mouths a farmer feeds." The concept itself is an interesting manifestation of the production science logic in which the ultimate consumer of agricultural production is disembodied—reduced to the relevant organ of

---

<sup>9</sup> This interview was conducted in the summer of 2020 amidst the social unrest stemming from the murder of George Floyd by Minneapolis Police Officer Derek Chauvin. Although using the term "riot" here in alluding to the protests, in the course of our discussion Mark expressed recognition of the validity of protestors' anger. This was not the case with all interviewees, many of whom were happy to share their condemnations of the movement.



consumption. Although Dave places the consumptive act within actual people, the sentiment remains much the same. In this conception of farming, the goal is to decrease the number of people farming in order to “free up” other people to do other work. In the words of former Assistant Secretary of Agriculture James Bostick people will be “freed from the drudgery” of farming through the industrialization of agriculture (Berry 1977).

Finally, Dave points out that in addition to allowing the non-agricultural population to pursue activities outside of food production, the industrial farming system creates dependence upon a complex food supply chain. The downsides to this reliance were observed in the early part of the COVID-19 pandemic when empty shelves appeared in grocery stores while farmers destroyed crops they had intended to sell to restaurants. The end of Dave’s quote indirectly referred to such supply chain issues as well as to the so-called “riots” occurring during the summer of 2020 in response to growing racial unrest. For Dave, such occurrences further demonstrated the importance of farmers.

For farmers, feeding the world is a badge of honor. Many farmers feel that they take on the drudgery of farming in their everyday lives, freeing up the rest of society to practice more glamorous professions. Although it can often feel like a heavy burden and farmers were not shy about expressing their dissatisfaction with how they feel the rest of society sees their sacrifice, they also truly value their work for the sense of purpose it gives them. A fourth-generation dairy and crop farmer named Glen told me he was getting too old to keep farming and would likely retire soon, ending the history of farming in his family as no one in the younger

generation were interested in continuing to work on the farm. When I asked him why he had yet to sell the farm, he had this to say:

Well, that's a good question. The price of milk's shit and no one's going to make much on crops with the amount of acres we run. But I still have to get up in the morning. Feeding these cows, baling hay, whatever we have to do for the day, it's got to get done. That's what farmers do. We get up early. We don't get paid very much. But somebody's got to do it. So why not me while I still can?

### *Views of Nature*

One of the most striking differences between ecological and industrial farming is the way in which farmers refer to the earth itself. I will discuss ecological farming in more detail in the next section, but for now, I will note that whereas ecological farmers favor the terms "soil" and "land," industrial farmers prefer "dirt," and "ground." For farmers following an ecological logic, referring to soil and land indicates an interest in the holistic, organic, and mutable nature of the earth out of which they make their living. Conversely, references to dirt and ground reveals the ways in which the industrial farming logic sees the earth as a substrate with measurable qualities that can and should be altered only to the extent that it suits the coming harvest.

Randy, a third-generation farmer in his late 20s, demonstrates this perspective while discussing how he and his family evaluate a new piece of property to potentially farm:

When you're looking at a new piece of ground, you have to think about what it's going to do for you. Is it muck ground? Is it sandy? Is it loam? Knowing

that will tell us if it's worth it to buy or rent it, what we want to pay for rent, stuff like that.

For Randy, the ground has particular characteristics that determine its value to him and his family. What farmers refer to as “muck ground” is highly fertile and capable of producing high yields, but also often drains poorly. Conversely, sandy ground might not hold as many nutrients, but will dry out more quickly after a hard rain. Either one can be highly productive when combined with proper management and appropriate weather. For example, a planting an expensive, highly-productive corn variety and applying a high rate of fertilizer in muck ground might result in particularly high yields in years with less rainfall. Conversely, in a year with more rainfall, a farmer can plant a more cost-efficient variety in sandy ground and save on fertilizer. Although the yield in the latter situation will likely be considerably less, the cost to the farmer is also likely considerably less. The point here is that the qualities of the ground determine which path the farmer is likely to take.

Whereas the term “ground” refers to an area of a farmer’s field, the term “dirt” refers directly to the substrate itself. Like ground, dirt has qualities that determine its value. In addition, it is the medium within which the industrial farmer does their work. Here, Aaron explains how he interacts with the dirt to maximize its potential:

Depending on what the dirt looks like, we’re going to do things a little different, right? If we know that dirt is going to be a little wetter, we might try to give it an extra pass with tillage to warm it up in the spring. If we know it can take a little more fertilizer, maybe we give it a little extra.

In the next section, I will describe the exception to this phenomenon: soil samples for industrial agriculture. In fact, whereas farmers operating under mostly an ecological logic almost exclusively referred to, soil industrial farmers restricted that term almost exclusively to the context of soil sampling. As we will see in the section discussing the ecological logic in agriculture, the term “soil” often comes with an understanding of it as a living being—a community of microorganisms that must be nurtured in order to facilitate plant growth. For ecological farmers, the relationship between themselves and the soil is an intimate one, built on years of dialogical relationship and support. In the context of industrial agriculture, soil samples are the most intimate form of knowledge that farmers have of the earth from which they extract a living. In this way, the exception proves the rule that industrial farmers consider the earth (dirt, ground) to be a substrate for manipulation and extraction *until* it becomes more intimately known through soil samples.

Several farmers also talked about staying ahead of pests in a race-like manner. Larry was particularly enthusiastic about the science produced by agribusinesses and agricultural science department in universities to keep pests at bay.

See, we’re only ever one step ahead, but we’re never going to fall behind. You might get some corn borer coming in – we haven’t gotten palmer amaranth yet, but we probably will. I’ve seen a lot of those [pests] come and go over the years but those guys [university and agribusiness scientists] are always staying ahead of it.

At the same time that Larry was confident about the ability of agricultural science to stay one step ahead of pests, he also recognized that using chemical pesticides has the potential to select for resistant pests:

We're getting more and more waterhemp that's resistant to Roundup. It's becoming a bit of a problem but the guy I talked to at [the university] said they'll have something to deal with that pretty soon... And all that is part of what makes farming fun, you know? You've always got something new to deal with.

For Larry, production science in agribusinesses and universities is powerful enough to allow farmers to keep growing within the logic of industrial agriculture. In this mindset, nature becomes nearly equivalent to an enemy combatant, throwing novel obstacles at farmers for the agricultural industry to overcome with production science. New pests may come in the form of insects, weeds, or fungi, but the response is likely to be a new chemical developed by scientists in either a university or one of the large agrichemical businesses. By working this new product into the farmers' practice (likely at a significant price), agriculture will be allowed to continue in an industrial fashion.

If taken at face value, the discourse demonstrated above may seem fairly commonplace. In fact, it is its everyday nature, particularly within the industrial agriculture community that makes it noteworthy in this case. The everyday conversations of farmers about their interaction with nature and the purpose of their profession demonstrates the assumptions underlying their worldview. In discussions of feeding the world, industrial farmers demonstrated that they see

themselves in a somewhat outsider fashion, providing for the rest of society while taking pride in putting up with the drudgery involved in agriculture. In order to do so, farmers rely on cutting-edge technology to keep an advantage in the ongoing battle with nature. The goal for these farmers is to quantify the qualities of the substrate in which they seek to grow food and strategize about how to maximize the substrate's efficiency while minimizing the encroachment of unwanted organisms. Through this type of discourse, the logic of industrial agriculture is legitimized to the farmers and revealed to us.

#### 2.1.2 Production Science in the Practices of Industrial Farmers

Of the twenty-six industrial farmers, twelve mentioned specifically that they use science nearly every day. For these farmers, the complex realities of farming are made knowable through scientific research and technologies. When profit margins are vanishingly small and the all-important factor of weather remains both difficult to predict and impossible to control, the right science and technology can mean the difference between a good year and going belly up. For farmers at the cutting edge of industrial agriculture, data collection, data management, and the right equipment are essential.

##### *Soil Sampling*

Much popular attention has been paid to the so-called Data Revolution. Companies around the globe constantly compete to either produce or access the newest stream of data. Agriculture is no exception. In order to improve yields, economize inputs, and make more money, industrial agriculture is seeking to make farming a data science. One third-generation farmer named Aaron owns an agricultural supply company in addition to farming himself. For the agricultural

supply company, soil sampling is a major earner. Farmers in the area will pay good money to Aaron to take soil samples in their fields. In practice, what this means is that Aaron (or one of his employees) drives into the farmer's field, following a GPS system to strategic points. At each point, Aaron gets out of his truck, and uses a small metal shovel that pierces into the ground in order to uproot a core 6-8 inches deep (preferably the same for each core) and an inch or so in diameter. In the strategic spot designated by the GPS system, he walks in a wide circle around his truck to get 8-10 cores from the same area. Each core is deposited into a bucket, which is then dumped into a small paper and plastic bag with a tag demarking its location and date. After the entire field is sampled in this manner (the fields are typically broken into 2.5-acre grids), the soil samples will be sent to a lab for testing. The farmer will then know the levels of the "primary nutrients," Nitrogen, Phosphorus, and Potassium (farmers universally refer to these as "N, P, and K," and are considered the most important for yield), along with levels of "secondary nutrients" including magnesium, calcium, boron and sulfur, organic matter, cation exchange capacity, and pH.

I asked Aaron if he would rather have soil samples or a long history of planting, harvest, and fertilizer practices when judging the quality of a piece of ground.

It's nice to know what's been done in an area, but nothing's better than knowing what's actually there. Yields are going to change just because of weather, there are a million different things that could be going on with stuff like that. If I know what's in the soil, that's the most important thing.

For Aaron (and his paying customers), sampling the soil using these techniques allows him to know the land *better* than he would if he knew exactly what had been planted on it and applied to it, and the resulting yields. In farming, the variables are almost always too complex to fully comprehend. Changes in pest or weed pressure, the amount and timing of sun, the amount and timing of rain, wind, equipment operators, and dozens of other variables may account for changes in yield from year to year. Soil samples, on the other hand, limit the number of variables a farmer has to take into consideration. Although samples have been shown to be seasonally variable, Aaron says it's manageable by trying to sample the same fields at the same point every year.

### *Yield Monitors*

In addition to knowing the quality of the soil, data collection systems on harvesting equipment allow the farmers I interviewed to know exactly how much corn, wheat, or soybeans were being produced in different areas of their field. With massive combine harvesters,<sup>10</sup> farmers are able to travel through fields at considerably faster than walking speed, harvesting a dozen or more rows of crop simultaneously. Riding in a massive 12-row combine with fourth-generation farmer Gary, I was able to witness the awesome power of this machine to collect data. Using high speed cameras trained on the incoming crop in conjunction with image-analyzing software, Gary is able to monitor the quality of the crop, how effectively the combine is doing its many jobs, and troubleshoot problems. In addition, he is kept constantly informed of the

---

<sup>10</sup> Usually referred to simply as “combines,” these feats of engineering combine reaping (cutting the crop), threshing (loosening the edible grain from the plant stem or straw), gathering, and winnowing (separating the edible part of the grain from the non-edible parts, known as chaff).



amount of grain in the hopper behind the cab, indicating how soon he will need to offload (typically while in motion; a ballet of over a million dollars in farming equipment, a second driver matches the speed of the combine and aligns a grain cart with the offload mechanism of the combine). Finally, using GPS, the machine records the quantity of grain collected in different parts of the field, which can subsequently be paired with equivalent data from soil samples, planting equipment, and fertilizer and pesticide applications. According to Gary, it's a lot of information, but it's important for making the best decisions.

It's a lot coming at you while you're driving this thing. But I know if I'm going too fast... if I need to change the settings on the sieves and stuff like that. The yield data is super important, too, to know whether we made the right calls on [genetic crop] varieties, fert (fertilizer), all the things we did throughout the season.

Whereas the soil sampling allows farmers to know the qualities of the soil into which they will be planting, data from harvesting equipment allow them to analyze the decisions that they made. As I sat in the cab of the combine with Gary, the amount of information coming at the operator felt like sensory overload. For the trained eyes of Gary, though, these data simplified his experience and made him a better farmer. By using computers to monitor the incoming crop at a rate far exceeding the ability of a human operator, the combine acts as a mediator of information from the physical world. The combine is able to monitor the multitude of changing variables in the field, made manifest in the crop itself, and ultimately (with the occasional assistance of the operator) optimize its operation to match the conditions.

Furthermore, the fine-grained yield data allow farmers to measure success and failure to a never-before imagined level of fidelity.

When I brought up the topic of data with farmers, most were enthusiastic about the possibilities these technologies opened up for the future of agriculture. However, almost all remained cautious in their optimism. This was especially true of older farmers, like Larry:

Everyone's talking data these days and it's great we can know so much. At the end of the day, it's got to *do* something for me, though. If it saves me money, great; if it gets me more bushels, great. But I can't just know stuff to know. It's got to make me money.

The collection of data through soil sampling and farm equipment is an important way that agriculture continues to modernize. However, without an ability to turn data into actionable decision points, data collection is an unnecessary expense. For agribusinesses, the solution to this problem has been to create platforms for making decisions about recommendations for genetic varieties, prescriptions for chemical applications, and staying connected through mobile apps.

### *Genetically-Modified Seed Varieties*

Major seed genetics companies in the United States include Bayer's subsidiaries Dekalb corn and Asgrow soybeans (both former subsidiaries of Monsanto), Corteva's subsidiary Pioneer (Corteva was spun off by DowDupont in 2018), Syngenta (purchased by the China National

Chemical Corporation in 2017), and Advanta Seed Group.<sup>11</sup> Each of these companies has a large catalogue of genetic varieties for farmers to choose from.

Dave, a third-generation row crop farmer on the west side of Michigan had this to say about the varieties of seed available to farmers:

You can pick different lengths of maturity,<sup>12</sup> different chemical resistance, pest resistance, what's good for different soils, all sorts of stuff. When you have that information from your soil samples and previous years' [applications and yield], you can pick what [variety] you think is going to work best this year.

For industrial farmers, decisions about which genetic variety to plant in which fields can be a major factor in each year's success. Dave told me he prefers to keep these decisions "in the family"—a sentiment shared by several other farmers. Doing so saves the expense of hiring consultants and keeps information and decision-making within the trusted family group. Alternatively, Aaron and his family collaborate with agronomists at Bayer who use sophisticated computer technology to negotiate the many factors involved in making planting decisions.

The Bayer guy looks at our data and gives us a recommendation for what to plant. But you're not always trying to win a yield contest, right? You're trying

---

<sup>11</sup> This list makes clear the connection between agrichemical companies and seed companies. In 2018, Bayer, one of the world's largest chemical and pharmaceutical companies acquired Monsanto, the world's largest seed genetics company. This relationship will be analyzed in more depth in the next section.

<sup>12</sup> This trait of seed varieties indicates the number of growing days needed for the crop to grow to maturity. In the relatively short growing season in Michigan, a crop that takes too long to mature may not have the number of days necessary to grow under optimal conditions, thereby limiting yield.

to make money. I might get ten more bushel[s] an acre if I plant this variety but if it costs me fifty extra bucks an acre for the seed and the chemical, I need to make that work... well corn's going to need to be five dollars a bushel for that to be worth it.<sup>13</sup> So they have an algorithm that's geared toward profit. Actually, we recently got into a beta program for this new algorithm where we share all our data and it makes seed recommendations that they guarantee will give us a certain amount of profit. Anything less than what they guarantee per acre, they make up. Anything above it though, we split the profit.

Using advanced genetic modification techniques, large seed companies create genetic varieties for a wide range of growing environments. Using the data collected from soil samples and previous years' yield monitors, farmers make decisions about which seed varieties to purchase and plant while juggling the goals of maximizing yield and maximizing profit.

### *Prescription Application and Variable-Rate*

In addition to providing a seed that is tailored to the growing environment, modern industrial farmers use complex technology to apply precise amounts and types of agrichemicals to their fields. As the previous quote from Aaron suggests, the profitability of a field depends on the combination of the right seed variety with the appropriate cocktail of insecticide, fungicide,

---

<sup>13</sup> In April of 2020, corn hit a five-year low of \$3.03/bu, mostly due to decrease in demand as a result of the COVID-19 pandemic. In late February of 2021, however, prices skyrocketed to around \$5.50/bu, resulting from increasing demand as pandemic restrictions eased combined with large purchases from China. Typical prices have bounced between \$3.50 and \$4.50/bu from 2016 to 2021. Large-scale farmers often use futures trading to deal with the uncertainty inherent in making planting decisions based on prices that could change dramatically by the time harvest comes. Corn commodity pricing will be discussed in greater detail in the section on economics.

herbicide, and fertilizer. Many seed companies develop traits for resistance to specific agrichemicals. For example, “Roundup Ready” corn seed from Bayer is resistant to glyphosate, the main ingredient in the company’s premier herbicide, Roundup. Farmers are thereby able to spray the product onto their fields to kill weeds without damaging the crop itself. Using the data from soil samples and yield monitors, however, farmers are able to spray pesticides and apply fertilizer only where necessary. For Eric, this allows him to minimize the amount of potentially dangerous chemicals he applies while maximizing his profit:

Look, I don’t love spraying that stuff. I don’t think it’s going to kill you, but it probably isn’t great for you either. With prescriptions and variable-rate, I only apply what the ground will take. That way, I feel good about not having those chemicals go into the water, and it saves me money.

This process requires both prescription and variable-rate technology. The former takes the data collected from soil samples and yield monitors to determine the appropriate amount of agrichemical for a given piece of land. Modern industrial farmers can then send their prescriptions to their variable-rate equipment (either a fertilizer spreader or a pesticide sprayer), which automatically alter the level of chemical applied as they drive across the field. In the process, industrial farming uses the logic of production science to maximize profit first and yield second.

Furthermore, as Eric implies, farmers feel that these technologies allow them to practice better environmental stewardship. Although never stated in these explicit terms, farmers generally thought that this allows the production science and impact science logics to be

compatible, rather than competing. In the drive to maximize profits, farmers use vast amounts of data and precise field-interface technologies to use inputs efficiently. Theoretically, this aligns the profit motivation underlying the production science logic with the sustainability motivation underlying the impact science logic. Many critics are skeptical of this claim. I will return to it in the final section of this chapter.

### *Gargantuan Farm Equipment*

Of course, the most physically impressive pieces of modern agricultural technology are the farm implements themselves. In the quest for efficiencies of scale, larger equipment means fewer passes in the field, which translates into less time spent in each field and opens up the possibility of expanding the acreage of the operation, either through purchasing or renting new land. Speaking with Linda, a fourth-generation farmer who started farming in the 1960s, the efficiency of the large equipment is the biggest change she's seen since she started.

See that field out there? When I started my dad might get that field harvested in the fall in a couple of days and feel pretty good about it. Now? Shoot it might take us half the morning... I remember when we *upgraded* to a 4-row combine and an 8-row planter. Now our combine's 16 rows and we have a planter that's 48 rows! I mean—it's crazy.

The 48-row planter that Linda referred to is 120 feet long when fully extended. Under ideal conditions, it can sow approximately 100 acres in an hour. The tractor pulling it is required to have at least 350 horsepower, although the one that Linda and her family uses has over 500, which she says is necessary for the way they use it. It is difficult to overstate exactly how

gargantuan these machines are. However, while being larger-than-life, they are also extremely precise. In the course of planting nearly 100 acres per hour, the planter Linda referred to will plant rows that are (as several of my informants said) “dead nuts” straight with tens of thousands of seeds per acre placed 1.75-2.25 inches below the surface and 3-4 inches apart. Combining massive scale with precise interface with the earth, these machines are the manifestation of the logic of production science and technology. No machines in history have matched their ability to produce agricultural commodities at scale.

### *Digital Farming*

In the collection and use of large amounts of data, the final piece of the puzzle are the digital platforms which support the farmers’ production. For users of Dekalb corn, Asgrow soybeans and Roundup pesticide, the solution comes from yet another Bayer subsidiary. Climate Corporation is Bayer’s “digital farming” wing and runs the app Fieldview, which allows soil samples, yield monitors, and variable-rate prescriptions to be coordinated from a single platform on their phones, computers, and tablets. The farmers who used Fieldview considered it essential to farming in the modern world.

As mentioned in the previous quote from Aaron, his family was involved in a program Fieldview that uses data contributed by farmers to recommend a seed variety, chemical regimen and schedule for planting and application. Aaron saw this technology as likely to replace his side job as a seed salesman but also the wave of the future: “It’s a little scary because we gave them a lot of our data and it gives them a lot of control over what we do. The thing is: this is the future.” For Aaron and his family, the risks associated with sharing personal

farming data with a company like Bayer is offset by the ability to participate in the next generation of farming technology and by the financial incentives provided by the company. Given the extreme level of incentives provided by Bayer for participating in this beta program, they also seem confident in their computer's ability to make high-quality decisions. Together with soil sampling, yield monitors, and variable-rate planting and chemical application programs like Fieldview promise to be the future of digital farming.

Talking to farmers about their practices, I was convinced that they believed what they do is driven by the latest in cutting-edge science and technology. The underlying logic of this science, however, is the industrial logic of production and accumulation. The primary goal is always profitability. Using soil samples and yield monitors, farmers can know more details about the land they farm than ever. Computer algorithms and digital farming platforms then use these data to the farmers' advantage while managing the chaos involved in farming. The output of these platforms is interaction with the ground in planting, chemical application, and harvesting that is both massive in scale and extremely precise. In modern agriculture, the logic of production science is imbued in everyday practice. In addition to the day-to-day practices of farming, the logic of production science also filters into common discourse of farmers and the everyday language they use.

### 2.1.3 Production Science View of Ecological Agriculture

When I explained my project to the farmers I interviewed, I always let them know that I would be interviewing farmers across the spectrum of practice, from large industrial farms to small-scale and organic growers. Because ecological agriculture is partly built on a critique of



industrial agriculture, I expected the farmers practicing under a largely ecological logic to define themselves in large part in opposition to industrial farming. When I talked to industrial farmers, however, what I found is that they too used ecological farming and organic farming in particular as a type of foil *against* which to define themselves. In many cases, farmers argued that the science was definitively on their side, and as such, the “other side” was anti-science. This was true for both ecological and industrial agriculture. For industrial farmers, confronting the scientific arguments of ecological agriculture often took the form of attempting to encompass impact science within the framework of production science logic. In the cases of the safety of agrichemicals and GMOs, the ability of organic agriculture to feed the world, and propositions for alternative energy using agricultural resources, farmers relied on science communicated by trusted individuals in order to demonstrate the futility of their detractors.

### *Health & Safety of Agrichemicals and GMOs*

One of the most contentious topics I discussed with farmers was the safety of GMOs and agrichemicals. In the early part of data collection, Bayer had recently lost a multi-million-dollar lawsuit to a groundskeeper named DeWayne Johnson in California, who argued that Roundup caused his non-Hodgkins lymphoma. In the course of this project, Bayer lost several subsequent lawsuits on the same issue, after the International Agency for Research on Cancer (IARC) designated glyphosate as “probably carcinogenic to humans” (IARC 2015) The IARC finding and the subsequent lawsuits are in contradiction with the EPA’s designation of glyphosate as “not likely to be carcinogenic to humans.” For industrial farmers, several arguments were made in favor of continuing to use glyphosate.

The first argument is a kind of distorted understanding of the concept of regulation. In this version, government regulation is considered overly intrusive. As such, the lack of regulation is understood as proof positive of safety. In this case, the EPA's decision to designate glyphosate as "not likely to be carcinogenic" is understood as a stamp of approval from a regulatory body whose tendency is toward caution. According to Dan, a second-generation farmer of wine grapes and row crops, the overly-cautious nature of the EPA is frustrating, but also legitimizes his stance against the IARC designation:

I've had the EPA tell me I couldn't put drain tile in a field that I've been farming for twenty years because all the sudden they've decided it's a wetland. Those guys will do pretty much anything to limit what we do. And you're telling me I'm supposed to listen to people who are even *more* interested in regulating what I do? No thanks.

Many farmers like Dan are distrustful of government regulation. As an attempt to mitigate the excesses of industry, regulation is built upon the logic of impact science. To the extent that regulation limits the activities of farmers, it is seen as a nuisance—an intrusion by outsiders into the personal dealings of individuals. When approached from this perspective, farmers distrust the science of regulative bodies because it results in the intrusion by the government. The flip side, however, is that when a given practice or product is permitted, the permission is seen as clear demonstration of safety.

The second argument is a general indication about the relative safety of glyphosate and other modern agrichemicals as compared to what previous generations used. According to this

perspective, whether or not glyphosate causes cancer is less of a concern than if it is an *improvement* upon earlier agrichemicals. Here are Aaron's thoughts on the topic:

Look, I'm not gonna drink [glyphosate]. That probably isn't a good idea. But if you look in our barn, there's a picture of my grandpa pouring some chemical into one of our old sprayers. Now there's some skull-and-crossbones shit. I would so much rather be using Roundup than that shit.

From this perspective, any potential carcinogenic effect of Roundup is made meaningless by its relation to the "skull-and-crossbones" of previous generations. The modern farmer as well as the public can consider themselves lucky to have relatively safe chemicals that allow industrial farming to continue. In this line of thinking, the forward progress of scientific discovery inevitably yields safer and better chemicals over time. As a result, Aaron and other farmers find no need to concern themselves with the dangers of glyphosate.

The third argument emphasizes the limited amount of product used when applying glyphosate. On several occasions, farmers I spoke to told stories about when a stranger asked them about the dangers of their pesticide-spraying practices. Mark told me that he has had several individuals approach him in this manner and his response always emphasizes the minimal product they use on the field:

These people come up to me and ask me about all the chemicals we're spraying on the field. I always tell them that almost all of the stuff we're spraying is water. They're usually shocked. "Look at those big tanks on that

sprayer,” they say. “Well yeah,” I says, “those are full of almost all water and maybe a gallon of roundup.” That usually shuts them up pretty good.

Mark’s comments align with Aaron’s in that the discussion becomes about minimizing the perceived risk associated with glyphosate. For Aaron, it is reasonable to use glyphosate because the alternative is a significantly more dangerous chemical. For Mark, the perception of risk is associated with the *amount* of chemical being applied. Given the volume of the tanks used to spray pesticides on an entire field, it seems ludicrous that only a gallon of it could be dangerous. Of course, that gallon of glyphosate is also responsible for eliminating weeds on the entire field. Regardless, Mark and Aaron feel that the risk from glyphosate is minimal.

Mark’s comments also indicate a trend within this topic that other farmers followed. This argument builds on the larger perspective that farmers have of themselves as outsiders. The farmers I spoke to feel that they are knowledgeable about their own practices and do their best to be environmentally-friendly. As a result, they feel that criticism from the public often comes both from a place of ignorance and stereotypes of simple-minded farmers. Paraphrasing from the following quote from Eric, I call this argument the “other people are idiots” argument:

These people come out here and tell us we shouldn’t spray certain stuff or whatever. They must think we’re idiots. I’m spraying Roundup basically in my own backyard where my kids play. You think I’d spray it if it was dangerous?... It’s the other people that are idiots, not farmers, in my opinion.

In this quote, Eric makes a powerful argument against the intrusion of outsiders. After all, if glyphosate *is* in fact carcinogenic, it is Eric and his family that is at most risk. For Eric, these

types of intrusions by outsiders both demonstrates the ignorance of the public when it comes to agricultural practices and smacks of a paternalism that farmers see as common in politically-liberal and environmentally-conscious urban dwellers. While the latter will be explored in greater detail in the politics section, here the importance is the epistemic disconnect between farmers and the non-agricultural public.

Building on much of the scientific discourse and practices discussed in the previous sections, these farmers consider this environmentally-conscious (and likely urban) intervention to be fundamentally un-scientific. Several farmers had particular ire for the California jury in the Roundup settlement. For industrial farmers, the “other people are idiots” argument extends to the jury of this case, which they see as having been swayed by emotions over scientific reasoning. Jennifer, a professional member of a grain marketing group who group up on a farm and continues to work on the farm part-time had the following to say on the issue:

You have to remember that this was a jury of people in California. They weren't ever going to listen to the science that Monsanto [Bayer] was showing them. They heard this guy got cancer, he used Roundup, that must have caused it. But those people don't know anything about farming so why are we letting them decide?

Jennifer emphasized that the case being in California was essential to Bayer losing it. Presumably because of California's reputation for progressive politics, Jennifer assumes that the residents of California are particularly unable to serve as an impartial jury for this case. In Jennifer's understanding, the presumed politically-liberal leanings of the jury delegitimize the

findings. Once again, “other people,” especially those with particularly *othered* identities (in this case, California residency and associated political liberalism) are deemed unfit to meddle in the activities of farmers.

Finally, industrial farmers simply believed they were on the side of science because they believed the science that was communicated to them. Almost every industrial farmer I spoke with about this issue argued that there was only one or a handful of studies that showed glyphosate was dangerous whereas Monsanto had conducted hundreds of tests demonstrating its safety. This information often came through agribusiness representatives, as demonstrated in the following quote from Randy:

I talked to my agronomist about it and the thing he said is that all this [concern about the safety of glyphosate] is based on, like, one study. Meanwhile there are literally hundreds of studies that Monsanto did that showed it's safe. I'm just not going to worry about it.

When it came to the safety of glyphosate, industrial farmers trusted information shared to them through important and trusted networks. Trusted sources of information such as local agronomists, seed salesmen, and fellow farmers told the farmers that I interviewed that glyphosate had been proven safe in “hundreds of studies.” Conversely, information regarding the dangers of glyphosate tended to come from news media and other outlets that farmers found less trustworthy. Furthermore, the trusted sources tended to mount vociferous opposition to those intimating that glyphosate is unsafe, lobbing accusations of political

motivations and ignorance of the technology. Together, these factors combined to ensure that industrial farmers felt strongly about the safety of glyphosate.

In addition to glyphosate, industrial farmers also discussed the debate around GMOs in extended detail. Once again, these farmers considered science to be on the side of the safety and power of genetic modification in the agricultural setting. Farmers considered any caution and fear around GMOs to be anti-scientific. Consider the perspective of Danielle, an early-career, fourth generation farmer who also works a full-time job off of the farm:

People talk about genetic modification like it's a new thing. We've been genetically modifying dogs for generations. It's just that now we can do it really precisely—change this gene and not that one—instead of just hoping that the next generation is going to have the things we want... There are so many tests and the science is so good on GMOs... At this point, the people that are against it are just asking for something to be angry about.

Whereas with pesticides, some industrial farmers recognized some potential dangers of agrichemicals, in the case of GMOs, none of the industrial farmers had any concerns at all. These farmers often place genetic modification within the history of manipulating dog breeds or artificial selection of plant varieties. As such, genetic modification does not represent a break in agricultural technology, but rather a new form of what humans have always been doing. In this way, it is seen as “natural” for humans to engage in genetic modification. By connecting cutting-edge agricultural technology to understandings of ancient-historical practices of animal domestication and the selection of particular plant varieties for specific qualities, farmers place

themselves in a lineage of agricultural practitioners attempting to keep up with the demands of the day.

In fact, when industrial farmers recognize the differences between modern agricultural technology and earlier practices, they often take pride in the connection between the cutting-edge technology they use every day and other technological innovations. As with almost everything in the period after early 2020, the process of data collection for this project was heavily impacted by the COVID-19 pandemic. Every conversation was held against the background of mask mandates, economic shutdowns, and social distancing. Many farmers were critical of the impact of lockdowns on the economic productivity of the country. However, as news about various vaccines started hitting headlines, several farmers recognized connections between agricultural and vaccination technology. In particular, Aaron contrasted the people who he perceived to be opposed to GMOs while eagerly accepting the vaccine:

I'd bet that most of the people who are going to be lining up for this vaccine are the same ones who are saying GMOs are bad. It's the same technology! It's gene editing! If you're going to put the vaccine in your body, there's no reason you should be worried about GMOs.

Here we see a confluence of several of the themes discussed to this point. Aaron notes the benefit of agricultural technology in the development of the COVID-19 vaccines, further contributing to the narrative that farmers support the rest of society. Furthermore, the "other people are idiots" argument also plays out in this context. For Aaron, the technological connection between GMOs and the vaccine creates a contradiction for people who are



opposed to GMOs but are in favor of the vaccine. As a result of this perceived contradiction, Aaron and others position themselves as “with the science.”

Interestingly, Aaron also insisted that he himself would not be getting the vaccine. To him, the risk of “being a guinea pig” for the vaccine was much higher than the possibility of getting the disease. Although there appears to be logical contradiction in the other direction here, it falls beside the point. The point here is not that Aaron is attempting to have a fully logical set of beliefs. In defining himself *in opposition* to those he disagrees with, apparent logical inconsistencies provide justification for his own position. In this case, the safety of the vaccine was not relevant to Aaron’s point about dismissing concerns about the safety of GMOs. By leveraging “other people’s” eagerness for the vaccine, Aaron positions himself as a rational consumer of scientific information in opposition to the clearly hysterical position of “other people.” His own position on accepting the vaccine is seen merely as a likewise rational and informed decision about risks and benefits.

One additional key to understanding farmers is a sense of rugged individualism. As made clear in the quote above from Glen, farmers consider themselves to be paragons of an American work-ethic that will bear much while asking for little in return. Part of what is expected in return, however, is an allowance for the continuation of the ruggedly individualistic identity. That is, because the lifestyle of farming is relatively spartan,<sup>14</sup> part of the “wage” of being an industrial farmer is the pride in its rugged nature. Concerns about the safety of

---

<sup>14</sup> Many of the industrial farmers I spoke with were struggling to make ends meet. This was not true of all, however. Many of the quite large industrial farmers I spoke with appeared to be doing quite well financially. The economics of this situation will be discussed in a subsequent section.

pesticides, environmental pollution, and even a global pandemic are considered an affront to this masculinely rugged identity.

It is a particular affront when the concerns come from particular others. Since concerns about GMOs are understood to come from a population that is presumably also eager to end the pandemic with vaccines, Aaron understands it as part of an “othered” identity. This other is typically urban, highly educated, politically liberal, and out of touch with modern agriculture. The urban nature of this group is particularly galling to a farming population that highly values the space provided by a rural setting. Furthermore, several farmers referred to cities as “human feedlots” in a derogatory comparison to confined animal feeding operations (CAFOs).

### *Criticism of Organic Agriculture*

In addition to the vociferous defense of agrichemicals and GMOs, industrial farmers also had specifically negative things to say about organic agriculture. In fact, whereas many of the industrial farmers supported small-scale farming, they regarded the practice of organic farming with contempt. In the context of a global pandemic that stressed the global food supply chain, many farmers commended non-farmers for starting backyard gardens or supporting local farmers through CSAs and farmer’s markets. Conversely, practitioners of organic agriculture and the standards required of them were considered illogical, unscientific, and even potentially dangerous.

Several industrial farmers were particularly frustrated with the ban on GMOs in the organic standards. Specifically, these farmers argued that the prevention of Bt-modified corn while allowing the application of Bt pesticide represents a fundamentally illogical position of

organic agriculture. Bt corn (and cotton) is one of the earliest genetically modified varieties and includes a gene spliced from the *Bacillus thuringiensis* bacteria that causes the plant to produce a chemical that is toxic to a variety of pests. Whereas the Bt-variety corn produces this toxin itself, organic standards allow farmers to spray *Bacillus thuringiensis* on their crops in order to produce the same effect. Derrick, a young farmer told me he thought this phenomenon was ridiculous:

Why would you want to spray it on there if the plant can just produce it on its own? Is it safe or is it not? If it's fine, putting it in the plant means less spraying, fewer passes in the field, and less diesel fuel burned. Just doesn't make any sense to me.

As discussed in the previous section, industrial farmers see genetic modification as a continuation of the long history of development in agricultural technology and science. As a result, if the ultimate effect is the same, the organic method simply adds more steps. In addition to these steps creating logistical challenges and inefficiencies, Derrick points out that these steps can be actively harmful to the environmental aspirations of organic agriculture. The more times a farmer needs to drive a tractor through a field means more fuel being burned, but more importantly, it compacts the soil. Soil compacted from tractor tires is a poor substrate for growing plants. The tightly-packed dirt is difficult for young plants to put roots into and filters rainwater more slowly than uncompacted soil. Using this logic, Eric told me he has decided against going organic because he'd "rather drive across it once and spray Roundup than have to drive across it four or five times."

In addition to inefficiencies in the process of production, industrial farmers criticize organic for being ultimately inefficient at feeding the world. Danielle said she “support[s] organic agriculture. As long as *they* decide who’s going to starve.” In this line of reasoning, organic is problematic specifically because of its disconnection with the production science logic. For Danielle and other industrial farmers, the noble intentions of customers and producers pushing for organic agriculture are ultimately fated for catastrophe. These farmers ask the question, “If we aren’t using every tool in our arsenal to maximize production, how would we achieve the goal of feeding the world?”

In seeking to feed the world, the only tool that makes sense is the newest science and technology. The goals of these technologies are understood to be improving efficiency and maximizing yield (and, of course, maximizing profit). To choose not to use them is to therefore choose to be *inefficient* and therefore illogical. When I asked Bill, a large-scale industrial dairy farmer about whether he would ever consider transitioning to organic, his response was very direct:

With organic, you’re asking me to be less efficient than I know I could be.

Make *less* milk, make *less* corn, make *less* hay. Why would I want to do that when I know how much I can make using conventional?<sup>15</sup> Why would

---

<sup>15</sup> The term conventional is used in a variety of contexts. Here, Bill is using it to contrast his industrial practices against organic standards. It is also used to refer to non-genetically modified seed varieties, as in, “you can buy GM corn seed or conventional seed.” Critics of industrial agriculture also argue that “conventional” is often used to describe industrial agricultural practices that are, in fact, quite new. These critics argue that this phenomenon is problematic because by calling these relatively new and extractive practices “conventional,” we naturalize them.

farmers, as a group say, “let’s all make less than we know we could?” It just doesn’t make any sense.

Bill’s comment here is particularly interesting in the context of a dairy industry that has been plagued with overproduction. Here, though, Bill is less concerned with the economics of production than he is with the logic of producing. The point, for Bill, is to maximize output while minimizing inputs. Anything less would undermine logic of production science, the system of industrial agriculture, and the goal of feeding the world.

In addition to criticizing the inefficiencies of organic production, industrial farmers thought that organic agriculture exploits the ignorance of consumers. In another manifestation of the “other people are idiots” perspective, producers of organic agriculture are seen as charlatans praying on a poorly-informed public. One dynamic that was seen as particularly distressing was when low-income families spent more money than necessary on organic products. For Jennifer, a vociferous critic of organic agriculture, this struck close to home:

My sister-in-law struggles. Always has a hard time making ends meet. Well, we had everyone over to the house and I asked her to bring a veggie tray. Just something simple. She gets there and I see she brought this fancy, organic tray of veggies. Now I know that thing cost her twice as much as it should have and I also know she’s already having a hard time! I pulled her aside and asked her why she bought organic. She said she wanted us to think she bought healthy organic food for her kids. I told her that was the dumbest

thing I've heard. "Just buy the normal stuff," I said. "It's fine." And that's what really pisses me off.

Here we see what we might think of as the flip-side of Andrew Szasz's "inverted quarantine." For Szasz, purchasing organic food, NIMBYism, and various other practices are examples of the well-to-do seeking to avoid environmental risks at the cost of exposing less fortunate populations to those risks. In the case of organic food, the wealthy consumers are able to pay price premiums to avoid the risks associated with the industrial food system. This may be done either to protect against the health effects of pesticides or to gain the moral and reputational benefits of "environmentally-conscious" consumption. Jennifer flips the inverted quarantine on its head, arguing that the purported benefits of organic agriculture are misleading marketing schemes that prey on the misinformed. Although this may be fine for those consumers able to afford organic products, Jennifer considers it exploitation of lower-income consumers.

The final argument made by industrial farmers in opposition to organic agriculture is a criticism of the quality of organic products. For industrial farmers, cutting-edge agricultural science and technology produce the highest quality of both row crops and produce. This argument was emphasized to a lesser extent in the context of row crops. The most prominent example was when Larry told me a story about when he saw some organic wheat that looked like "the stuff we try to send out of the back of the combine." After the combine separates out the valuable part of the crop, it spreads the "waste" back onto the field. This process returns some organic material to the soil to provide fertility for the following year. To Larry's eyes, the valuable product retained by organic wheat farmers is essentially equivalent to what he would

consider waste in his own. My understanding is that the wheat appeared small and poorly formed relative to what Larry is used to.

Larry and others had much more to say in the context of organic produce. Although industrial farmers are quite familiar with corn, wheat, and soybeans as agricultural products, they are also consumers who shop at the grocery store for food to feed their families. In fact, many were more familiar with organic products in this context, as opposed to the more directly-comparable context of row crops. The understanding was similar, however, in that organic produce was seen to be smaller and less appealing, while also possibly containing insects and other undesirable contents. Again, Larry laid this out in detail:

Larry: Imagine you have two apples here [he holds his hands out as if holding them]. Now this one here is nice and shiny. It's big. It looks juicy and tasty. Now this one over here, it's smaller. It's shaped weird. It's got worms and bugs in it. Which one are you going to pick?

Ethan [After realizing that he did not intend this to be a rhetorical question]: I would probably have to go for the big, nice one.

Larry: Well, I don't see why anyone would choose organic, then. It's just objectively worse.

For Larry, this characterization of organic produce was obvious. To him and other industrial farmers, organic standards force farmers to create a substandard product. From the consumer standpoint, these farmers could not see why anyone would choose a product they considered to be substandard. Here we see why industrial farmers are so quick to balk at

accusations that they are anti-science. From the perspective of industrial farmers, the alternative to using industrial methods is to throw out the scientific and technological advances of modern farming.

### *Climate Change Skepticism*

The final way in which industrial farmers define themselves in opposition to the ecological logic is in the context of climate change. Theoretically, farmers' livelihoods are at a higher risk from climate change than nearly any other profession. In addition, the agricultural sector (livestock production in particular) has come under significant criticism for its contribution to climate change. However, research has discussed three ways in which people reject the science of climate change. First, in "trend skepticism," individuals reject the existence of warming. In this case, individuals are skeptical of the existence of an upward trend in global temperatures. Second, "impact skepticism" describes uncertainty about the harmful nature of climate change. In this perspective, rather than seeing climate change as a cataclysmic event, individuals see it as likely to be neutral or even positive for life on earth. The final type of rejection is "attribution skepticism," in which individuals argue that although there might be an increase in global temperatures, humans are not likely to be the cause. Instead, natural phenomena such as natural variations in weather or increased energy output from the sun are to blame for any increases in temperatures. All three types of skepticism mark major challenges to efforts to mitigate and adapt to climate change.

The least common form of skepticism among my interviewees was trend skepticism. The most prominent example of trend skepticism came from Larry, whom I interviewed on a



particularly cold day in January. Echoing rhetoric from President Trump in 2017, when I asked Larry if he was concerned about climate change, he said, “What? It’s not cold enough out there for you?... No, I’m not too worried about it.” In this example, Larry promoted trend skepticism by pointing to contemporaneous weather patterns to argue against changes in climate.

In some ways, the paucity of examples of trend skepticism and this quote from Larry demonstrate the evolving nature of climate change skepticism. Even in Larry’s case, his use of trend skepticism was less a firm argument against the existence of rising global temperatures and more a half-joking rejection of the question. For Larry and many other industrial farmers, climate change simply does not qualify as a high priority. The climate may be warmer around the globe but in Michigan, it still gets awfully cold in the winter. This finding indicates that perhaps as the science of increasing global temperatures becomes accepted in the population, impact skepticism will become a more common approach.

When I asked farmers about climate change, I often framed it in the context of their work as farmers. Rather than asking if they were concerned about climate change in general, I asked whether they were concerned that it might affect their farms. My intention was to take the issue out of the political sphere and their lives as citizens and put it into the context of their work lives. In this context, however, I found that industrial farmers were largely unconvinced that climate change would affect them negatively. Despite record rainfalls limiting crop yields in the previous (2019) planting season and a hurricane-like storm (a so-called “derecho”) that damaged hundreds of thousands of acres of crops in Iowa during the course of my interviews, industrial farmers remained unconcerned.

As I spoke with Aaron about the ups and downs of farming, he admitted that the previous year (2019) had been “total trash” in terms of yield and productivity due to the immense rain during the time when planting was supposed to occur. When I asked if he had any concern that these types of weather events might be more common as a result of climate change, he was unconvinced both that the rain signified climate change and that it was cause for concern:

Is that rain really because of climate change though, or is it just what happens?... Sometimes we have rainy years, sometimes the weather cooperates. That’s just farming and that’s how it’s always going to be... I just don’t think a couple of degrees is going to make a big difference for us.

In addition to the rainy planting season of 2019, the derecho of 2020 was a major weather event for the farmers. On August 10<sup>th</sup> and 11<sup>th</sup>, 2020, the storm derecho swept through Nebraska, Iowa, Illinois, Indiana, and parts of Wisconsin. With sustained winds of over 70 miles per hour, the storm caused billions of dollars of damage to property and wiped out a large swath of corn and soybean crops in the nation’s most highly-productive region. Although farmers in Michigan were relatively unaffected by the derecho, they were very aware of and sympathetic to those farmers who were impacted by it. Many of the industrial farmers, however, emphasized that despite the magnitude of the storm, the US corn crop would remain largely the same. Jerry, a young farmer who represents the fourth generation of farmers in his family had this to say:

Yeah, that derecho seems pretty rough for the guys<sup>16</sup> down in Iowa... Thing is, even with all that corn down, I don't think the prices are going to move at all. At the end of the day, it's a drop in the bucket.

Both Aaron and Jerry point out that it is difficult to attribute particular weather events directly to climate change. Rather than directly challenging the existence of climate change, this perspective leverages the uncertainty around the direct causes of weather events to question how strong the impact of climate change will be. Thereby, the rains of 2019 and the 2020 derecho are seen not as part of a pattern of increasingly extreme weather, but rather as part of natural cycles and fluctuation. The result of climate change will be "just a couple of degrees," and therefore nothing to be concerned about. Although Jerry did not mention climate change directly in reference to the derecho, the perspective remains that despite one of the worst storms in recent memory, production would remain high, and therefore corn prices would be unaffected.

The third perspective on climate change, also shared commonly by farmers, is attribution skepticism. For industrial farmers, attribution skepticism took two forms. The first was the fairly common perspective that any change in global temperature or climate is not likely to be the result of human activity. In addition to this perspective, however, farmers took particular issue with the link between agricultural activity and climate change. In this variation,

---

<sup>16</sup> Industrial farmers almost universally refer to other farmers as "guys." This may partly be a result of the linguistic tradition in Michigan and other midwestern areas of referring to mixed-gender groups as "you guys" as opposed to "you all" or "y'all" as in parts of the Southeastern United States. Of course, it also reflects both the reality that a majority of farmers are men and a perception of farming as men's work. Finally, the use of male nouns in farming as well as the ubiquity of the term "you guys" is part of a male-centric culture that will be discussed in the section on politics.

farmers found it unlikely that farming would contribute *more* to climate change than other human activities.

The first variation on attribution skepticism followed fairly closely with long-held beliefs among some political conservatives in the United States. In this perspective, individuals often point to volcanic eruptions or variations in solar radiation as more likely to account for global temperatures than greenhouse gas emissions from human activities. In this perspective, the issue at question is whether humanity *really* has the power to influence climate on a global scale. This perspective was shared most poignantly by Mark when I asked him if he was concerned about climate change:

Am I concerned? No. You have to remember that we've only been here for a little while and we know the weather changes all the time. I think we're getting a little big for our britches by saying we can just go around changing the climate when there are so many other factors in the weather.

Once again, Mark makes the connection between variations in weather and the challenges of connecting them to climate change. Furthermore, although Mark and many of the other industrial farmers were confident in the capacity of production science to "feed the world," the consideration of agriculture's impact remains on a human scale. As Dave told me, "that's God-level stuff." Although (and perhaps because) farmers manipulate their immediate environment to a greater extent than almost any other profession, many feel that manipulating the climate itself escapes the capacity of human beings. Therefore, any alterations in climate change are due to other factors.

More directly, farmers feel that any blame for climate change should fall outside of the agricultural realm. Echoing the sentiment of farmers as outsiders, many industrial farmers argued that people driving to work and living in cities should be held accountable for climate change before themselves. Eric, whose farm ends along a large highway felt this way:

Everyday I see thousands of cars driving by—people going to and from work. And people want to say it's farmers causing [climate change]? Well, how many of the people saying that are driving to work? When they stop doing that, we can talk about ag.

A variation on the “other people are idiots” argument, this perspective seeks to limit the extent to which farmers are to blame for climate change. These farmers see themselves as being unfairly singled out—used as a scapegoat by people who live in far-off places and don't understand the lives of farmers. In this variation of attribution skepticism, the existence of climate change (which is implied by this reasoning, but not often admitted directly) is due not necessary to nature, but to other people. The weight of responsibility thus discarded, farmers are free to go about business as usual.

Ultimately, going about business as usual is the result of climate change skepticism. Whereas climate scientists and activists argue that society will need to radically change course to avoid apocalyptic climate scenarios, most farmers just wanted to continue doing their job. Despite dramatic weather events that have disrupted major parts of the American agricultural landscape, industrial farmers I met remained convinced that the production science logic would ultimately prevail.

#### 2.1.4 Summary of Knowledge within the Logic of Industrial Farmers

In the everyday practices and discourse of industrial farmers, we see the logic of production science clearly. In this context, the proximate goal is always to maximize yield while minimizing input costs in order to achieve the ultimate goal of maximizing profit. Using sophisticated data-collection techniques, farmers make the natural environment knowable to the logic of production science. Data from soil sampling and yield monitors give modern industrial farmers an edge in making decisions to maximize the profitability of their farms. Among the crucial decisions that farmers make are what to plant, where to plant it, and with what combination of agricultural chemicals. All of which are also assisted by various decision-making tools in the agribusiness toolbelt.

Although farmers are always concerned about their farms' profitability, they also see their work as a service to the rest of the world. In going about the hard work of being a farmer, with long hours and tight profit margins, industrial farmers see themselves as set apart from both society and nature. While the rest of the world drives past them in air-conditioned vehicles, farmers do the hard work necessary to provide food for everyone else's tables. The rest of the world becomes objectified and monolithic as "other people," whether they live in relatively proximate urban locales or far-distant countries purported to be in need of food assistance from U.S. agriculture. Nature is likewise objectified, considered "ground" or "dirt" with properties only malleable to the extent that it fits in with the logic of production science. In the battle to eke out a living while feeding the world, nature is either an enemy combatant or an inert substrate.

This worldview is also buttressed by direct challenges to the ecological agricultural logic, which is recognized as a competitor that needs to be addressed. By arguing for the obvious safety of agrichemicals and GMOs, industrial farmers place themselves on the side of science. Moreover, by defining themselves as members of a group using cutting-edge science in a drastic battle against nature in order to feed an exploding population, industrial farmers define themselves *against* a group which is clearly illogical and potentially insane for opposing them. The perceived insanity and illogic of the logic of ecological agriculture is made most clear in the case of organic production. Industrial farmers simply do not see a purpose for opting out of using the best technology in order to produce a product they see as inferior for a price they understand to be entirely unreasonable. If farming is ultimately about feeding families, industrial farmers see organic production as either taking food out of the mouths of children or taking money out of the pockets of their parents. Either way, the supposed environmental benefits are not seen as worth it.

When it comes to climate change, the conclusion arrived at by industrial farmers is that it remains of minor concern. Whatever argument they choose to enact in opposition to climate science, the ultimate effect is that industrial agriculture need not drastically change its logic. *If* climate change is happening and *if* it will be significant, it is other people that should be to blame for contributing to it long before farmers should.

The institutional logic of industrial agriculture is undergirded by the epistemic foundations of production science. Likewise, the logic of production science in farming is infused with the goals and worldview of industrial agriculture. Both are challenged in

fundamental ways by the institutional logic of ecological agriculture and its underlying epistemic foundation: impact science.

## 2.2 Knowledge within the Logic of Ecological Agricultural

If the industrial agricultural logic is infused with the epistemology of production science, the epistemic foundation of the ecological agricultural logic is impact science. Whereas the former emphasizes maximum production of agricultural products and profits, the latter attempts to recognize the environmental and social repercussions of farming. With impact science as a foundation, practitioners of ecological agriculture build a practice and discourse from a critique of industrial farming. As such, ecological agriculture is built on a knowledge system that is fundamentally oppositional, if not always radically so. In building this oppositional practice and discourse, ecological farmers often look to pre-industrial practices as models.

In this section, I will lay out the practices and discourse associated with the logic of ecological agriculture and the epistemology of impact science. In particular, I focus on the ways in which ecological farmers understand their practice to be fundamentally scientific and talk about it as such. I also demonstrate the ways in which ecological farmers define themselves *in opposition* to industrial farming, considering the latter to be fundamentally at odds with science. I will conclude this section by drawing connections between the various issues discussed in this section.

### 2.2.1 Impact Science in the Discourse of Ecological Farmers

One aspect that quickly becomes clear when you go from talking to industrial farmers to talking to ecological farmers is the difference in discourse. Although almost all of the farmers I spoke



with share a distinctive Michigan accent and common midwestern colloquialisms, ecological farmers simply talk about farming and the world in a much different way than industrial farmers. Referring to land or soil, as opposed to dirt or ground, ecological farmers emphasize the earth itself as a living ecosystem. Within that ecosystem, ecological farmers spoke specifically about valuing an intimate knowledge of their place. That is, ecological farmers wanted to have an intimate knowledge of the land that they farmed and their own role in the natural processes taking place within it. In order to do so effectively, many drew on traditions of indigenous knowledge and history in order to place themselves within a lineage of people seeking to live in communion with nature.

### *The Soil as a Living Ecosystem*

As discussed in the section on industrial agriculture, farmers operating under production science often think of the earth as a substrate, referring to it as “dirt” or “ground.” Among ecological farmers, the earth was referred to universally as “soil” or “land.” Whereas the latter refers to sections of earth, often understood to have a particular character or personality, the former refers to that part of the earth with which the farmer interfaces directly. Both are understood to exist within an ecosystem of organisms both large and small, all of whom (including the farmer) need to work together to achieve their goals.

When discussing land, ecological farmers often mentioned how fortunate they considered themselves to be able to inhabit the particular piece of land they farmed. When I asked Jessica, a member of a small, ecologically-focused produce and livestock farming

operation in southeast Michigan, about how her operation came to their farm, she had this to say:

We are super fortunate to be on this land... It was available when... [we were looking for] land and we were able to lease some of it with the understanding that we would eventually buy it. A few years ago, we were able to purchase it with what we've made from farming and it's just been a total blessing... [This land] has really treated us well.

Jessica's emphasis on the "fortunate" nature of the availability of the land she now farms as well as her description of it as a "total blessing" demonstrates her appreciation for it. Along with many other ecological farmers, Jessica considered her access to the land necessary for growing food as a fundamental part of her work as an ecological farmer. Particularly in southeastern Michigan, where urban sprawl from cities such as Detroit and Ann Arbor have increased the price of property, farmers can have a difficult time finding access to land. In the case of Jessica and her partners, ownership of property came after renting it. With such difficulties, ecological farmers were particularly thankful for any land they had to farm.

In addition, the land often becomes personified, as when Jessica says the land "treated us well." Ecological farmers think of themselves as a member of a community which includes the land and the organisms within it. By personifying the land and understanding it as an actor, ecological farmers come to see the behavior of the land as a response to their own behavior. Cara, an organic flower and produce farmer who also raises chickens in central Michigan understood her farming practice as half of a reciprocal relationship with the land:

When you farm this way, the land rewards you. When you treat it well, give it what it needs, understand that it is a living... entity, it will give you what you need. You have to be in relationship with the land. It's the only way to do it if you're going to [farm with organic practices].

This reciprocal relationship between the farmer and the land is central to the discourse of ecological farmers. In contrast to industrial farmers, who considered the "ground" as a substrate upon which to apply necessary chemical additives in order to maximize production, ecological farmers thought of the land as a personality that needs to be nurtured in order to achieve their goals.

In order to best nurture the land, ecological farmers focus on the health of the soil. Once again, the emphasis is on the living nature of the soil, its personality and characteristics, as well as its ability to act to either help or hinder the goals of the farmer. Using the various methods of ecological agriculture, farmers attempt to nurture the organisms within the soil. Here, Jeff, a member of an organic produce farm in southwest Michigan talks about the importance of soil health:

It's all about what's going on in the soil. Are those worms and fungi and bugs happy?... If they aren't, you're not going to be happy. You have to feed the soil for it to feed you... I may say that I grow squash or lettuce or cucumbers, but at the end of the day, the most important thing I grow are those things in the soil.

As Jeff demonstrates, many ecological farmers consider the interaction with the soil the basis upon which the rest of their farming operation is built. In fact, some even said that they “farmed the soil” to emphasize that the crops or livestock that constitute the ultimate products of the farm are but a byproduct of the farmer’s interaction with the soil. Here, ecological farmers share the industrial farmers’ goal of producing products to sell. As I will discuss in future sections, financial sustainability is an essential part of any ecological farming operation. However, ecological farmers perceived the health of the soil to be inextricably linked with the heft of their wallets.

In addition, ecological farmers consider their practices to be part of a larger ecosystem which extends below as well as above the soil. In addition to the “worms, fungi, and bugs” that Jeff mentioned in the previous quote, many ecological farmers mentioned that they also thought of their land as including the birds, insects, and other animals that many industrial farmers consider pests. Amy, an urban farmer in the Detroit area who grows produce with a focus on sustainability and regenerative agriculture, argued that animals that are often considered pests are essential to her operation:

A lot of people [who farm] hate rabbits. A lot of birds can be really destructive. The thing is, though, you have to find ways to live with them. I can’t go around shooting rabbits, especially in the city, so I have to find ways to keep them away from the [important crops]. The birds are going to eat a lot of the bugs that I don’t want around, so I need those. You’ve got to work with what you have, give nature what she needs, and find a balance.

In this way, the land and soil extend beyond the surface of the earth to include both the micro- and macro-organisms below the soil as well as the animals above the soil and in the sky. All of these make up a community in which the farmer positions themselves. By nurturing the soil and the land, the ecological farmer plays the role of a good community member, thus worthy of being rewarded by the community with abundant food of high quality.

All of this contrasts strongly with the perspective of industrial farmers discussed in the previous section. Rather than the substrate understanding of dirt and ground, ecological farmers think of soil and land as personified actors within their farming operations. Whereas industrial farmers seek to gather data about their farm ground in order to calculate the additives necessary to make the dirt profitable, ecological farmers seek to work in collaborative community of human and beyond-human actors. In order to work collaboratively in this way, however, ecological farmers recognize the importance of having an intimate knowledge of the land and their place within it.

### *Intimacy of Knowledge in a Specific Place*

One of the reasons that ecological farmers personify the land they farm is because they value the benefits of intimately knowing a particular place. After farming a particular corner of the world for a long period of time, ecological farmers come to know the nuances associated with each piece of it. Whether growing produce or livestock, ecological farmers strive to know their land intimately. In doing so, they also seek to maximize the productivity of high-quality areas while building up the qualities of areas that need improvement. In order to achieve this

knowledge, ecological farmers must also come to understand their own place within the ecosystems they inhabit.

In order to intimately know a place, ecological farmers often prioritize densely-packed farms over expansive ones. Whereas industrial farmers often work with thousands or tens of thousands of acres, most of the ecological farmers rarely farm more than a few hundred acres. In fact, many of the farms I visited were less than ten acres of densely-packed produce. In part, this reflects a value for what ecological farming icon Wendell Berry refers to as a high “eyes-to-acre ratio.” Whereas industrial farming often seeks to farm as much acreage as possible with the fewest number of people, the logic of ecological agriculture argues that with fewer eyes, the land cannot be known as intimately.

This intimate knowledge of dense areas is essential for making the right decisions at the right time. Like their industrial counterparts, ecological farmers operate on tight margins. Planting crops, moving livestock, or harvesting products one day as opposed to the next can mean the difference between a profitable year and an unprofitable one. Paul, a young farmer operating a grass-fed beef operation in southeastern Michigan, felt strongly that his herd of 170 cattle was about the limit of what he wanted to do.

I might add maybe a dozen or so more but that would really be pushing it.

With this many, each pasture’s ready when I need to move [the herd] there.

Like this one we’re on—it’s really sandy and kind of rocky so I don’t like to put them on it as much as say, that one down there [he points down a hill toward

a different pasture]. That one's usually ready more quickly so I can move them to it without worrying about them overgrazing.

By knowing the qualities of the different pastures he farms and how the cattle he runs on them will affect it, Paul knows how to best utilize the resources at his disposal. From Paul's perspective, adding more cattle might increase his bottom line, but upset the delicate balance constituting the ecosystem of his farm.

Whereas Paul's operation was relatively expansive for an ecological farming operation, many were much smaller. Still, the farmers who operated farms of less than ten acres could often see significant differences between adjacent beds, or even adjacent rows within beds. When I visited Cara, she showed me differences between rows of flowers based on their proximity to one another.

I try to plant my vegetables in with my flowers because it all helps with pollination... See this row of marigolds are next to this row of garlic. See how they're taller than those marigolds over there? There's nothing different between the two, other than this one is next to the garlic.

To be honest, I had a hard time telling the difference between the two rows of marigolds. But with Cara's sharp eye and experience, she could see a major difference. I have no doubt that her eyes are better than my own.

Whereas Cara noted the difference between rows of the same plant based on what they were planted next to, Jessica pointed out a corner of one bed that she felt was affected by the shade from a nearby tree:

That corner down there gets shade from that big maple tree there during the afternoon. It's crazy because the cucumbers we planted down there last year were, like, two-thirds the size of the cucumbers in the rest of the bed. This year, we decided to plant some chives in that corner because they're shade-loving... They've been doing pretty well.

Keep in mind that the corner that Jessica was indicating could not have been more than a ten-by-ten square feet out of a bed that was at least ten times that size. With the careful attention of individual farmers who interact directly with the beds on a daily basis, however, these types of differences are quickly noted and addressed, if possible.

Importantly, addressing such issues was understood as very much part of the process of intimately knowing a piece of land. As we saw in the section on industrial farming, particular ground is understood to have qualities that are adjustable only to the extent that you can do so with industrial chemicals. Conversely, ecological farmers understand their practice as at least potentially regenerative, seeking to fundamentally alter the soil for the better over time.

Although there are many buzzwords in modern agriculture, one that describes this approach is "regenerative farming." Regenerative seeks to go beyond sustainable by attempting to improve the quality of the land. The specific techniques for this will be discussed in more detail in the practices section, but two main techniques are planting cover crops and using rotational grazing methods. While the latter is somewhat controversial due to links between livestock and greenhouse gases, many ecological farmers feel that good livestock management practices are essential to solving environmental problems. Karen, who grows



organic beef in south-central Michigan argues that cattle are essential to regenerative agriculture.

When we got here, this [farm] was a mess. The people who had it before just didn't really do anything with it. There were gullies, there was only a couple inches of topsoil, it just wasn't great... Now we've started doing the rotational grazing and we have a guy come and test every year—we've added six inches of topsoil in ten years... We need farming to fix these environmental issues.

You just have to do it right.

From this perspective, regenerative agriculture can be a solution to environmental problems rather than a driver of it. For these farmers, the logic of rotational grazing comes from popular ecological farmers such as Joel Salatin and Greg Judy. Salatin is known for educational farming books including *Salad Bar Beef* as well as more explicitly political and critical books such as *Folks, This Ain't Normal*. Likewise, Judy has produced hundreds of YouTube videos demonstrating various techniques he uses in his pasture-based cattle system. Both use insights from pioneering rotational grazing expert Allan Savory. The names Salatin, Judy, and Savory are often referenced among ecological farmers. This is particularly true for those who raise livestock, such as Paul.

So much of what I know comes from Joel Salatin's books and I watch pretty much every one of Greg Judy's videos. After reading those books and watching some videos, I became pretty convinced that we could make this property better than it ever has been, rather than always making it worse.

Armed with this canon of highly-respected ecological farmers, ecological farmers felt confident that they could improve their land. By using techniques developed by these trusted sources and working *with* nature and their animals, these ecological farmers were convinced they could be regenerative in their farming practices. Again, ecological farmers consider themselves part of a community, which they seek to build up in order to achieve their own agricultural goals.

The final aspect of intimate knowledge for ecological farmers is knowing one's own place within the ecological system. Ecological farmers emphasized the careful balance between working with nature and being over-run by nature's power. The goal for ecological farmers is to use natural systems to their advantage. Indeed, the rotational grazing strategies of Alan Savory and others, as well as many other ecological farming techniques, actually seek to mimic natural systems in order to better mesh with the more-than-human community. When I talked to Jake, who runs a sustainable homestead that emphasizes community engagement, he put it this way:

Man can't be in conflict with nature, at least not for long. We've done a lot of damage to the earth by trying to beat it into submission, you know? Man has a lot of power to affect the earth, but if we want to stick around for very much longer, we have to figure out how we can use that power *with* the earth, not against her.

Jake emphasizes two important aspects of this issue in this quote. The first is humanity's power to destroy. Using the logic of impact science, Jake argues that by working in conflict with nature, humanity is now reaping the consequences of environmental destruction. In contrast, he also emphasizes humanity's capacity to work with nature. Though he uses language that

many feminist scholars may take issue with, Paul's position here mirrors many within the logic of ecological agriculture: given humanity's power of destruction, we *must* find a way to exist collaboratively with nature.

In order to work collaboratively with nature, ecological farmers must know the specific place where they reside. For farmers, the particularities of farming in Michigan makes their work unique. In particular, many farmers brought up the benefits of being situated between two of the Great Lakes. For those farming in southwestern Michigan, like Michael, a third-generation organic fruit grower, proximity to the lake is central:

Being this close to the lake is a blessing. We get plenty of rain, but with the sandy soils, we don't usually get too much... The water moderates the colder temperatures in the fall and winter... [I can] grow grapes and peaches and apples that would otherwise be tough up here.

In addition to the particular natural amenities and difficulties associated with growing food in Michigan, ecological farmers often emphasize the importance of being familiar with native species. In doing so, ecological farmers position themselves within a longer ecological history of the place in which they operate. Christopher, an ecologically-minded farmer in southeastern Michigan emphasized the importance of native species.

You know this whole area used to be an oak and maple forest. That's something you need to know if you're going to do this kind of thing... After looking around and recognizing the ecological history of this place, I realized that planting oak trees to make acorn flour would be...the right thing to do.

For both Christopher and Michael, the logic of ecological agriculture prioritizes the long history of the natural environment for determining what to grow. Certain locations, such as those along the lakeshore of Lake Michigan, benefit from the particular geographies they exist within. These benefits are circumscribed for ecological farmers, however. From the perspective of ecological agriculture, the environment and the farmer are best served by farming those items best-suited for the landscape. In seeking to understand humanity's place within the natural system, ecological farmers find that they must intimately understand both their immediate surroundings as well as larger ecological and historical systems.

### *Drawing on Pre-Industrial Knowledge*

An essential part of the epistemic foundation of ecological agriculture is pre-industrial knowledge and technology. In rejecting the production science perspective of industrial agriculture, ecological farmers look to incorporate knowledge from before the industrial revolution. This phenomenon is partly a rejection of the perceived supremacy of modern technology and knowledge and partly a nostalgia for knowledge that feels out of the norm. Although this respect for pre-industrial knowledge often highlights indigenous knowledges, it also often centers on knowledge from pre-industrial Europe. Once more, ecological farmers place themselves in the longer history of agricultural practice in this way by tying themselves to earlier forms of agricultural technology. In this section, I draw on quotes from a variety of ecological farmers to demonstrate the connection they feel with particular pre-industrial technologies including the grain mill and the scythe, as well as the reverence they feel for indigenous forms of knowledge.

When I asked potential interviewees if they would be interested in talking with me, I often explained that I was interested in the science and technology they used on their farm. Many of the ecological farmers said they “didn’t use technology” on their farms, associating the concept with cutting-edge digital devices and gadgets. I would often respond by saying that I was also interested in their “non-use” of technology, with the intention of exploring the ways in which they rejected the concept of technological advancement while using devices and processes they did not consider “technology.” I explained this broader conceptualization of technology to Justin, who runs an organic farm and flour mill with his wife Nicole, and he quickly expanded on it:

We use all sorts of technology, then. We have the modern stuff, you know, we use Facebook and all that stuff, but we also have technology that was really improved by Franciscan monks in the Middle Ages and not really changed an awful lot from that point...We are currently running a thirty-inch grain mill with 800-pound North Carolina granite stones in it.

Here, Justin recognizes the similarities and differences between modern and pre-industrial technologies. He also demonstrates a knowledge of the history of the technology he uses and a reverence for those who invented it. Using “Middle Age” technology in conjunction with modern devices such as Facebook, Justin and Nicole position themselves in a longer history of agricultural technology and knowledge that also values the present.

This appreciation for things both old and new came in many variations among ecological farmers. In Justin’s case, using modern technology alongside pre-industrial made perfect sense,

particularly given the effectiveness of the grain mill he uses for making flour relative to the effectiveness of social media for connecting with potential customers. Conversely, some ecological farmers specifically argued for the superiority of pre-industrial technologies over their modern equivalents. In particular, Jake argued that a scythe was far superior to modern weed-whackers<sup>17</sup> in a variety of ways:

The thing is, I'd rather use the scythe over the weed whacker. First of all, I can cover more ground more quickly with a scythe than I could with a weed-whacker... They've done some tests that have shown that pretty convincingly and that seems to be true in my experience... Also, it's quieter, it's less dangerous, you're not burning up plastic strings all the time, and the only fuel you're burning is through your own bod. It's great!

This full-throated defense of the superiority of the scythe over modern technology is based on several factors. Although Justin's secondary reasons include an implied value for environmental considerations, his primary reason for valuing the scythe is efficiency. Here, the logics of impact science and production science are compatible in the sense that this particular technology maximizes the goals of each.

The reverence for pre-industrial technologies demonstrated by Justin and Jake highlights the expansive view of technology held by proponents of ecological agriculture. Whereas industrial farmers often seek to use the newest and most cutting-edge science and technology, ecological farmers value more traditional agricultural technology and knowledge.

---

<sup>17</sup> Also referred to as "weed-whips" or "weed-eaters" in discussions with different interviewees.

Although this is often built from a critique of industrial agriculture that is inherent in the logic of impact science, ecological farmers also highlight the effectiveness of these technologies for their goals. In addition to being in a more-harmonious relationship with the natural environment, ecological farmers position themselves as effective users of traditional agricultural technology.

Whereas the scythe and the stone grain mill are often recognized as part of the European agricultural tradition, many ecological farmers also valued the agricultural traditions of indigenous peoples. In this way, ecological farmers position impact science within a larger critique of industrial agriculture as the work of colonization. The logic of impact science, therefore, is built upon a critique of both the ecological impact of industrial agriculture as well as the associated social exploitation of indigenous populations. In seeking to overcome these impacts, ecological farmers draw on the knowledge, technology, and historical legacy of indigenous agriculture.

The most common example of this phenomenon among ecological farmers is the “three sisters” technique of planting corn with squash and beans. By planting these crops together, the three “sisters” each help one another to grow. This technique is often mentioned in connection with the Thanksgiving myth of the Pilgrims who were supposedly taught to use this technique by the surrounding indigenous communities. Luke, an organic produce farmer on the west side of Michigan, pointed to this as an instance of social and ecological collaboration:

It’s like the three sisters, right?... The natives taught us that so we could survive here. They helped us out by showing how the corn is helped by the

squash and the beans... It's a great model for how we can all live together and how we should think about farming as part of a community.

Here, Luke draws parallels between the collaborative efforts of indigenous communities and early American colonizers to make a larger case for collaboration and community in farming. If plants can help one another, people can also help one another, according to Luke. This mirroring of the collaborative and mutually-reinforcing processes of natural systems and human communities is a common refrain among ecological farmers. In this understanding, a more community-centered and collaborative method of farming can serve as a model for a more kind and nurturing society.

Of course, the perspective shared by Luke elides the exploitation and extermination of indigenous populations perpetrated by subsequent waves of colonizers. Furthermore, by using language such as "us" and "they," Luke reinforces a perspective of indigenous communities as the other, even while appreciating their knowledge. Other ecological farmers presented a more radical view of indigenous knowledge as fundamentally at odds with the status quo. One way this was presented was when ecological farmers would share a variation on the Indigenous Land Acknowledgements that have become increasingly common among activists and scholars. Christopher brought this topic up when discussing the ecological history of the area:

Well, you also have to recognize that white people took this land by force, you know? It isn't really ours. I believe the land here was once occupied by the Potawatomi... Before we can really reconcile with the land, we need to reconcile what we did to the people who were on the land.



In this way, Christopher recognizes the history of exploitation that allows him to use the land he farms. Furthermore, he ties the “reconciliation” of the damage wrought by humanity upon the land to the reconciliation of the damages colonizers wrought upon indigenous populations.

Other ecological farmers go one step further to argue for the inclusion of indigenous epistemology within contemporary agricultural practice. For farmers who share this perspective, the marginalization of indigenous knowledge is central to the colonial project upon which industrial agriculture is built. Here, Amy describes her perspective on these issues:

When we, ya know, committed genocide on the indigenous population, we lost a lot of the knowledge those people had from living here for generations. That leaves us with basically what Monsanto or the USDA or [Michigan State University] tells us. There are lots of people working on trying to get some of that knowledge back.

By evoking the term “genocide,” which she used cautiously but intentionally, Amy draws a direct connection between industrial agriculture and what many have called America’s “Original Sin.” To Amy, the flawed nature of the system of industrial agriculture results, at least in part, from its foundation in the killing and removal of the native population from the land and the ensuing delegitimization of indigenous knowledge. For these ecological farmers, the dominance of production science and industrial agriculture blinds farmers to alternative ways of knowing. They believe this fundamentally broken and unjust aspect of the agricultural system must be reconciled in order to make progress toward any concept of sustainability.

In this section, the assumptions of ecological farmers were demonstrated through the way they spoke about what they do. In the ways that farmers talk about the soil from which they grow food to feed themselves and their communities, ecological farmers reveal a reverence for the natural and living systems within which they are embedded. This embeddedness is highly valued, both for farmers to become intimately knowledgeable of the world around them, and so they might be able to find an appropriate place for them to situate their own practices. In seeking models for a more harmonious interaction with the natural world, ecological farmers refer to pre-industrial technology and knowledges. Partly as a nostalgia for traditional technologies, and partly as a direct rebuke of modern science, ecological farmers reject the common technique within industrial agriculture of striving to be on the cutting-edge of science and technological application. By drawing upon and displaying a respect for indigenous knowledge, these farmers also recognize the ecological and social history of a country they perceive to have flaws. In order to be effective farmers, however, my participants also emphasized the importance of turning these topics of discussion into practices in the real world.

### 2.2.2 Impact Science in Practice with Michigan Farmers

Like industrial farmers, ecological farmers often emphasized a value for action over talk.

Farming is a profession which requires hard work when necessary, good decisions at opportune moments, and the wisdom to know when to make decisions and when to simply get to work. In order to make the best decisions, however, ecological farmers also depend upon the impact science which underlies both their critique of industrial agriculture and forms the base of their

own practice. In this section, I will discuss the ways in which ecological farmers turn impact science into the practice of farming within the institution of ecological agriculture.

Practices among ecological farmers varies significantly. Whereas some ecological farmers practice a version of organic agriculture very akin to industrial agriculture, but with organic inputs substituted for the industrial ones, others practice a more radical alternative to the industrial model. This section will begin with the more industrial end of the ecological agriculture spectrum, with practices such as no-till and rotational cover crops, which have become fairly commonplace among industrial farms. Using these techniques, large technology companies such as Microsoft and others have argued that farmers may contribute to carbon sequestration and the development of so-called “regenerative agriculture.” The section will dive increasingly deeper into more radical forms of ecological agriculture, including practices such as agroecology and polyculture, using a mixture of plants and animals within a single system. I will conclude with a discussion of the connections between the discourse mentioned above and the practices listed in this section before moving on to the view of industrial agriculture from the perspective of impact science.

### *Mainstream Ecological Agriculture*

Criticisms of the industrial agricultural system have gone fairly mainstream in recent years. An increasingly large portion of the population has reduced its meat consumption due to the perceived environmental and health harms of animal agriculture.<sup>18</sup> Much of this change has

---

<sup>18</sup> According to a Gallup poll, although the percentage of the US population that identified as vegetarian has remained steady at about 5% for two decades, in 2020, 23% of the U.S. population reported a decrease in meat consumption.

been spurred by popular documentaries including *Cowspiracy*, *Kiss the Ground*, and *Food, Inc.* In particular, *Kiss the Ground* criticizes industrial practices of intensive tillage and heavy chemical use. Among the suggested solutions to these issues are the practices of no-till and rotating cover crops. These solutions are purported to have the capacity to sequester carbon in the ground, contributing to regenerative agricultural practices that farmers may get remuneration for through carbon markets.

No-till practices are fairly easy to understand. Whereas typical industrial farming practice involves plowing farm fields repeatedly in both the fall and early spring, no-till seeks to disturb the soil as little as possible. Theoretically, benefits abound from no-till farming. By leaving the topsoil in place, ecological farmers encourage the growth of the living systems within the soil. Rather than being turned over and chopped up, organisms within the soil can feed on crops from previous years, building a layer of organic matter that can be used by subsequent crops. Furthermore, new crops can benefit from the structures left in the soil by the root systems of previous years' crops. Finally, by avoiding tillage, farmers save their field from an additional pass of heavy equipment, which can compact deep layers of soil. The downsides of no-till farming (according to industrial farmers) are that it makes it difficult to fight weeds and limits the ease of planting in the spring, both because the stubble from previous years can be difficult to plant into and an unplowed field can take longer to warm up in the spring thaw.

The farmers I talked to who practice no-till, however, were convinced of its benefits for their farms. Largely, they were convinced that the benefit of increased organic matter in the soil outweighed any downsides associated with weeds or planting difficulties. Jeff, whose

organic farm grows mostly produce, has begun to work on implementing a no-till system for row crops. For him, no-till was the only way to go:

The row crops we're working on are going to be no-till. It's the only option for us, really. We want to leave all those nutrients right where they are. Why would I want to plow them up?

Particularly for an organic farm like Jeff's, no-till makes a lot of sense. Without powerful chemical fertilizers, Jeff needs to keep nutrients and organic matter in the soil as much as possible. Even for farmers who operate under a more industrial logic, reduced tillage has become a major goal.

One problem for achieving the goal of reducing tillage is the inter-generational fight within farming families. For example, when I asked Mark, a relatively large-scale industrial row crop farmer, if he would be interested in adopting no-till practices, he had this to say:

You know, Ethan, that has been quite a fight. I've been telling Dad for years that we should just try it out, you know? Everyone seems to be pretty excited about it, so why don't we just try it? Thing is, Grandpa absolutely *loves* his molboard plow... I think he'd use it everyday if he could, so it's been a challenge to implement something like no-till.

Whereas Mark is interested in testing out the benefits of no-till farming, he faces a challenge mentioned often by young farmers: older generations are often uninterested in changing practices. Molboard plows, which dig deep into the soil and flip over a layer using curved plow blades are essentially the antithesis of no-till farming. If no-till seeks to disturb the soil as little

as possible to maximize organic material, the goal of a moldboard plow is maximum disruption. Being the youngest farmer in the family, Mark's wishes were ultimately overruled by older generations, despite (and perhaps due to) his eagerness to engage in practices more in-line with the logic of ecological agriculture.

In a similar vein, cover crops have gained recent attention for their ability to incorporate parts of an ecological agriculture logic within fairly mainstream industrial practices. In the case of cover crops, the goal is to "always have a living root in the ground." Whereas industrial farming operations will often leave a field fallow (nothing growing in it) between the harvest in the fall and the subsequent planting in the spring, cover cropping involves the planting of a crop immediately after harvest. The crop will therefore have time to grow before cold winter weather (at least in Michigan) prevents further growth until the spring. Doing so allows the cover crop to start building a root system, preventing erosion in the winter and early spring. In addition, this practice articulates well with no-till, as utilizing cover crops and a no-till system maximizes soil organic matter. Finally, although some cover crops are not intended to be harvested and are instead terminated before planting season, others can be harvested and sold for a profit. Although some industrial farmers were skeptical of the benefits of cover crops and were particularly uncertain about the return-on-investment of planting a crop that is not intended for sale, the farmers who used cover crops were enthusiastic about their benefits.

In particular, ecological farmers who used cover crops were excited about the benefits for cover crops to contribute to the growth of cash crops. For farmers raising perennial fruit crops, such as apples, grapes, or hops, planting cover crops was understood to contribute to both the quality of growth as well as the taste of the final product. Marcus, a second-generation

farmer operating an organic apple orchard was convinced that planting cover crops between rows of apple trees benefitted the apples.

A couple years ago, I convinced my dad to start planting a mix of clover and alfalfa between the rows [of apple trees]. I'd been reading in magazines and forums and stuff that it... helps. I think it's been pretty beneficial.

Likewise, when I talked to Adam, who grows hops on the east side of the state, he was convinced that planting cover crops between rows of hops had contributed both to the health of the plants as well as to the flavor:

I think the cereal rye [that we planted between rows of hops] has been really beneficial. I haven't done the math per se but it certainly feels like the hops have been better since we started doing that... I've also heard... with grapes, if you plant lavender in between the rows, the grapes can taste like lavender a little bit. Well, I like to think that putting the rye in between our rows gives us a little of that, too.

Adam finds that by planting cereal rye between his rows of hops, he can affect the taste of his hops in the ways that grape growers do with wine grapes. In the wine world, and increasingly in the world of hops, this effect is known as *terroir*, or the characteristic taste of a given wine based on the environment in which the grape is grown. Once again, the specific location and surrounding environment of the crop is given particular attention. In this perspective of agriculture, in addition to the farmer needing to know the intricacies of a particular location in order to farm effectively, the particular characteristic of the environment is *imprinted* upon the

product itself. In this case, Adam finds that he might have some effect on terroir through the planting of cover crops, which also provide the added benefit of feeding nutrients into the ground for the hops to take in.

Like no-till, cover crops have found a fairly firm foothold among farmers who typically farm within the logic of industrial agriculture. In fact, particular types of wheat, one of the major cash crops in the United States, can be used as a cover crop. After harvesting corn or beans in the fall, industrial farmers often plant winter wheat, which needs the cold of the winter in order to fully mature. However, whereas other types of cover crops are terminated in the early spring, winter wheat isn't harvested until late summer, meaning farmers are unable to plant a subsequent cash crop after harvesting wheat.

Two of the mainly industrial farmers I interviewed have experimented with cover crops to mostly positive effect. Eric found cover crops to be particularly effective to combat wind erosion in his fields:

It gets pretty windy through here so I've seen us lose a good amount of dirt.

We started planting a couple of different cover crops a few years ago—mostly rye... It's really helped us keep that dirt in place.

Especially for farms like Eric's that have little protection from the wind, utilizing a cover crop can help significantly with erosion problems. In addition, Eric told me that he had even sold a crop of rye to a distiller once, though he ended up terminating it with chemicals in the other years in order to plant corn or soybeans. Here, Eric demonstrates a mixture of industrial and ecological logics. When compatible, techniques used by ecological farmers can be picked up by



industrial farmers, particularly if it benefits the ultimate goals of maximizing profit and production.

Cover crops and no-till have been particularly noted as methods by which farmers might contribute to combatting climate change. Indeed, early in President Biden's term, he made a point of making combatting climate change a major goal for USDA Secretary Tom Vilsack. By reducing tillage, advocates for this method argue that carbon that is stored in the soil will stay in the soil, as a significant amount of carbon emissions from agriculture come directly from plowing farm fields. Furthermore, by utilizing cover crops in addition to cash crops, Vilsack and others have argued that farmers have ability to draw carbon out of the air and store it in the ground as organic material.

In order to encourage such practices, several companies have sought to develop carbon markets, through which farmers will be paid for sequestering carbon through these practices. Companies including Indigo Ag and Nori have built systems for measuring beneficial agricultural behavior as well as increases in soil organic material in order to pay farmers through carbon credits. This way, other companies can offset their carbon emissions to meet either legislated cap-and-trade limits or internal commitments regarding carbon neutrality. As more companies commit to such goals, the market for carbon sequestration has likewise grown.

Critics argue that carbon markets defeat the purpose of sustainability by encouraging companies to merely pay to continue polluting the atmosphere. From this perspective, the ton of carbon emitted by a manufacturing company is simply not equivalent to a ton of carbon theoretically sequestered by good farm management. Furthermore, this system of carbon

markets rewards farmers for *changing* behavior, leaving those farmers who have long been practicing such stewardship practices out in the cold. These discussions remain in nascent stages, however, and none of the farmers felt strongly about the ability for agricultural carbon markets to work.

In addition to these issues, practitioners of ecological agriculture also argue that using carbon markets is an overly simplistic vision of sustainable change in agriculture. For those farmers proposing a more radical alternative to the industrial model, carbon markets through no-till and cover crops are the tip of the iceberg of necessary changes in the agricultural system. In this more radical vision of ecological agriculture, farmers prioritize concepts such as agroecology, polyculture, and integrated crop and livestock systems.

The technologies necessary to implement carbon markets to pay farmers for using no-till and cover crop methods are an extension of the digital farming platforms discussed in the section on industrial farming technologies. In order to track carbon sequestration and practices, farmers utilize a variety of GPS, variable-rate, and other digital agriculture technologies. However, digital farming is not restricted to the industrial end of the agricultural spectrum. When I talked to Amy, an urban farmer running a CSA and restaurant supply company in Detroit, she also relied heavily on an application to keep track of the multitude of planting decisions, customer orders, and management practices.

I couldn't do it without [the app]. Every square foot of the property that I have needs to be making money. A lot of these plots, I have two or three rotations going into them per season. I have to know what I'm going to need

for different customers in September when I make planting decisions in March. The app lets me keep track of all of that in one place so things don't get out of control.

Like the large-scale farmers, Amy's farm needs to produce both financially and in terms of yield. To achieve this goal, Amy uses computer technology in order to assist her in the decisions she makes. Although the process of data input involves Amy manually entering it into the app rather than going through the interface of a soil sample or a yield monitor, the goal remains the same: make production efficient. In this way, some ecological farmers meld parts of the logic of ecological agriculture with the goals of industrial agriculture.

#### *More Radical Visions of Ecological Agriculture*

The practice of agroecology seeks to model agricultural systems after natural ones. In this way, the logic of impact science argues that the artificiality of the industrial agriculture system can be corrected by seeking a more "natural" approach to farming. The range of techniques for agroecological farming is wide, but it typically involves using scientific understandings of natural systems in order to mirror such systems within a farm. When I asked Christopher what principles guide his farming decisions, he had this to say:

The principle I think that's most important to me is agroecology. We try to look at the ecology of the area that we're in and find the best ways to do something as similar as possible while also trying to meet our own goals.

Importantly, as Christopher says, the goal is not merely to mimic nature, but to mimic nature in such a way that the goals of the farm are achieved. As agroecological farmer Jake told me, "I'm

not trying to *be* nature, I'm trying to farm." Still, the agroecological perspective is to mirror natural processes within an agricultural system in order to produce food in a manner that also participates beneficially in the local ecology.

One of the main methods for practicing agroecology is to ensure that the farm is polycultural. In contrast to the monoculture system of industrial farming, which focuses on growing as much of a single agricultural product (whether crop or livestock) as possible, polyculture seeks to mimic nature by expanding the variety of products being grown. As discussed in the previous section, produce and flower growers such as Cara interplant vegetables in order to facilitate cross-pollination and create beneficial micro-environments. Likewise, Amy's urban farm uses a polyculture approach to minimize the effect of pests.

I try to mix everything up, you know? I plant some cucumbers over here next to some salad greens, but some of them go over there next to the radishes. That way, if I get some bugs in one set of cucumbers, I don't lose all of my cucumbers... I have a sort of buffer that way.

From this perspective, the monoculture system of industrial agriculture is problematic in part because it becomes a breeding ground for pests. If a particular pest is well-suited to eat a given crop, putting them all together in a field means the pest can proliferate.

Ecological farmers argue that this method likewise mirrors nature in that balance is encouraged. Rather than trying to eliminate the problem of pests through chemicals, pests are understood to be part of the natural world. In fact, by encouraging diversity within an agroecological system, ecological farmers find that they can encourage so-called "beneficial

bugs,” which feed on pests. Nicole, who grows a substantial garden in addition to operating the organic mill with Justin, said this balancing act can sometimes take several years to work:

When we first started out, it was tough. That’s something they don’t always tell you, right? [laughs] We had every pest in the book. You name it, we had it. But then I started reading about how if you encourage stuff like ladybugs or praying mantises in your garden, they eat some of the aphids and other gross ones that will totally wreck your garden... Once we... stopped trying to get rid of the pests and started encouraging more bugs that we wanted there, it kind of started to balance out.

Many of the ecological farmers echoed Nicole’s sentiment that it can take some time to find a balance in an agroecological system. Furthermore, many also found it difficult to overcome the inclination to try to get rid of pests. For many ecological farmers, overcoming the urge to sterilize the agricultural system and instead encourage diversity was a major key to success in the logic of ecological agriculture.

If polyculture was a major steppingstone in achieving the goals of agroecology for ecological farmers, a peak is using integrated crop and livestock systems. Many ecological farmers emphasized that if the goal in agroecology is to mirror natural systems, one must consider the role of animals. Once again, this builds upon the rotational grazing methods pioneered by scholars such as Allan Savory and popularized by Joel Salatin. In this method, livestock such as cattle are used to mimic the behavior of large herbivores such as buffalo in the United States and the cape buffalo in Africa, where Savory built his research. Whereas cattle

are often seen as environmentally destructive, this perspective argues that agriculture is obliged to use cattle in a way which mirrors the grazing, waste, and movement patterns of large buffalo herds. Whereas buffalo grazed the prairies of what is now the United States, defecating and urinating as they went and moving large distances to avoid predators, modern ecological farmers use electric fencing to move herds of cattle into relatively small pastures for short periods of time. These cattle graze the grass in their confined pen, encouraging new growth, and fertilizing the ground with their own feces and urine.

Although many ecological farmers operated farms that were too small to handle large livestock, many incorporated smaller livestock such as chickens or other poultry birds. By raising chickens on pastures, the chickens get a significant portion of their sustenance from grazing and fertilize the soil with their waste. Although Cara's main operation consisted of flowers and produce, she kept chickens for the purpose of providing fertility to future flower beds:

Every year I put the chickens... where I want to put a bed next year. That way, they do a pretty good job of weeding it for me, then when I get around to planting that bed next year, they've gone ahead and fertilized it for me with the added benefit of eggs!

In addition to providing fertility for future flower beds, Cara's chickens also serve as a type of garbage disposal. She told me that in addition to the grazing and chicken feed she provides for her flock, she also gives them all of her scraps from her own kitchen. That way, the waste that Cara makes turns into fertility for her soil, mirroring the metabolic processes of natural systems.

For those ecological farmers operating on a slightly larger scale, large livestock animals such as cows, pigs, and sheep play a significant role in achieving the goals of agroecology. In fact, for many, large livestock are the key to both making a significant positive impact on the environment and making decent money as an ecological farmer. Here, Karen emphasizes the ecological benefits of using rotational grazing with cattle:

We could not have made the contributions to topsoil and organic matter and all that without the cattle. I always tell people, “It’s the cows that do the work, I’m just benefitting,” ... and it’s true. Moving the cows through the pastures and keeping them on good grass—it’s good for them, it’s good for us, and it’s good for the soils... Then the grass that grows in those pastures the next year are even better.

As mentioned in the section on discourse, Karen takes pride in the rising quality of the soil on her farm. For her, the goal of benefitting the environment while staying profitable is served best by using bio-mimicking rotational grazing techniques. In addition to providing high quality beef, Karen argues that rotational grazing techniques is part of a larger integrated system intended to improve the quality of the vegetation on which her animals feed. As a grass-based grazing operation, pastures essentially become a crop to be managed in the same way other farmers grow corn or vegetables. In this case, the integrated system that Karen uses models nature through a cyclical process whereby the animal management techniques serve to improve the quality of the crop (grass), which subsequently serves to improve the quality of the ultimate agricultural product (beef).

The wide variety of practices discussed here demonstrate the various possible goals within the logic of ecological agriculture. For farmers interested in dipping their toes into the logic of ecological agriculture, practices such as no-till and cover crops can serve as a meaningful way to incorporate new techniques without fundamentally changing the nature of their operation. These practices are increasingly being encouraged by governments and businesses, as parties become interested in utilizing agriculture to combat climate change. Although criticisms of these approaches abound among industrial farmers, more radical ecological farmers also argue that cover crops and no-till are merely the beginning of a paradigm shift in modern agriculture. For these farmers, the industrial model of agriculture must be radically altered in a manner more in-line with natural systems. Rather than attempting to make industrial monoculture systems more sustainable, radical ecological farmers propose systems that maximize diversity, both by inter-planting a variety of crop species and by integrating livestock and crops within a single agricultural system. These views are built upon impact science and as such, manifest a radical departure from the logic of industrial agriculture.

### 2.2.3 Impact Science View of Industrial Agriculture

As with industrial farmers, ecological farmers define themselves in terms of their own practices and discourse, but also in opposition to industrial farmers. For ecological farmers especially, much of the practice and discourse comes directly from a critique of the industrial farming system. For many ecological farmers, criticism of the processes and practices of industrial agriculture furnished by impact science forms the basis of a worldview. This worldview often came with an origin story of how the farmer came to recognize the downsides of industrial



agriculture and begin to practice an alternative. Whereas twenty-two of the twenty-six industrial farmers grew up in families who farmed, only eight of the twenty-five ecological farmers did. As such, the majority of ecological farmers came to farming as an adult, many from very different careers.

Ecological farmers' origin stories came in several varieties. For many, concerns about the environment constituted the major reasoning for beginning an ecological farming practice. Whether through the various documentaries exposing the environmental effects of industrial farming, connections made through close friends, or direct experience, these farmers were inspired by what they perceived as the devastating environmental impacts of industrial agriculture. For others, the stimulating concern was regarding the health impacts of industrial agriculture. From this perspective, methods of industrial agricultural production such as pesticides, GMOs, and dairy processing are the cause of myriad health problems, from obesity to autism. Finally, some found animal welfare concerns to be their most stimulating factor, particularly as it relates to perceptions of food quality. For this group, the "naturalness" of an animal's environment necessarily contributes to the quality of the meat or other product it produces. This was true both in the sense that the food was perceived to have better flavor and in the sense that producing and consuming more ecologically-minded animal food products constitute part of a high-quality lifestyle. In all areas, ecological farmers utilized the logic of impact science, defining themselves in opposition to industrial agriculture using a combination of cutting-edge modern science and more traditional forms of knowledge.

### *Ecological Farming Origin Stories*

For farmers operating within the logic of ecological agriculture, environmental concerns often form the basis of agricultural practice. When I asked ecological farmers how they came to farm ecologically, twelve out of twenty-five listed environmental concerns as a major reason.<sup>19</sup> These environmental concerns come in a fairly wide variety, and often do not fall along clear-cut lines of “environmentalism.” That is, concern regarding one area of environmental impacts of agriculture does not necessarily indicate concern in other areas. On one end of the spectrum, some farmers were particularly concerned about the increasing expansion of agriculture into natural habitats. For these farmers, industrial farmers were perceived as continually expansive, harming resources necessary for both natural beauty and hunting (a common recreational activity for many farmers). Further along the spectrum, some farmers were particularly concerned about chemical runoff from agricultural fields. When this topic was mentioned, farmers frequently brought up hypoxic zones in the Gulf of Mexico. Once again, this issue is partly about wildlife habitats, but also includes a concern for the impact of farming on a larger scale. On the far end of the spectrum, some ecological farmers were concerned about agriculture’s contribution to climate change. These farmers see the industrial agriculture system as fundamentally in denial of science. Despite this range of concerns, these ecological farmers were united in their belief that with proper management, agriculture can and should contribute positively to the environment. It is from this belief that these ecological farmers build their practice.

---

<sup>19</sup> Farmers often listed several major reasons for ecological farming. As such, individual farmers are listed in multiple sections here including environmental concerns, health issues, and quality.

Many of the ecological farmers who were not particularly concerned about climate change or chemical run-off were more interested in the impact of agriculture on the local landscape. Out of the twelve ecological farmers who mentioned environmental concerns as a major reason for practicing ecological farming, four mentioned these landscape changes as their main environmental concern. All four were younger men who practiced ecological agriculture on a fairly large scale. For example, Marcus, who runs a sizeable organic apple orchard said the expansion of agricultural land as one of his main issues with industrial agriculture.

You have to leave stuff for nature, I think. We have over 150 acres here, but I'd guess...something like thirty or forty of that is natural...we don't do anything to it. The guys down the street though, they're going to plow up as much as they can.

The "guys down the street" for Marcus is a large industrial row crop farm. From Marcus' point of view, leaving a substantial portion of his property for natural habitat is important. In fact, it was the only point in our conversation that Marcus explicitly differentiated himself from the industrial "guys down the street." It is worth noting that Marcus later told me that the area they leave unfarmed does have trails that they take agri-tourists through in the fall. In that way, the natural landscape is actually part of a larger business model that is only partially constituted by selling apples and apple products from the orchard. Still, as this quote shows, part of Marcus' identity as an organic farmer manifests in this instance of difference. As an organic farmer, Marcus values the natural landscape and sees the expansion of industrial agriculture into natural habitats as something to resist.

Whereas Marcus valued the land both for its natural beauty and for its contribution to a larger natural/organic business model, others took issue with the impact of agricultural expansion on wildlife habitats. In particular, several farmers took issue with what they perceived to be a decreasing availability of game animals as a result of shrinking and discontinuous wildlife habitats. Phil, who operates a pasture-based livestock operation, took particular issue with the expansion of farm operations after the 2008 financial crisis:

You had 2008 [the beginning of the Great Recession], and all these mom and pops had to sell [their farms]. Well who's bought those? The big guys. And what did those guys do? They plowed as much ground as possible and f--- the DNR [Department of Natural Resources officer] who's going to tell them they can't. But I used to hunt pheasants in my backyard and now they're just not there... You need continuous habitat for a lot of game, not just little swales throughout a field... and these big farmers have just wrecked it.

For Phil, the impact of agricultural expansion was literally in his own backyard. In addition to the perception of somewhat exploitative behavior in the course of the financial crisis (an issue that will be discussed at length in the section on economics), Phil argued that the transfer of land from small farmers to larger operations came with what he later described as “greedy” expansion. Furthermore, as demonstrated by his comment about the DNR, Phil perceives large farmers to be scofflaws, breaking rules without concern for punishment.

The concerns of farmers like Marcus and Phil are quite localized. In both quotations, these farmers refer to their immediate environments. Marcus contrasts his own value for

undisturbed natural landscapes to the expansive mentality of the “guys down the street.”

Likewise, Phil’s issue with agricultural expansion centers on his own backyard and his reduced ability to hunt game. For both Marcus and Phil, these local concerns stimulated alternative practices that seek to counter these negative effects.

For other farmers, however, environmental concerns expand beyond the immediate vicinity of the farm and home. For these farmers, the industrial agricultural system creates deleterious environmental impacts far beyond the immediate environment. Ecological farming practice therefore becomes a localized response to a national and global problem. In particular, these concerns often focus on the deleterious environmental impacts of agricultural chemicals. Of course, concerns about agrichemicals are also related to health concerns, which will be discussed the next subsection. In the context of environmental concerns, however, the most common concern related to environmental chemicals is the hypoxic zone in the Gulf of Mexico. Out of the twelve people who mentioned environmental concerns as a major reason for practicing ecological agriculture, three mentioned chemical runoff and the hypoxic zone in the Gulf of Mexico as a major issue.

Further disembedding this issue from the local context, the farmers who brought up this issue usually pointed to farmers in Iowa as the main culprit for chemical runoff leading to hypoxia in the Gulf of Mexico. This perspective argued that agricultural fertilizers used on farms in Iowa runs from the fields into streams which ultimately empty into the Mississippi River. From there, fertilizer and topsoil flow southward into the Gulf of Mexico, ultimately causing an area with decreased oxygen levels, which is harmful for fish and other aquatic wildlife. Here, Justin demonstrates his concern for this issue:

Do you know that Iowa has the most fertile soil on the planet and what do we do? Pump it full of nitrogen that runs right down to the Gulf of Mexico... All that good soil, right down the drain... I mean, what are we doing?

For Justin, this example illustrates the folly of industrial farming. In addition to sending nitrogen fertilizer to the Gulf of Mexico, Justin perceives industrial farmers to be wasting the naturally fertile soils in Iowa. In wasting this precious natural resource and polluting the environment, Justin perceives industrial farmers to be doubly at fault.

Whereas Justin's position on this topic was that the pollution of the Gulf of Mexico and the wasting of fertile soil are bad on their face, other farmers who took this perspective had more specific reasons why they found this issue concerning. Robin, who works at a farm that grows produce using hydroponic technology, gave several reasons why the chemical pollution is negative.

Well, all that fertilizer goes right down the Mississippi River and causes the hypoxic zone—you've heard of this? Think about how many fish die from that, not to mention the fishing industry down there... I just don't think it's ok to impact the world that way.

For Robin, the environmental effects of industrial farming are negative for both human and beyond-human life. For fish, exposure to the outputs of industrial agricultural production means death; for humans who depend on those fish, it means financial hardship. In this way, Robin criticizes the industrial agricultural model for its impact well beyond the immediate context of farming.

If the impact of agrichemicals beyond the immediate environment is one level of concern for ecological farmers, the next level is concern about agriculture's contribution to climate change. Of the twelve ecological farmers who mentioned environmental concern as a major concern, five said they were particularly concerned about climate change. For these farmers, industrial agriculture contributes to climate change in a number of ways. The first is through the burning of diesel fuel in the process of driving large farm equipment and trucks. The burning of fossil fuels was a major concern for Jake:

Every year it seems like these tractors get bigger – the combines, [all the equipment] is just getting huge. How much diesel are those things burning?

Plus you know you have to take all that corn... and take it across the country.

For Jake, the ever-increasing size of farm equipment, along with the long-distance supply chains of industrial agriculture means increased emissions from burning fossil fuels. Although Jake went on to include a host of reasons for criticizing industrial agriculture, emissions from burning fossil fuel constituted a major concern.

Although the burning of fossil fuels is a major cause of climate change and is connected to farming in this way, the more prominent contribution of agriculture to climate change is through the emission of methane from cows. With more than thirty times the warming effect of carbon dioxide, methane constitutes a major concern for climate scientists. Methane produced by livestock is a significant portion of global methane production and comes mostly from the digestive process of ruminant animals like cows. In order to break down grass, grain, and other cattle feed, cows utilize multiple stomachs during rumination, a process similar to

fermentation. One of the byproducts of rumination is methane, which is expelled mostly through belching, but also through flatulence. As such, many of the critics of industrial agriculture talk about “cow farts” and their contribution to climate change.

One such person was Karen, who runs a pasture-based beef operation. When I asked her if she was concerned about the impact of agriculture on the climate, she had this to say:

Well—when you have 10,000 cows all farting in one of those CAFOs [confined animal feeding operation], yeah I think it does affect the climate... That’s why we need more people moving toward these pasture systems.

For Karen, confined animal feeding operations are the problematic issue in animal agriculture. The methane produced by such operations is a major reason she decided to practice in a pasture-based system.

The claim regarding the difference in emissions between CAFOs and pasture-based systems is somewhat contested. Although CAFOs produce a larger amount of emissions, given the vastly increased concentration of animals, some critics argue that the efficiency of larger operations means each pound of beef that comes from CAFOs has fewer emissions associated with it. Because pasture-based animals are raised longer before being slaughtered for meat processing, theoretically they produce more lifetime greenhouse gas emissions. In addition, smaller pasture-based systems lack the efficiencies in transportation that larger meat production organizations have.

In response to these criticisms, some ecological farmers point to the potential for pasture-based systems to sequester carbon in the ground, as discussed in the previous section.



Others argue that ecological farming represents just part of a larger change in the food system required for sustainability. For these farmers, the greenhouse gasses emitted by the agricultural industry require not just more sustainable farming practices, but also significant changes in the diet of Americans. Specifically, these farmers argue that changes to the food system must include a reduction in the amount of meat consumed and a transition toward plant-based sources of protein. For Anna, who works on organic horticulture in a university, this change is an obvious step.

We can do as much organic or regenerative or whatever you want to call it, ok?... And that's great. But the problem when it comes to climate change is that we're just eating too much meat... Not everyone has to be vegetarian. I get that. But... Meatless Mondays, those sorts of things. We're going to have to do more of that.

With techniques like "Meatless Mondays," where people choose to cut meat out of their diet for a single alliterative day of the week, Anna argues that our society can move slowly toward a less meat-intensive diet. Although Anna recognizes that not everyone will adopt her own diet of full vegetarianism, she argues that shifting a large group of people away from a portion of their meat consumption will be key to mitigating the effects of climate change.

When it comes to environmental concern, ecological farmers display a wide range of particular issues. Although some ecological farmers like Karen and Anna take an expansive view of the environmental impacts of industrial agriculture, others focus more exclusively on the effects on the immediate environment. These different scales of concern demonstrate the wide

range of environmental issues from which ecological farmers build their own agricultural practice. If climate change and natural habitat destruction represent far ends of the scales of environmental concerns, health concerns represent an even more micro-scale concern. When it comes to concerns regarding the effects of industrial agriculture on human health, the environmental impact of industrial agriculture is internalized within human bodies. This creates a strong motivation for action and change based on impact science.

### *The Impact of Industrial Agriculture on Human Health*

For ecological farmers, one of the major factors for engaging in ecological practice is the health effects of the industrial agriculture system. At both the individual and social level, ecological farmers were very concerned about the health effects of the industrial agricultural system. In fact, of the twenty-one ecological farmers, fifteen mentioned health concerns associated with industrial farming system. The specific concerns about the health effects of industrial farming do vary significantly, however. For some, health concerns mostly center on the impact of the food system on rates of obesity and other chronic illnesses. For others, concerns mostly focus on the connection between commonly-used agrichemicals and cancer. Farmers concerned about obesity in the food system and the carcinogenic effects of agrichemicals mostly position themselves as on the side of modern science that supports their position. A third group of ecological farmers, however, find themselves in opposition to what they perceive as mainstream science. For these farmers, concern about the health effects of GMOs and modern dairy processing techniques come from sources they consider to be scientific, even if they contradict mainstream scientific conclusions. For all ecological farmers who said that health concerns were a major reason for practicing ecological agriculture, the intimate nature of the

individual health effects of industrial farming constituted a powerful motivation for alternative practice.

Of the fifteen ecological farmers that mentioned health issues as a major concern, five said they were particularly concerned about the effect of the industrial food system on rates of obesity in the developed world. According to this perspective, a major problem with the industrial food system is that it encourages people to eat more than they should of the wrong sorts of food. For example, the industrial food system is blamed for higher rates of meat consumption, carbohydrate intake, and sugar consumption than is considered healthy. Furthermore, the industrial food system is accused of not providing enough healthy options, such as leafy greens and other vegetables. These ecological farmers argue that these factors create an environment in which it becomes exceedingly difficult for individuals to maintain a healthy weight.

Meat consumption was a particularly common topic for the ecological farmers in this category. Several of these farmers argued that the health effects of excessive meat consumption constitutes an additional reason to curtail animal agriculture in addition to the effects of livestock on climate change. Cheryl, who runs a small roadside market to sell the organic produce she grows in her backyard, took climate change and obesity to be part of the same issue. After explaining her concern about climate change and agriculture, she argued that:

Well... it's all the same problem. We have too many cows because we eat too much meat. If we didn't eat so much meat, we wouldn't need as many cows,

and we'd probably all be a hell of a lot healthier, too... We stopped eating red meat six years ago and my numbers have improved... dramatically.

For Cheryl, the connection between the earth and the body is clear. The impact of industrially-grown livestock is present both in rising global temperatures and expanding waistlines, particularly in the United States. After coming to this conclusion, Cheryl took it upon herself to change her diet in order to be both more healthy and more sustainable.

Whereas Cheryl was concerned about the impact of meat consumption, other ecological farmers in this group were more concerned about the broad availability of cheap, processed foods with additives such as high-fructose corn syrup. For these farmers, the availability of unhealthy food items is the result of an illogical agricultural system that benefits large producers and processors, making unhealthy food more affordable and available relative to healthy options. Here, Amy argues that this system makes it difficult for people to eat healthy, especially those near her farm in the Detroit area:

The closest grocery store to here is 7 miles away. A lot of people shop at the [convenience store], and what do they have there? Well, the cheapest stuff is going to be the most processed, and it's tough to find any sort of whole foods... Maybe you can find a banana or an apple or something like that, but the processed foods are just easier to grab.

This description of a classic food desert is a common issue in the Detroit area. The scarcity of grocery stores and the necessity of driving makes it difficult for low-income residents to access quality foods. As a result, the food that is available in these areas often has lower nutritional

density and, as Amy puts it, is “the most processed.” Even when there are whole foods such as bananas or apples available, Amy argues that unhealthy options will be easier, and therefore more likely to be purchased and consumed.

For ecological farmers concerned about the health impacts of the industrial agricultural system, the chronic effects of unhealthy foods are only the tip of the iceberg. A more sinister threat of the industrial system is the health effects of agrichemicals. At the most basic level, ecological farmers question the need to kill things in the process of farming. Within the logic of ecological agriculture, killing pests with chemicals has inevitable consequences on the body. Luke, who runs an urban farm on the west side of the state has this to say:

I saw this documentary and this little girl asked why we need to kill things to make things grow and I just thought that was really poignant. If those chemicals are killing plants or insects or whatever, you don't think that's going to hurt us too, eventually?

This perspective from Luke falls within the larger logic of ecological agriculture of working in harmony with nature. Although Luke shapes his own farm to meet his needs, he does so while working with nature, rather than against it. By killing various organisms using chemicals, Luke perceives the industrial system to be working against nature, and ultimately against humans. Furthermore, the stimulating event for Luke to have this realization was from a documentary that shared this perspective from the point of view of a little girl. That this message came “from the mouths of babes” makes it particularly strong; the perceived naturalness of a child's perspective legitimates the content of the message.

Whereas Luke made the rather broad connection between agrichemicals and human health, other ecological farmers connected chemicals to particular diseases. In particular, many of the ecological farmers I spoke with argued that the heavy use of agrichemicals is related to high rates of various forms of cancer. For some, this connection was made in relation to court cases involving glyphosate. When I asked Sandra, an urban farmer in the Detroit area, what brought her to ecological farming, she immediately pointed to Bayer/Monsanto's court case regarding glyphosate.

Oh, it was the chemicals. I put a lot of shit in my body when I was younger, then I saw that guy got cancer from using Roundup and I learned from [my mentor] how much Roundup gets used in agriculture.

For Sandra, the initiative to begin ecological farming came from the combination of hearing about the court case in which Bayer/Monsanto was sued for selling carcinogenic products, becoming educated on the use of Roundup in agriculture, and the recognition of the unhealthiness of the food she had been consuming. From the perspective of Sandra and several other ecological farmers, the carcinogenic nature of Roundup was obvious. Once again, for these farmers, the ill effects of agrichemicals are an inherent part of the logic of industrial agriculture.

In addition to the ill effects of agrichemicals, several ecological farmers mentioned their concerns about genetically modified food. Of the fifteen farmers that mentioned the health effects of the industrial agriculture system, four said they were concerned about the safety of GMOs. For James, the concern was specifically the carcinogenic effects of GMOs. As he said,

“You watch. That shit *will* give people cancer.” For the other three, the concern was less specific about cancer and more about a broad uncertainty about the effects of GMOs. Harriet, who runs an organic farm in central Michigan, was concerned that we simply don’t know what effects GMOs will have in the long term.

I just don’t think anyone knows, you know? They’re changing these [genes]

and sure it might not cause harm right away, but what about in ten years?

Twenty years? A hundred?... It’s just... not a path I’d like to be on, personally.

Harriet’s concern falls within what might be considered the “Frankenfood” perspective on GMOs. Whereas James’ concern is with the specifically carcinogenic effects of GMOs (which is a significant portion of the anti-GMO concern), the Frankenfood perspective argues, rather, that we simply cannot know what downsides GMOs might eventually bring. From this perspective, GMOs are particularly sinister because they manipulate plants at the level of genetics. The three farmers who were concerned about the health effects of GMOs in this general sense fell neatly within the Frankenfood perspective. Note that although these farmers were particularly concerned about GMOs, this concern was not shared widely by ecological farmers.

If concerns about GMOs is somewhat related to industrial farmers “playing God,” proponents of raw milk argued that modern dairy processing destroys a product that is a perfect gift from God. Although only two farmers were enthusiastic about raw milk, both explicitly referenced their Christian faith as part of their justification for producing and drinking

raw milk. Jan, who runs a raw milk program,<sup>20</sup> made several references to the Bible, including this one:

They talk about drinking milk in the Bible. Ok, and they weren't doing pasteurization then, right? That's because milk—goat's milk, cow's milk, sheep's milk—whatever it is, it comes from God.

Jan's argument takes the argument about the unnatural nature of the industrial agriculture system one step further to say not only is raw milk more natural than processed milk, but that its naturalness is partly proven by its provisioning by God Himself. In addition to the arguments made by other ecological farmers that the logic of industrial agriculture goes against natural systems, Jan's perspective is that the industrial agriculture system is also blasphemous and sinful.

It is worth making several points before going forward. The first is that although both Jan and Karen (the other raw milk enthusiast) partly legitimated their enthusiasm for raw milk by connecting it to their Christian faith, they were not the only ones to bring this topic up. Several industrial farmers referenced God multiple times during our conversation, usually saying either that they were blessed to be farming their land or that they were only as successful as they were through God's blessing.

---

<sup>20</sup> This language is specific and intentional. The operation that Jan runs is collectively owned through "herd-shares." In the state of Michigan, it is illegal to sell raw milk, but you are allowed to drink raw milk from a cow that you own. As such, Jan's operation requires participants to own shares in the herd, which then entitles them to a certain portion of the milk produced each week. This way, Jan doesn't sell participants milk, but merely takes care of the collectively-owned cows and runs the dairy production operation.



A second point to make here is that although Jan and Karen's perspective on raw milk is fairly consistent with the general logic of ecological agriculture, they were the only two who supported this particular topic. Most of the other ecological farmers did not mention raw milk, and several who did said they were not interested in it. Furthermore, many of the industrial dairy farmers were generally in support of raw milk, though mostly for their own consumption and not for the scale of mass production.

Finally, although both Karen and Jan used biblical references to legitimize their perspective on raw milk, they were also convinced that the science also backed them up. For example, Karen started using raw milk when her daughter started having allergic reactions to a variety of food products.

She would eat just, you know, normal food you buy at the grocery store, and she'd have these terrible allergic reactions...We figured out that we needed to have totally clean food...We started buying raw milk and so many good things happened. It's a super food. There's just so much in there that's good for your gut and they take it all out by processing it!

For Karen, her daughter's allergic reactions were at least partially cured by the naturalness of raw milk. Although she recognizes that the processing (pasteurization and homogenization) can be necessary on the massive scales used in industrial dairy farming, Karen is also convinced that the biology of raw milk is beneficial for her daughter's health. In this way, her perspective of the natural and god-giveness of milk is at least not in conflict with scientific reality. Although both

Jan and Karen recognized that they were in opposition to the scientific consensus, they positioned themselves as anti-mainstream, rather than anti-science.

### *High Quality of Ecological Agriculture Products*

The final way that ecological farmers compared the knowledge generated by the logic of impact science against the knowledge of industrial agriculture was in the quality of products produced by ecological farming. As we have seen, many argued that the products of ecological agriculture are healthier for human bodies, which is, of course related to quality. However, many also argued that the experience of consuming ecological products—from vegetables to meat to eggs—far surpasses that of industrial products. Many ecological farmers argued that their perception of the superior quality of their own products is supported by science. From better gut health and fewer stress hormones in pasture-raised livestock to higher nutritional content in organic tomatoes, ecological farmers were convinced that science supported their perception of quality. Perhaps more importantly, however, the perception of quality was supported by the personal experiences of ecological farmers. For these farmers as well as many of their customers, ecological agriculture is part of a high-quality lifestyle in which food plays a fundamental role.

One of the main ways that ecological farmers use science to support their claims of quality is nutritional density. From this perspective, the value of the practices associated with ecological farming are literally embedded within the products that are produced. In other words, ecological farmers legitimate the quality of their own practices by using the scientific language of nutritional density. Of course, nutritional density in this sense is only meaningful in

relation to the products of the industrial agriculture system. I asked Nicole what she thought made the products of her mill and garden taste better than normal store-bought food and she had this to say:

They've done studies that show that this stuff has more vitamins. I think that's just the tip of the iceberg. I really think there's just so much more good stuff in a tomato I grow in my backyard than one that I'd buy in a store that was mass-produced in a greenhouse or in California or something like that.

Note here that Nicole's justification for the nutritional density begins with an assertion of the scientific basis. After asserting that the science shows that home-grown produce has more vitamins, she builds to say that she believes there are additional benefits. Also, Nicole's sense of nutritional density does not exist solely within the products she grows, but in contrast to "mass-produced" produce. It is the mass-production producers who make products against which Nicole can compare her own. That is, Nicole's tomatoes are not merely nutritionally dense: they are *more* nutritionally dense.

I noticed a similar dynamic for ecological farmers who focused on livestock production. Of the six farmers whose primary business centered on ecologically-raised livestock,<sup>21</sup> four used scientific reasoning to argue for the quality of their animal products. Of these, Paul was the most explicit about the connection between pasture-raising livestock and the scientific quality of the subsequent meat.

---

<sup>21</sup> These six had businesses that were almost entirely focused on animal products, including meat, milk, and eggs. Many other ecological farmers had a small number of animals that supplemented their much larger operation that focused on produce.

You put these steers on a pasture... in their natural environment, [they're] going to have less stress hormones. [Their] gut biome is going to work a hell of a lot better than it would in a feedlot... All of that translates into good marbling, lots of flavor.

For Paul, the connection between raising an animal in its “natural environment” and the quality of food product is obvious. Once again, we see the necessity of the industrial system for comparative purposes. Furthermore, we see Paul referring to stress hormones and the health of the gut biome as biological reasons why raising steers on a pasture leads to quality meat.

Importantly, though, many of the ecological farmers preferred their personal experience with the quality of their food over any scientific argument. For these farmers, both the process of farming and the experience of eating quality food is part of a lifestyle that values a direct and harmonious relationship with the earth. For these farmers, the food produced by ecological agriculture is of higher quality because the experience of eating it is a superior experience. In this context, rather than an external and scientific validation for the superior quality of ecological food, the only validation needed is one's own palate. Karen's perspective on this topic was enthusiastic:

I won't even eat meat that hasn't been raised on pasture. It just doesn't taste as good. The flavor's bland. It doesn't have any life. Once you taste something that's grown the right way, you can't go back.

The “right way” for Karen is the way that follows the logic of ecological farming, seeking to work in harmony with nature. The subjective experience of consuming meat produced in this way confirms the quality of the product, particularly as compared to the “bland” flavor of the industrial version.

This perspective was shared by many of the ecological farmers. Many also argued that their customers felt the same way. When I asked Cheryl why she thought her customers came from as far as Chicago to get food at her roadside stand, she said:

[I] think people are really looking to get that connection to their food. They want to know where it came from, who grew it, and know that it's quality. When they bite into a cucumber they bought from here, it's just different than the store [bought variety] ... I can't say for sure what makes it different, but I can tell you I think it tastes better and a lot of these folks have told me the same.

In this way, Cheryl understands the logic of ecological agriculture to be central to her business in two ways. The first is that her customers need to know her has a practitioner of ecological agriculture in order for those standards of quality to be transposed onto the product. That is, Cheryl's customers need to know Cheryl and understand her practices (likely, again, in opposition to industrial agriculture) in order to feel a “connection to their food.” In addition, the food itself needs to be notably different in the experience of its consumption. Although I will say that the cucumber I ended up buying from Cheryl's stand was quite tasty, I am not here to arbitrate on the relative quality of different agricultural products. The point here is that

Cheryl's customers need to *know* that her products, at least partially because of the characteristics of their production, are of higher quality.

### *Summary*

Ecological farmers come to their practice from a variety of perspectives. For some, the environmental impact of industrial farming, whether from the destruction of wildlife habitat or from the release of greenhouse gasses, stimulated them to begin an alternative practice. For others, the health effects of the food system that is built on industrial agriculture was the main factor instigating their ecological practice. For yet others, ecological agriculture simply creates food products that are higher in quality compared to their industrial counterparts. For all of the ecological farmers, there is a recognition that their own practice is in contrast to the industrial agricultural system.

Although I prefer and have used the term “ecological farmer” throughout this project, many of the farmers referred to “alternative agriculture,” “alternative farming,” and even spoke about an “alternative food system.” This alternative system is not just alternative, but also superior; it is an attempt to make a *better* agrifood system. This alternative and superior practice is built from the *knowledge* of the pitfalls of industrial agriculture. This knowledge uses impact science to measure and demonstrate these pitfalls. Importantly, the knowledge system of the institutional logic of ecological agriculture includes input from outside of the mainstream scientific field, including indigenous knowledge, pre-industrial techniques, as well as personal experience.

#### 2.2.4 Summary of Knowledge within the Logic of Ecological Farmers

Talking to ecological farmers is clearly far different from talking to industrial farmers. Though their practices and discourse, ecological farmers demonstrate a worldview that both criticizes mainstream agriculture and seeks to develop a better model. In building a better model, ecological farmers use impact science as an epistemic base. In contrast to the profit-then-yield orientation of the production science model, impact science is oriented toward diagnosing the problems inherent within the industrial agriculture system and utilizing alternative sources of knowledge to construct an alternative.

The oppositional frame is central for ecological farmers. Whereas industrial farmers used organic agriculture as a particular “other” with whom to compare themselves as part of building a farming identity, opposition to the industrial agriculture system is foundational to the identity of the ecological farmers. Ecological farmers seek to create an alternative food system because they *know* the mainstream, industrial system to be lacking. This knowledge is supported by impact science, which uses wide range of knowledge production systems to both demonstrate the degradative effects of industrial agriculture on environments including human and non-human bodies as well as what might be called “nature.”

Impact science within the context of ecological agriculture implicates a variety of discourses and practices, all of which form a loose coherence. By recognizing the degradation of human and non-human environments perpetrated by the industrial agriculture system, impact science puts the *impact* of agricultural behavior at the center. As such, the goal becomes the health of such environments, measured conceptually by the *lack* of obesity, carbon emissions,

and rates of chemical pollution as well as the *presence* of high-quality, nutritious food, animal welfare, carbon sequestration, and harmony with nature.

A significant shift is necessary in order to achieve such goals. First, ecological farmers must recognize themselves as existing within an ecosystem of organisms with goals sometimes at odds, but potentially in-line with their own. The goal of an ecological farmer is to insert oneself into this ecosystem and mold it to meet one's own ends. The earth itself, as opposed to the inert substrate of dirt and ground used by industrial farmers, becomes a living and dynamic system in the soil. In this way, the land itself develops a character; it becomes an entity with which to interact as one would another person. Farming becomes a negotiation and collaboration between the ecological farmer and their land, rather than a battle for mastery.

But of course, the farmer must come to know the character of their land intimately and learn to recognize its needs. Rather than seeking to make the land uniform in order to extract products out of it as one would a factory, the ecological farmer seeks to mimic nature itself. Techniques such as polyculture and rotational grazing seek to be in harmony with natural systems by mimicking the diversity of nature and the behavior of large herbivores such as bison within the agricultural context. As such, ecological farmers use impact science to discern the levers of nature in order to push and pull them to their own ends.

A central dynamic within the knowledge system of ecological agriculture is the producers and distributors of such knowledge. Much of the distribution network appears to be relatively decentralized, relying on YouTube and other social media platforms rather than



agribusinesses or university extension offices.<sup>22</sup> Then again, the frequency of referrals to popular ecological farmers such as Alan Savory, Joel Salatin, and Greg Judy implies that to a certain degree, particular knowledge generators play a central role in the knowledge environment of the institutional logic of ecological agriculture. A major factor in the ability of these farmers to share their knowledge so widely is the ability to connect a criticism of the industrial agricultural system to an alternative system of agricultural practice that all fits within the same knowledge system.

Rather than relying on institutional reputation to legitimize knowledge, ecological farmers prefer knowledge produced outside of such institutions. That is, the sense of being an outsider is a common theme in the legitimation of knowledge within the institutional logic of ecological agriculture. Related to this theme is a value for knowledge from pre-industrial and indigenous sources. In this way, the mainstream agricultural knowledge-production sources are considered to be part of a collective detachment of modern society from its connection with the natural environment. Importantly, this perspective does not exclude the possibility of utilizing cutting-edge scientific knowledge and technology, even if produced by agribusinesses or university extension offices. However, knowledge from such institutions must cohere within the larger logic of ecological agriculture that includes the legitimacy of perceived counter-cultural values such as harmony with nature, living within an ecosystem, and respecting a diversity of knowledges.

---

<sup>22</sup> Of course, many universities with agriculture departments have scholars whose research focuses on developing new ecological agriculture knowledge and techniques. Additionally, a host of agribusinesses have been developed to supply ecological farmers with necessary products.

### 2.3 Conclusion: Polarization or Fragmentation in Agricultural Knowledge?

Impact and production science are knowledge systems within oppositional and conflicting institutional logics. As we have seen in each of the above sections, ecological and industrial farmers define themselves, at least in part in contrast to one another. From one perspective, industrial farmers are doing their darndest, using cutting edge science and technology to feed a growing national and global population while fighting against the vagaries of natural systems and working against a misinformed and ignorant public that criticizes their work. From the other perspective, ecological farmers are attempting to right the wrongs of modern society, particularly those made manifest by the environmental destruction of industrial agriculture. In this way, farming exists within and supports a larger narrative in contemporary American society of deep polarization and division.

As demonstrated by the host of examples above, this perspective of division and polarization is an accurate one. However, there is also more to this story. Significant overlap exists between the logics of ecological and industrial agriculture. Farming, whether from the cab of a half-million-dollar combine or in a small greenhouse, is about interacting with plants, animals, and the non-human world in way that few others in society understand. Although almost all the farmers I spoke with defined themselves in contrast with the opposite agricultural logic, they almost universally respected the *farmers* operating within it. That is, ecological farmers respected the livelihoods and work of their industrial farmer neighbors and vice versa, despite defining themselves in opposition to them. A variety of shared experiences and perspectives reinforced this mutual respect, including an oppositional and anti-mainstream

identity, as well a value for hands-on experience and a respect for the craft and tools of farming.

In addition to the overlap between the logics of ecological and industrial agriculture, there also exists significant fragmentation within each supposed pole. As we have seen, a wide range of perspectives exists within the logics of both ecological and industrial agriculture. For some industrial farmers, methods such as cover crops and no-till represent non-sensical interventions in farming, whereas for others, they are useful points of crossover between the logics of production and impact epistemologies. Likewise, some ecological farmers see their practice as a minor intervention that may be beneficial for conservation efforts whereas others see a more radical turn from the industrial system.

The contours of this fragmentation contribute to our understanding of the detailed variation within the existing polarization and the implications of such variation. I do not challenge the veracity and strength of the polarization narrative. Rather, I make a “yes, and” argument, pointing out that polarization exists in a host of variegated and complex ways. In this concluding chapter, I will argue that although the knowledge worlds of ecological and industrial farmers are distinct, they have commonalities and are each internally diverse. These commonalities and diversity challenge mainstream notions of “different worlds,” while pointing toward potential future syntheses.

|             | Industrial Agriculture<br>(Production Science)   | Ecological Agriculture<br>(Impact Science)   |
|-------------|--|--|
| Polarized   | <ul style="list-style-type: none"> <li>• “Dirt” as substrate; “Ground”</li> <li>• Battle against nature</li> <li>• Detailed information through technology → leads to higher production</li> </ul> | <ul style="list-style-type: none"> <li>• “Soil as living; personified; “Land”</li> <li>• Work with Nature; biomimicry; agroecology</li> <li>• Intimate knowledge of a particular place leads to better relationship with nature</li> </ul> |
| Fragmented  | <ul style="list-style-type: none"> <li>• No-till; cover crops</li> <li>• Generational differences</li> </ul>   | <ul style="list-style-type: none"> <li>• Reformism vs. revolutionism</li> <li>• Severity and solutions skepticism</li> <li>• GMOs</li> </ul>   |
| Overlapping | <ul style="list-style-type: none"> <li>• Populism; class politics</li> <li>• Digital knowing</li> <li>• Farming as a craft</li> <li>• GMOs</li> </ul>  |  |

### 2.3.1 Overlaps Between the Knowledge of Ecological and Industrial Farmers

In the popular narrative of the political landscape of the United States in the five to ten years leading up to 2020, polarization seems to be the dominant theme. Commentators speak as though Americans live in “different worlds,” using terms like “post-truth” and “fake news” to describe the perspective of the other political party. Of course, environmentalism and its relationship to the anti-industrial motives of ecological agriculture is part of this narrative. However, for the farmers on the ground, significant overlaps exist in at least two ways. The first is that there are dispositional similarities. Both ecological and industrial farmers share a particular worldview as the result of participating directly in agriculture. In addition, there are overlaps (some of which we have already seen) in the logics themselves. While there is

disagreement within each pole about the legitimacy of points of overlap (which will be discussed in the next section), there remains areas of potential collaboration between these logics otherwise presumed to be opponents.

To be an American farmer in the early part of the 21<sup>st</sup> century is to be an outsider. At least, that's the way farmers felt. In a world that seems increasingly to exist within television, computer, and smartphone screens, digging around in the dirt to grow food can feel antiquated, outdated, obsolete. Many of the farmers I spoke to explicitly referenced this feeling of otherness. These farmers take pride in their role as the fillers of American pantries, even though, and sometimes particularly because, they feel forgotten.

We saw this phenomenon among industrial farmers mostly in their responses to the logic of ecological agriculture. From the perspective of many industrial farmers, the popular belief about the destructiveness of their practices is the result of ignorance and misinformation. Industrial farmers thought that their practices deserved to be recognized as stewardship, often echoing the sentiment, "why would I hurt the land that I depend on for my livelihood?" For many of these farmers, this misinformation comes from urban and coastal "elites" who "don't know a damned thing about what I do here." In fact, an often-repeated anecdote was one in which one-time presidential candidate Michael Bloomberg said in an interview that he could "teach anyone to be a farmer... You dig a hole, you put a seed in, you put dirt on top, add water, up comes the corn," (AgDaily 2020). To industrial farmers, Bloomberg's comments prove what they believed all along: liberal coastal elites see them as unintelligent and their work as easy—something anyone could do. This oppositional identity became central to many industrial farmers.

Interestingly, a similar phenomenon existed among ecological farmers. Whereas industrial farmers found themselves in opposition to liberal coastal elites, many ecological farmers saw themselves fighting against the dominance of large agribusinesses and the federal farm policies that support them. From this perspective, farm policies that benefit large industrial farms at the expense of individual family operations are part of a larger system whereby wealth is concentrated in fewer and fewer hands. Of course, this system is also detrimental to the health of people and the environment, as short-sighted goals of profit come before concepts such as sustainability or population-level health. Once again, however, a certain ire is directed at an oppositional “other,” this time located both within large agribusinesses and a federal government seen as supporting special interests.

This similarity between ecological and industrial agriculture plays out in a mutual distrust for organic labeling. As we have seen, industrial farmers were particularly critical of ecological agriculture in the context of organic farming, which they see as a system that is easily cheated and profiting from misinformation among the public. Although many ecological farmers were certified organic, many were not. For some who were not certified organic, the issue was simple economics: the value of having a certified organic label failed to outweigh the costs of paying for certification. Furthermore, many practitioners of ecological agriculture also saw organic standards as fairly easy to evade while maintaining certification (in other words, easy to cheat), ultimately delegitimizing the certification in the eyes of ecological farmers. In this way, the oppositional identities of ecological and industrial farmers converged on opposition to organic certification. That the organic certification process is contained within the

USDA certainly contributes to this opposition, as both ecological and industrial farmers tend to be skeptical of intervention within farming at the federal level.

In a related instance of the overlaps in the dispositional nature of ecological and industrial farmers, almost all of the farmers I spoke with held a particular value for knowledge generated on their own farm. Although both ecological and industrial farmers highlighted their use of cutting-edge science, they were also almost universally skeptical about new techniques or products from outsiders. As one industrial farmer told me, “Farmers just tend to be really conservative in terms of their practices. You only get one chance a year, and if it doesn’t work out, you have to wait a whole year to try again.” Because of the cycles of nature that farming depends on, especially in Michigan, the windows within which farmers must act is fairly narrow. In addition, industrial farmers typically only get paid at the end of the year when they harvest their crop and sell it to the grain elevator. As such, farmers tend to wait to use the newest technology or product until it has been thoroughly vetted. Even then, farmers will often experiment with a new product on only part of their land in order to test it more thoroughly in their own environment. Ultimately, most industrial farmers trusted the years of knowledge passed down to them through previous generations and what they see with their own eyes.

Again, the same is true for ecological farmers. While many ecological farmers lean on the teachings of well-known farmers through YouTube and other means, they also have to apply it in their own settings. Ecological farmers valued their relationship with their particular piece of land highly. As such, the applicability of any particular technique, whether suggested by Joel Salatin or a neighbor down the street, is only valuable to the extent that it works *in this particular place*. Again, the value is placed on direct experience with farming in a particular

place. Although external knowledge may be helpful in some situations, ultimately it comes second to personal experience developed in the labor of farming.

This resistance among farmers to outside knowledge and the prioritization of knowledge produced on the farm is part of a larger sense of farming as a craft, as opposed to a science. Again, the point is not that farmers explicitly reject scientific findings and interventions, but that they prioritize tactile, immediately comprehensible, and thoroughly vetted knowledge. Whereas the “rest of the world” feels essentially disembodied—digital, ethereal, lacking in tactility and substance—farming feels real, material, and solid. Knowledge generated in the act of farming, whether it involves the ability to fix a complicated and colossal machine in the middle of a farm field or having an eye for when a particular piece of pasture is ready either to be grazed or needs rest, simply requires time in the field. This shared disposition of ecological and industrial farmers leads to a considerable amount of respect between them, despite respective criticisms of the opposing logic.

Indeed, despite the extent to which farmers defined themselves in opposition to their agricultural counterparts, when I asked farmers about their thoughts on neighbors who farmed with different practices, responses were often fairly positive. For example, although Marcus was highly critical of some of the practices of his neighbors, he also respected their work ethic, saying, “Those guys drive me up a wall sometimes but they’re good people. Nobody’s going to out work them, I’ll tell you that much.” This sentiment was echoed by Gary when I asked him about the organic farmstand down the road from his own farm. “Oh, I’ve bought stuff from them before – just when I’m passing by. They’re good folks.” In my conversations with both Marcus and Gary, they expressed strong opposition to the opposite agricultural logic. However,



discussing particular others with whom they had direct personal relationships, such opposition broke down. As Marcus' comment demonstrates, many farmers appreciate the hard work necessary for any type of farming. In addition, both Marcus and Gary's comments illustrate that although it can be easy to denounce the logic of another group, it becomes more difficult to criticize individuals who are known and respected.

In addition to these dispositional overlaps, there are overlaps in particular practices that some ecological and industrial farmers mutually embrace. Cover crops and no-till are perhaps the most obvious example of such an overlap. Proponents of cover crops and no-till argue that it is an area where the logics of ecological and industrial agriculture can avoid mutual exclusivity. That is, by utilizing cover crops and no-till in an otherwise traditionally industrial operation, farmers can achieve the ends of industrial agriculture while addressing the concerns of ecological agriculture. Theoretically the values of ecological diversity and recognizing the living nature of the soil can be satisfied without sacrificing long-term profitability and yield.<sup>23</sup> Although a significant number of both ecological and industrial farmers remain critical of whether these practices represent true overlap between the respective agricultural logics (at least partly because of the perceived oppositional nature between the two), others were enthusiastic about the potential crossover.

Furthermore, although many ecological farmers were critical of the social and environmental implications of GMOs, several argued that genetic modification of farm crops

---

<sup>23</sup> Proponents of using cover crops and no-till in industrial farming operations argue that farmers may experience an initial reduction in yield but will be rewarded by a decrease in costs through fewer chemical applications and passes of farm implements. Furthermore, they argue that these techniques can benefit yield long-term by increasing the health of the soil.

had at least the potential to contribute to ecological ends. For those opposed to GMOs, genetic modification represents an overextension of humanity's ability to control nature, sure to come back to bite us in a sort of Frankensteinian cause and effect. For these, genetic modification is fundamentally opposed to the logic of ecological agriculture. For others, the nature of GMOs is slightly more complicated. Although many recognized that GMOs could be harmful in that they force farmers into reliance on large agribusinesses, they also recognized the potential benefits of genetic modification. For example, genetic modification for pest resistance might lessen the need for harmful chemicals. Several ecological farmers also pointed to the example of golden rice, a variety genetically modified to contain Vitamin A in order to combat blindness caused from Vitamin A deficiency, as an example of the potential benefits of GMOs. Although the benefits of golden rice remain somewhat controversial (as many of the farmers pointed out), it remained an example of the potential for GMOs to be positive.

The final example of overlaps in practices between ecological and industrial farmers is precision agriculture. Here, we can think broadly of precision agriculture as using digital technology to heighten the efficiency, accuracy, and effectiveness of agricultural inputs. For industrial farmers, this looks like using complex digital tools to write chemical and planting prescriptions as well as GPS-connected farm implements to carry out such tasks. These tools allow industrial farmers to (theoretically) plant a variety of crop that meshes well with the particular environment in which it is planted and only apply the amount of chemical that a given piece of dirt can absorb and use, reducing potential overuse and runoff. For ecological farmers, this looks like using various apps and other digital tools to track planting and input decisions, along with managing the demands of customers. These tools allow ecological farmers

to align their production practices with the needs of their customers while keeping track of the complexity necessitated by valuing diversity and polyculture within a farming operation. In this way, precision agriculture constitutes an instance of overlap between ecological and industrial farmers in that industrial farmers' interests in production and profit can be aligned with ecological interests of decreasing runoff and chemical use while ecological farmers can align their own interests of mimicking the diversity and complexity of natural systems with the interests of serving customers. By offloading some of the cognitive work of farming to computers, farmers can use "digital knowing" to retain an intimate knowledge of the earth without sacrificing other parts of their logics.

In both their dispositions and their actual practices, ecological and industrial farmers are more similar than one would initially imagine. In popular media, industrial and ecological farmers are placed on opposite sides of a struggle for the future of farming. In many ways, this view is accurate. Farmers themselves often described the terrain of their farming practice in oppositional terms. However, the act of farming, whether it is industrial or ecological in its logic, confers particular ways of looking at the world. This complicates a strictly dichotomous story about polarization within the agricultural field by demonstrating the areas of overlap between the two poles. In addition to overlapping, however, there exist significant fragmentation within the ecological and industrial poles that also complicates a simple polarization thesis.

### 2.3.2 Fragmentation in the Knowledge of Ecological and Industrial Farmers

We have already seen significant fragmentation among farmers on a variety of issues. The simple fact is that although we often think of polarization as the creation of two opposing monoliths, the individuals making up such monoliths are extremely varied. The academic and sociological practice of constructing and discussing institutional logics is the creation of ideal types that no single individual matches exactly. Although these ideal types are certainly useful for the discussion of either the stasis or dynamics of institutional practice, they remain conceptual constructions, and as such, never match reality with perfect fidelity. Although it remains useful to discuss these institutional logics in ideal-typical terms, it is also useful to discuss the fragmentation of each pole, in order to gather a fuller understanding of the institutional dynamics at play.

The first instance of fragmentation within institutional poles of modern agriculture is on climate change. On the one hand, industrial farmers span the range of commonly-understood types of climate change skepticism, from trend skepticism to impact and attribution skepticism. Whatever the specific variety of skepticism was employed, the ultimate outcome was that farmers justified the continuation of their practices. Of course, what we also saw was an expansion of skepticism beyond these forms of skepticism. Specifically, attribution skepticism was extended to include a skepticism of the attribution of climate change to agricultural practice. That is, several of the farmers I spoke to about climate change questioned the legitimacy of pinning climate change on farmers, given their relatively simple lifestyles in relation to urban commuters driving on highways and flying in airplanes.

On the other hand, the variation on this issue among ecological farmers was of an altogether different type. None of the ecological farmers explicitly challenged the reality, impact, or attribution of climate change. However, there were significant differences between ecological farmers in the extent to which they pointed to climate change as a major concern. For some, climate change was one of the first topics listed when I asked how they had come to ecological farming. For these ecological farmers, the contribution of industrial agriculture to climate change necessitated an alternative approach—one which they took up with gusto. For others, climate change was a concern, but was not an instigating issue for their own practices. Rather, issues such as chemical pollution, human health, animal welfare, and food quality were more proximate and pressing concerns leading them to action.

We might understand ecological agriculture as embodying the pinnacle of an ecological habitus that seeks to behave in a manner that facilitates the environmental sustainability of human civilization. That is, because ecological agriculture is built on the epistemic foundations of impact science, its goal is sustainability and harmony with nature. Many ecological farmers understand themselves as taking direct action in response to understanding the degradative effects of the industrial agriculture system on the natural environment and human health. In response to these sins of industrial agriculture, ecological farmers could be understood as doing whatever the opposite of “climate change denialism” is.

However, this view falls too easily within a polarized narrative of American politics and agriculture. The reality is that the variations in the particular concerns of ecological farmers represents only one type of fragmentation within the logic of ecological agriculture. In addition, we must recognize that considerable fragmentation exists in the scope of ecological farmers’

resistance to the industrial system. That is, whereas some ecological farmers hold a broad and fairly radical view of societal ills, in which the environmental destruction of industrial agriculture is merely a symptom, others present a narrower and reformist perspective in which industrial farming can be tweaked to meet the needs of current and future generations. For the former group, the logic of industrial agriculture is fundamentally at odds with long-term sustainability as well as a range of social justice issues. As such, a failure of the ecological agriculture movement to completely overhaul the food system represents an existential crisis for humanity. Conversely, the latter group sees issues within the industrial agricultural system that have the potential to be reformed, tweaked, reoriented in a way that fits within a more sustainable system. For this group, significant benefits come from the industrial agricultural system. High levels of efficiency mean lots of people theoretically are able to be fed when they may not be otherwise.

For these two groups, we might consider adding additional varieties of denialism. From the perspective of the more radical group, a reformist vision of ecological agriculture denies the severity of the issues at hand. In this *severity skepticism*, even those who are theoretically committed to changing the system in a positive direction fail to do enough. On the contrary, reform-minded ecological farmers see the perspective of more radical ecological farmers as being skeptical of the benefits of modern agricultural science and technologies. In this *solutions skepticism*, an extreme commitment to radical solutions undercuts the needs for mass-level production of food and the efficiencies of scale. This fragmentation mirrors larger dynamics within the progressive pole of American politics between the fairly progressive positions represented by the likes of Bernie Sanders and Alexandria Ocasio Cortez and the more

moderate wing represented by Joe Biden and Nancy Pelosi. In both cases, individuals assert their own identity and belief system as the one that will avert the worst consequences of climate change. As with Norgaard's implicatory denialism, severity and solutions skepticism allow individuals to absolve themselves of the emotional guilt associated with climate change while protecting their own identity.

Of course, this dynamic occurs within the logic of industrial farming as well. On the one hand, some industrial farmers argue that methods like cover crops and no-till represent logical overlaps between impact and production science (if not directly in those terms). From this perspective, the conclusions of impact science can be interwoven in the practices of industrial agriculture without having to make any radical shifts. On the other hand, several farmers were particularly wary of such methods. From their perspective, utilizing cover crops and no-till to engage a more harmonious and naturalistic interaction with the natural environment represents an admission that their traditional practices are, in fact, destructive. By framing these practices within impact science, they become read as oppositional, and therefore worthy of their own opposition.

The final instance of fragmentation within the two poles of agricultural logic is the issue of certified organic agriculture. As we have already seen, a variety of industrial farmers took particular issue with the logic of ecological agriculture as expressed in organic certification. However, for many of the same reasons as industrial farmers, many ecological farmers also question the certified organic system. Several ecological farmers mentioned to me that they found the price of organic certification to be a major barrier in them getting certified. For many of these farmers, the ability to speak directly to customers and encourage them to visit their

farms provided enough legitimacy for their adherence to the logic of ecological agriculture. That is, these farmers found that going through the process of organic certification would not add value to their enterprise, as their customers already considered their products to be imbued with the value that might otherwise be legitimized with a certified organic sticker.

In addition to not adding value to their products, several ecological farmers were simply unconvinced of the ecological value of organic certification. When I asked non-organic ecological farmers what made them decide not to pursue an organic certification, several responded that they believed they were already “beyond organic.” From this perspective, the organic certification merely sets a baseline for ecological practice that many ecological farmers would easily meet in the course of their normal practice. Furthermore, several ecological farmers mentioned that they thought that the organic certification process was easy to cheat. Since they considered their own practice to be stimulated by the true values of ecological agriculture, they didn’t think they needed an organic certification.

Of course, organic farmers disagreed strongly with this perspective. When I mentioned to Karen, a certified organic farmer, that several of the other ecological farmers that I’d spoken with said that the organic certification was either too expensive or not legitimate, she shook her head vigorously. “You have to go through the process. I don’t think people should just be able to get around the specifics of doing the certification just because they don’t want to,” she said. For Karen, having gone through the cost and logistics of becoming certified organic fully legitimated her operation. Although other operations might have good practices, it would be impossible to know for sure without the certified organic label to back that up.



It is important to recognize these fragmentations within what otherwise might be considered fairly monolithic and opposing poles. As was demonstrated in the previous section, the practice of farming confers a particular worldview that is shared whether one practices within the logic of ecological or industrial agriculture. Conversely, there is considerable variation between individuals that constitute the poles of ecological and industrial agriculture. These variations are important to consider for a thorough understanding of the dynamics involved in competing institutional logics.

### 2.3.3 Summary: Overlaps and Fragmentation in the Polarization

The theoretical framework of institutional logics argues that within each major institution in society exists a dominant logic. These logics are both material and symbolic in that they both distribute real resources to people in society and provide a system of cognitive structures that make such distribution sensible to those involved. In the contemporary United States and much of the world, the dominant logic within the institution of agriculture is the industrial logic. That is, the dominant system of food production in the United States is based on a system that (among other things) prioritizes profit and production while seeking to control the vagaries of nature through technological and scientific mastery. This system has been variously lauded for providing the material basis for the explosive growth in population since the Industrial Revolution and criticized for embodying everything that is wrong with the modern world.

Partly out of the various criticisms of industrial agriculture and partly as a result of the resilience of non-industrial agricultural practices (i.e., the incompleteness of the transition to the logic of industrial agriculture), an alternative agricultural logic has arisen to challenge the

logic of industrial agriculture. Although this alternative logic goes by many names, I have chosen to title it ecological agriculture, as the practitioners of this alternative tend to focus on fitting the agricultural system within larger natural ecologies. The logic of ecological agriculture is built upon a critique of the industrial agricultural system and, as such, seeks to build an alternative model.

Institutional logics have both material and symbolic dimensions. In part one, I have discussed the ways that the logics of ecological and industrial agriculture are constituted symbolically within knowledge systems that then undergird the material practices and technologies used within each logical system. For industrial agriculture, production science represents the dominant knowledge system. The goal of production science is to maximize first profits, then yield. We saw production science made manifest in a wide variety of contexts, but the underlying legitimization is that agriculture around the world, and within the United States in particular, is responsible for feeding an exploding population and must battle against nature in order to do so. Technologies including genetically modified crop varieties, digital tools for precise knowledge of farmland and precise planting and chemical application, as well as gargantuan farm equipment all constitute technologies that exemplify production science.

Conversely, ecological agriculture is undergirded by impact science. Impact science starts with the recognition of the damages caused by industrial agriculture. Upon this basis is built an alternative agricultural system, complete with a system of knowledge and technologies. Although impact science utilizes a variety of cutting-edge scientific practices, such as soil testing and epidemiological studies showing the health effects of industrial agriculture, it leaves open the possibilities of utilizing pre-industrial or pre-modern agricultural knowledge and techniques.

In fact, many ecological farmers argued that the use of a particular agricultural technique or piece of knowledge by pre-industrial farmers demonstrated its naturalness and therefore legitimated its inclusion within the logic of ecological agriculture.

In many ways, the logics of ecological and industrial agriculture are oppositional and conflicting. Whereas the logic of ecological agriculture is built on a critique of industrial agriculture, practitioners of industrial agriculture likewise define themselves in opposition to ecological agriculture. In addition to talking about the benefits of their own practices, farmers argued that the way they farmed was better than the other way to farm. In this way, farmers were committed to a conceptualization of the agricultural field as polarized, with ecological farmers in direct and mutual conflict with industrial farmers.

Although this characterization of the dynamic between the logics of ecological and industrial agriculture is accurate, it misses a significant level of complexity. For a full understanding of the dynamics within the agricultural field, we must recognize the overlaps between the respective poles as well as the fragmentation within each. On issues such as cover crops and no-till techniques, farmers of both the industrial and ecological variety found possibilities for overlap and collaboration. In other words, through particular techniques, farmers argued that the logics of ecological and industrial agriculture could be usefully merged. However, in other areas, such as the legitimacy of organic certification and the safety of GMOs, considerable variation within each pole demonstrated that the farmers who represent each pole of agricultural logic do not constitute a monolith. Although we can think about industrial and ecological agriculture as two competing, but cohesive “logics,” we must also recognize that

they exist within the heads of the farmers that use the logics to grow food and fiber, and as such, are as variable as the farmers themselves.

## Chapter 3: Politics

Of course, anyone familiar with discussions around climate change, environmental politics, and agriculture in the United States knows that knowledge alone cannot explain the complex dynamics we have seen. Indeed, anyone paying even distant attention to the American political landscape since the 1960s would know that environmental issues have tended to divide themselves along political lines. Historically and in the contemporary moment, environmentalists and others concerned with environmental issues have tended to align themselves with the Democratic Party in the United States and with the larger progressive movement. Conversely, Republicans and the conservative movement in the United States have been critical of the impact of environmental regulations on American businesses and individual freedoms. Although there are, of course, exceptions to both sides of this characterization,<sup>24</sup> one might think of production science discussed in the first section to be generally aligned with the political right in the United States while the political left is aligned with impact science.

These characterizations go beyond agriculture, of course, but here we are concerned with their manifestations within the agricultural field. It should come as no surprise that the majority of those I refer to as industrial farmers considered themselves to be either conservative, libertarian, or Republicans, whereas most of the ecological farmers considered themselves progressives or Democrats. As the interviews for this project were conducted in the spring, summer and fall of 2020, politics were prominent in minds of many of the interviewees.

---

<sup>24</sup> Examples include the founding of the Environmental Protection Agency by Republican president Richard Nixon and failures on the part of recent Democratic administrations (both Obama and Clinton) to make meaningful progress on environmental issues.

Whether responding to the presidential race between Joe Biden and Donald Trump, the social unrest resulting from the deaths of several Black Americans at the hands of police officers, or the controversial Covid-19 restrictions, farmers had much to say about the world of American politics.

But again, we are interested specifically here in how the dynamics of the American political landscape figure into the thoughts and actions of specific Americans in actual physical landscapes. Furthermore, we are interested here in examining the ways in which the lives and experiences of farmers in Michigan shape the way they perceive politics on a local and national scale. Finally, we are interested in the ways in which the national and local political context shapes the conflict between the logics of industrial and ecological agriculture.

The structure of Part 2 will differ slightly from the structure of Part 1. As this project did not seek to witness political practices such as voting and participation in social movements, there will be no sections describing practices as there was in Part 1. Rather, in section 3.1, I will focus on the political discourse of farmers operating within the logic of industrial agriculture. For the most part, this discourse represents right-leaning perspectives, including criticisms of taxes and environmental regulation, support for traditional gender roles, and skepticism about progressive social movements. Importantly, section 3.1 will conclude with a discussion of the ways in which industrial farmers define themselves in political opposition to the progressive politics of ecological farmers. Section 3.2 will do the same for ecological farmers: describe the progressive political discourse among ecological farmers, concluding with a section on the ways in which progressive ecological farmers define themselves in opposition to the perceived conservatism among industrial farmers. Finally, section 3.3 will present a more nuanced view of

the political landscape among farmers in Michigan. As in the section on knowledge, although significant political polarization exists between ecological and industrial farmers, there is also overlap between the two poles and fragmentation within them. In fact, the streak of independence and self-reliance that is embraced by farmers across the agricultural spectrum provides substantial areas for de-polarization. However, commitments to oppositional political identities and party-led in-group vs. out-group dynamics remain significant challenges to de-escalation of political tensions in the United States.

### 3.1 Politics within the Logic of Industrial Agricultural

Industrial farmers in Michigan generally fell into the category of what is considered political conservatism in the United States. Of course, there is considerable variation within this category both among the participants of this study as well at the state and national political level. In general, however, political conservatives are known for a support of a free market economy; resistance to big government, both in the form of taxes and regulation; as well as a commitment to a fairly traditional value structure informed by various forms of Christianity. The conservative movement in the United States is represented electorally by the Republican Party.

In the course of my interviews, industrial farmers had thoughts on a variety of political topics, from extemporaneous issues including the 2020 presidential election and the various social movements sweeping the nation in the summer of 2020 to more long-standing topics like regulation, taxes, and gender. Furthermore, they saw the movement of ecological agriculture as at least partly informed by progressive politics, and therefore oppositional on the basis of

political affiliation in addition to the epistemic conflicts discussed in chapter 2. To analyze these dynamics further, I will discuss the political discourse of the conservative farmers who participated in this study before detailing their specifically oppositional character.

### 3.1.1 Conservative Political Discourse Among Industrial Farmers

Given the bevy of political issues occurring during the summer and fall of 2020, the farmers with whom I spoke had no shortage of opportunities to talk about politics. Obviously the 2020 presidential election was at the front of peoples' minds, but COVID-19, racial unrest, and plots to kidnap Michigan governor Gretchen Whitmer also made significant appearances.

In addition to these hot-button issues, many farmers also discussed long-standing conservative issues. Among farmers, resistance to regulation is a particularly important political issue. As we saw in the first section, many industrial farmers are critical of environmental regulations, and here we will discuss the particular ways regulation is understood from a political perspective. Although resistance to regulation is an important piece of the conservative politics for industrial farmers, an even more important piece is resistance to taxation. Several industrial farmers were particularly critical of Democratic Party policies that increased taxes for farmers, and they were particularly critical of the Estate Tax (more commonly known among farmers as the "Death Tax"). Finally, conservatism among the farmers with whom I spoke also manifested in social conservatism around gender and social movements. Although these issues did not relate directly to farming, many farmers found ways to connect their experiences in agriculture to these larger trends in American political life.

#### *Anti-Regulation*



The American conservative movement has long been critical of governmental regulation, particularly those relating to environmental protection. The manifestation of this resistance at the federal and state level has mostly appeared as passing bills that decrease environmental regulations and appointing anti-regulatory individuals to head regulatory bodies like the EPA and Department of the Interior. At the level of individual farmers, however, it manifests in the variety of ways that farmers talk about regulation. Farmers emphasized that regulations on farming fail to understand the nature of modern agriculture, put an undue burden on the farmers themselves, and even limit their private property rights. Of the twenty-six industrial farmers I spoke with about politics, fifteen mentioned that they were critical of the extent to which the government-imposed regulations on their livelihoods.<sup>25</sup>

As we saw in Part 1, industrial farmers find their practices to be informed by a high degree of scientific sophistication. As such, they argue that they are better positioned now than ever before to limit their negative impact on the environment. With advanced formulae for chemicals and precision application technology, farmers feel like they are the ones best equipped to make positive choices for their own land. Here, Aaron explains why he thinks regulations on chemical application go overboard:

The 'scripts I get tell me exactly how much fertilizer a piece of ground can take, so why does the government need to tell me what I can and can't do? I'm here, looking at what's going on and I have the best, newest equipment.

---

<sup>25</sup> It should be noted that the remaining 11 industrial farmers were not necessarily supportive of government regulation. Rather, government regulation was not a major point of criticism in the conversation with those farmers.

I'm going to make a lot better decision than some bureaucrat ever could about what's the right thing to do.

Aaron's perspective is that the distance of a regulator inhibits their ability to make the proper choices for his farm. By having the advanced technologies like soil testing, prescription application, and variable-rate, Aaron argues that he has a better ability to make environmentally-friendly choices than the regulators. From his perspective, he knows "the right thing to do" in terms of limiting the environmental impact of chemical application because using the tools at his disposal, he knows his land much better than any regulator could.

Aaron's perspective is part of the larger issue of farmers feeling as though they are regulated by people who are distant from agriculture and who do not understand what is required for modern farming. Another example is Jerry, who was particularly critical of new state regulations on the shipping of dairy cow manure:

So now they're telling us we can only take so much so far, and we can only do so at certain times. Well, what the hell am I supposed to do? I've got 4,000 head of dairy cows out there. That's a lot of shit! The best thing to do is to get it out onto our fields so it can fertilize the next crop, but these people just don't understand that I need to do that.

Jerry was referring to a new ordinance that limited when and how much dairy farmers are allowed to transport manure from their dairy operation to their farm's fields. In large dairy operations like Jerry's, the cows live and are milked in a central location, but Jerry's family owns and rents several dozen fields on which they grow crops to feed their cattle. This creates a

situation in which the waste from the cows is concentrated at the central location and the fertility of the fields decreases over time (an example of what Marx called the Metabolic Rift). In order to solve this problem, dairy farmers usually transport large loads of cow manure in order to spread it over their fields. The new regulation limited the capacity of each load as well as the times when dairy farmers are allowed to transport them. For Jerry, this was a prime example of “these people” in government simply not understanding the necessities of his work. Jerry and Aaron were not alone in their sense that government regulators misunderstand the exigencies of modern farming. Of the fifteen industrial farmers who were critical of regulation, six said they found the regulations to be out of touch with modern farming.

In addition to feeling that the individuals responsible for imposing regulations were out of touch with modern farming, many farmers also thought that government regulations put an undue burden on farmers. In order to comply with regulations, farmers thought that they were being forced to operate in a way that undermined their ultimate goals of production and profit maximization. When I asked Larry his take on agricultural politics, he had this to say:

The government just wants their hands in everything, you know. That’s what drives me crazy. Being a farmer isn’t easy already. How am I supposed to make money when all they want to do is tell me what I can’t do?

For Larry, the slim profit margins that already exist in farming are made even more slim by the regulations that are imposed on his practices. According to Larry, if he was simply allowed to do what he wanted, he would be much more profitable. Four of the industrial farmers who said

they were concerned about regulation were particularly concerned about the undue burden it placed on farmers.

Taking this perspective further, many farmers thought that environmental regulations on farmers simply represented an over-extension of government power into their private property rights. For seven out of the fifteen industrial farmers that mentioned that they were concerned about regulations, the main issue was that the government should not have a right to impose on what they could do on their own property. Dave was particularly strong on this point:

If you're going to say that I need to only apply this much fertilizer or this much pesticide, ok. But what exactly gives you the right to tell me that? You're going to tell me what I can do on my own property? I own that land or rent it from someone else. How can you tell me what I can and can't do on it? If I destroy it, that's on me not you.

From this perspective, the legal ownership or leasing of a piece of property should designate an individual the right to behave as they will. Under this arrangement, the responsibility for the health of a piece of land is up to the person farming it, and the consequences are theirs as well. Importantly, Dave went on to note that with this responsibility, he believed farmers would act in an environmentally sustainable way because it makes sense economically. From Dave's perspective, regulations remove the responsibility for taking care of a piece of land from the farmer who uses it.

Other farmers presented a more moderate take on this particular stance. For example, Mark recognized the impact that his practices had on others, while remaining critical of the government's imposition, saying:

Look, I get that what I do on a field of mine can affect other people. Like with this Dicamba stuff. I don't want to spray my field and it drifts and ruins my neighbor's crop. But he and I can handle that, right? I can go to him and ask him what he's got planted like I've been doing for years... I just don't see any need for the government to then try to tell me what he and I can do on our own fields.

Here, Mark recognizes the impact that his actions can have on the people around him. He understands that the things he does on his own property can have deleterious effects on those who live and work in the proximate area. From his perspective, however, those effects can be mitigated by one-on-one relationships between neighbors.

Interestingly, although Mark did mention the health effects of chemicals at other points in our interview, at this point, he chose to use a neighboring farmer as an example, rather than a neighboring home or school. Using the possibility for Dicamba to drift as an example, Mark recognized that his chemicals might have a deleterious effect on another farmer's profitability. Although this example doesn't exclude the possibility of working with neighbors to limit the health impacts of agricultural production, it does demonstrate that for conservatives, it can be easier to limit the discussion to the economic realm. Spraying Dicamba next to a field without Dicamba resistance can clearly hurt another farmer's profitability. It would be interesting to see

how Mark would react, for example, in the case of a neighboring mother asking him to limit his use of glyphosate during a pregnancy.<sup>26</sup>

One particular issue combined all three of the issues discussed above. In 2015, the Obama administration imposed new restrictions in the Waters of the United States (WOTUS) regulation, which affected farmers in particular. Of the fifteen industrial farmers who were concerned about regulations, five mentioned WOTUS as a major example of ignorant bureaucrats imposing undue burden on farmers in a way that restricted their private property rights. According to Todd, one of the major accomplishments of the Trump administration was pulling back the WOTUS restrictions:

I was pretty critical of Obama for a lot of things but WOTUS had to be about the worst thing he did, especially for farmers. There's a puddle on my farm, and he said that it was a navigable waterway. Are you kidding me? These people that have no idea what they're talking about are going to ruin farmers. There's just no way to make it when they're telling you what you can do, and they have no idea what's going on.

According to Todd and the four other industrial farmers who mentioned the WOTUS regulations, the rules demonstrated the ignorance of the Obama administration. Although they recognized that there was an attempt in WOTUS to ensure clean water, they thought that the rules extended beyond the realm of common sense. For Todd, a recurring "puddle" became a

---

<sup>26</sup> This example plays intentionally on concepts of gender and variations in concern for different types of people. Would Mark be more convinced to limit his use of glyphosate (which has been linked to higher rates of autism symptoms (Pu et al. 2020)) by an expecting mother as opposed to a long-haired young man such as myself? This would be an exciting future research project.

navigable waterway under the new rules, meaning it became subject to new restrictions. From Todd's perspective, these new restrictions put his farm at risk by restricting his ability to practice in the way he sees fit. In addition to agreeing with Todd that WOTUS regulations were unnecessary and over-burdensome, Dave later mentioned that he thought it was "all about power." Given what he saw to be an illogical regulation that placed burdens on what farmers do on their own property, Dave thought the only reason for such practices were to expand government power.

For industrial farmers, government regulations on farming practices reinforce their feelings of being outsiders. Whereas the politicians who impose regulations on agricultural practices are perceived to work and live in urban areas, the farmers themselves feel the squeeze when what they are allowed to do is limited. From their perspective, the environmental impacts of what they do would be best solved by conversations between neighbors, not by regulations imposed from on high. When such regulations are imposed, it clashes with a sense of independence and self-reliance that many farmers had. Not only do regulations limit what farmers can do on what they see as land that belongs to them, they also suggest that the government knows better than farmers what they should do on that land. This combination leads to industrial farmers feeling a general opposition to environmental regulations.

### *Anti-Taxes*

A similar dynamic exists among industrial farmers in regard to taxation. Of course, resistance to taxes is a long-standing conservative position, and is likewise associated with a distrust of the

ability for the government to make good decisions with taxpayer dollars. This distrust of the government sometimes manifests in the argument that the farmers themselves would be more able to be beneficial for their community than the government is if they paid less in taxes. An alternative perspective shared by the conservative farmers in this study was a criticism of specific things for which the government uses tax dollars, including roads (a notorious issue in Michigan), and welfare. Finally, the conservative farmers in this study were critical of an Obama administration proposal to increase the estate tax. Called the “Death Tax” by many conservative commentators, this was a particular concern for many farmers, given the asset-rich but cash-poor nature of relatively large farms that are often passed down generationally. Overall, conservative farmers found the taxes they paid to be unfair, argued against their payment and enforcement, and occasionally discussed ways to get around them.

Of the twenty-five industrial farmers I interviewed for this project, twelve argued against taxation in the course of discussing political issues. Of these twelve, nine were generally dissatisfied with the ways that the government spends tax dollars. While these nine discussed their dissatisfaction in various ways, the general sense was that if they had been allowed to keep the money that the government takes in taxes, they would spend the money in a better manner than the government did. Gary made his position the topic very clear:

If the government just let me have the money they take from me in taxes, I think the world would be a lot better. Maybe I hire another guy and give him a job. Maybe I spend a little more, but that gives other people jobs, right? Or... I give a lot of money to charity. But let me choose the charity. If I want to give money away to people, let me pick who gets my money.



Gary's argument mirrors the criticisms we saw of environmental regulations in that he finds that the government's distance prevents it from functioning efficiently. The money required to fund the government would be better spent, according to Gary, by the person that earned it (i.e., himself). Interestingly, the first two fall firmly within a capitalist mode of production; the money he pays in taxes could go toward paying additional employees<sup>27</sup> or toward consumer spending. After pausing, he also added that some of the money he pays in taxes could go toward charities that he thinks are worthy, rather than the evidently unworthy causes that the government spends it on.

Among the unworthy causes that the government uses taxpayer money for is building roads. Despite being the home of the Motor City and relying heavily on the automotive industry, the crumbling transportation infrastructure in Michigan is a common topic of conversation. At least in part due to weather patterns that make maintaining roads a constant challenge, Michigan's crumbling transportation infrastructure is also often blamed on whichever political party happens to be in power, or whatever political force suits a given narrative (e.g., lack of funding due to tax cuts or government inefficiency). Of course, industrial farmers depend heavily on state roads both to access fields that are often miles apart and to transport harvested products to buyers that are sometimes hours away by truck.<sup>28</sup> Partly for this reason, they are particularly critical of the condition of these roads.

---

<sup>27</sup> In Gary's comment we also see the tendency toward assuming the masculine when discussing farmers and farm workers.

<sup>28</sup> Depending on local conditions, different grain buyers will sometimes pay premiums which can make it profitable to ship several truckloads of corn on one occasion to Toledo, then fill those trucks with soybeans and send them to the Ithaca plant in northern Michigan.

Of the fifteen farmers who were critical of taxation, three mentioned the roads as reasons they were reluctant to pay taxes. Here, Linda connects her criticism of Michigan's crumbling infrastructure to taxation policies:

Just look at the roads out there! They're terrible! How many times have the people in Lansing said they were going to fix the roads, raised taxes, and look where we still are.

For Linda, having experienced several rounds of politicians saying they will fix roads only to continue living with potholes makes a tax bill hard to swallow. Perhaps the most obvious of the types of things that taxes are supposed to pay for, Michigan's roads are an example for industrial farmers of government inefficiency.

If roads are an obvious and ever-present example for industrial farmers of the failures of government, welfare represents an unseen danger. For the two industrial farmers who mentioned welfare as a reason they were critical of taxes, the recipients of such payments were almost universally seen as distant, urban, and unworthy. Dan laid this argument out most strongly:

I wouldn't mind paying taxes if I knew it was going toward. The thing is, I know it's going to some welfare recipients down in Detroit who's never gotten off their ass a day in their life. No thanks. I'd prefer to keep my money.

On the surface, Dan's perspective represents resistance to providing payments to distant and urban populations whom he perceives as lazy. Of course, given the racial history of the city of Detroit as well as long-held stereotypes, it is difficult to not see Dan's comments here as a

thinly-veiled racist attack. Although I am certain that Dan would say that he would apply this criticism as much to white welfare recipients as black recipients, it is difficult to imagine that race has nothing to do with this perspective. Of course, this perspective also ignores the historical *disinvestment* in vulnerable populations around the country and particularly those in urban Detroit. Clearly though, feelings of disgust for unworthy welfare recipients were a major part of Dan's politics. Resistance to taxes for Dan is resistance to "his money" going to "those people."

In addition to being critical of the ways the government spends tax dollars, farmers were also critical of the reasons they get taxed. In particular, three conservative farmers were critical of the 2015 decision by the Obama administration to push for an increase in the estate tax, which taxes inheritance from one generation to another upon death. Although proponents of the increase argued that the bill only increased taxes on the very wealthy, farmers were concerned about the impact on family farms. Industrial farms are inherently asset-heavy, given the requirement for large equipment and vast acreage of land. Relative to their assets, however, many farmers have relatively low liquidity, as they only get paid in cash when they sell their harvested crops. As such, many farmers were concerned the so-called "Death Tax" was going to be harmful for their businesses long term. Randy was one of the three conservative farmers who brought this issue up:

The Death Tax would've been terrible for farmers. It's already bad enough, and Obama wanted to increase it. If my family built this farm, why shouldn't I get to keep running it? I'm not waiting around for my dad to pass, of course,

but when he goes, how terrible is it that I'm then going to have to sell a bunch of stuff just to keep this place?

For Randy, on top of the illegitimacy of the government's use of taxes, he is also frustrated by the specific reasons he gets taxed as a farmer. Although it may look like he has a lot of money on paper (in assets), he feels like he's barely scraping a living out of farming. Furthermore, when older generations pass away, tragedy is compounded by a business-threatening tax bill. As such, the "Death Tax" is seen by conservative farmers as yet another instance of government action harming the modern farmer.

Whether these farmers thought the government was *intentionally* harming farmers through taxation varied among those who mentioned taxes. As we saw with Dave's comments, some conservative farmers took the position that the government is inherently interested in expanding its own power. As such, regulations and taxes represent an intentional expansion of government power at the expense of farmers. For others, taxes and regulations that are seen as illogical and ultimately harmful to farmers are the result of politicians that are ignorant of the lives of farmers. Given their different lifestyles and perceived and actual distance from the centers of power, farmers feel they are misunderstood by those politicians (particularly Democrats) imposing taxes and regulations upon them. Furthermore, taxes are perceived as being unrightfully taken from them in order to be used for undeserving purposes like inefficient road maintenance and unworthy welfare recipients. On the whole, these positions place the industrial farmers firmly on the side of the modern Republican Party.

*Traditional Gender Roles*

Of course, the modern Republican Party's position on taxes and regulation are only part of the larger constellation of topics that make up the political right in the United States. Social issues likewise make up an important part of the conservative movement. When these came up in my discussions with farmers, the most common topic was gender roles. Of the twenty-five industrial farmers interviewed for this study, only eight were women. Of the eight women, only four were actively engaged in production agriculture, whereas the others worked in white collar jobs related to agriculture. The lack of gender diversity in my sample mirrors the dominance of men in the industry overall (USDA 2017).

The dominance of men in industrial agriculture was understood as a given for the farmers in this study. The dominance of men was so taken for granted among farmers that they almost universally referred to other farmers as "guys." By my count, of the eighteen male industrial farmers in this study, fifteen referred to other farmers using male pronouns. This phenomenon manifested when talking about various practices, such as when Bill said, "Some guys are really excited about no-till." It also happened when referring to farmers in general, such as when Derrick said, "If you need to know how to fix something, ask a farmer. He'll either know or know a guy who does."

The prevalence of male pronouns when referring to fellow farmers reflects the prevalence of men who farm. There are of course, women farmers, but the fact that they are referred to in such a way marks them as unique. In other words, to be a "woman farmer" is to be different from being just a "farmer," at least among the industrial farmers with whom I spoke. Furthermore, the term "guys" is commonly used in Michigan and other parts of the Midwest as a (theoretically) gender-neutral, second-person plural pronoun. "You guys" will

often be used in a similar way to “y’all” in the South to refer to groups of people, regardless of gender. However, the use of “you guys” to refer to women or mixed-gender groups reveals that the male is the taken-for-granted category. It is both a result of stratification by gender (i.e., legal and social understandings of gender-based inheritance structures that benefit sons over daughters) as well as a reinforcement of such stratification, as it subtly reminds speakers and listeners of such language of the expected maleness of personhood and farmerhood.

The women who were involved in industrial farming had fascinating things to say about the gender dynamics in the field. All four of the women who worked directly as farmers said they tried as hard as possible to limit the extent to which gender influenced the way they farmed and the way they were perceived as farmers. Furthermore, Jennifer, who works in an agriculture-related white-collar field mentioned that she enjoyed working with farmers because of their traditional values around gender.

When I go to a meeting with farmers, I never touch my own chair. Someone always pulls it out for me. It’s those kinds of things that you don’t see a lot with other groups nowadays. But with farmers, they haven’t forgotten those old ways.

For the women who tried to limit the extent to which gender influenced their work as well as Jennifer, the dominance of men in agriculture did not represent a problem. As we will see in the section on ecological farming, a much larger portion of ecological farmers are women, and they often see the dominance of men in industrial agriculture as a major part of the problem. For the conservative women involved in industrial agriculture, however, the traditional gender roles

that are commonplace among industrial farmers either represented a distraction to be minimized or an advantage to be capitalized upon.

### *Summary of Long-Standing Conservative Discourse Among Industrial Farmers*

The industrial farmers in this study tended to embrace long-standing conservative positions on issues including resistance to regulations and taxes as well as traditional gender roles. Among the twenty-five industrial farmers in this study, fifteen were particularly critical of the regulations imposed upon their agricultural practices. Furthermore, twelve found the taxes imposed upon them to be unfair, whether because they found the use of tax dollars by the government to be undeserving or because they questioned the legitimacy of the reasons why they were taxed. Overall, resistance to taxes and regulation was at least partly inspired by a distrust of government and a feeling of distance and difference from those passing such laws.

The feelings of these industrial farmers on gender subtly reinforced these feelings. As with so much in today's political landscape, opposition to particular ideas is as important as support for others. In the case of gender roles, it seems as important that farmers are going against the flow in respecting tradition as opposed to the specifics of traditional gender roles themselves. At least for industrial farmers, traditional gender roles are embraced both because they are seen as natural and because they reinforce their conceptions of their own uniqueness. As we will see in the next section, these long-standing conservative positions on various political topics were both reinforced and slightly altered in the context of hot-button political issues.

### *Hot-Button Conservative Discourse Among Industrial Farmers*

The summer and fall of 2020 had no shortage of hot-button political issues. From the COVID-19 pandemic and subsequent restrictions to racial unrest and a major presidential election, the farmers who took part in this study had plenty to discuss. In this chapter, I will discuss those political topics on which the industrial farmers in this study took a positive position. In the next chapter, I will discuss the instances in which industrial farmers took an oppositional position on contemporary political issues.

As is the case in many places, election time in Michigan meant political signs galore, littering lawns, roadsides, and bumpers across the state. In my travels around the state of Michigan in the summer and fall of 2020, I drove past thousands of signs from “Keep America Great” to “Biden-Harris 2020.” Of course, signage supportive of then-candidate Biden was most prevalent in urban areas, although I did see a significant number of them in the rural countryside. Conversely, signage supportive of President Trump was highly visible in rural areas while being virtually nonexistent in urban centers. In addition to signs for the national presidential election, a host of local races was also common, including those for John James, a Republican military veteran who lost a bid to unseat Democrat Gary Peters for one of Michigan’s U.S. Senate seats.

Partly in order to avoid cornering participants into defending particular politicians, I tried to ask farmers about particular issues relating to their political beliefs and opinions. The most common question I asked industrial farmers was how they felt about the way that Trump handled the trade war with China. In response to trade restrictions placed on China by the Trump administration, Chinese officials limited imports of American agricultural goods. As a result, the Trump administration directed the USDA to send direct payments to American



farmers. Critics argued that Trump was “buying votes” by sending money directly to a demographic that tends to side with Republicans. For the industrial farmers in this study, the payments to farmers represented a reasonable response. For example, Dave thought that putting pressure on China was necessary, but that American farmers needed to be protected:

Look, I'd much rather get that check from the grain elevator than the government. But China doesn't play by the rules, and it's about time someone does something about it. Farmers are the ones who've paid the price for that, and I think these payments are just Trump recognizing that.

Dave's perception was that Trump's decision to stand up to China made the sacrifice of farmers like him worth it. Furthermore, although Dave makes it clear that he does not prefer to take payments directly from the government, he recognizes their necessity in the context of the trade war. In this way, the perception of being left behind and forgotten by far away politicians is flipped on its head. Whereas many industrial farmers thought that politicians place undue burden on farmers, they thought that the Trump administration recognized their importance as well as their sacrifice in the situation with China.

This trend extended beyond the immediate context of the trade war with China. Although I often tried to avoid asking questions about any particular political candidates, two of the farmers I talked to explicitly mentioned their support for Trump. Thomas, a third-generation specialty crop farmer said he appreciated the way Trump talked about farmer:

He just gets it, man. He knows how important farmers are to this country and he doesn't just talk about it like other politicians. He backs it up. I love the way he talks about farmers. It feels like he gets us.

The difference in the way that Donald Trump speaks in relation to other politicians has been discussed at length. For Thomas, the way that Trump speaks about farmers emphasizes the differences between him and other politicians. In addition to his manner of speech, Thomas also thought that Trump's language was backed up by explicit action. Whether this was in reference to the direct payments to farmers in response to the trade war with China, the decrease in regulations on farmers, or a host of other issues, Thomas felt seen and heard by Trump in a way that he had not by other politicians.

### 3.1.2 Industrial Farmers' Views of Progressive Politics

If there is a defining factor in the political landscape of 2020, it is its oppositional nature. All but two of the industrial farmers considered themselves conservatives or Republicans. However, there were relatively few instances of farmers discussing positive support for politicians or policies. Rather, farmers expressed there a host of oppositional perspectives. One group that the industrial farmers seemed to have particular animus toward was the Democratic Party. In particular, Michigan Governor Gretchen Whitmer, presidential candidate and eventual President Joe Biden, as well as former presidential candidate Hilary Clinton and Speaker of the House Nancy Pelosi were all mentioned critically by industrial farmers. Furthermore, many industrial farmers were critical of progressive social movements, particularly those around race and gender. These movements as well as progressive politics in general were occasionally

lumped under the banner of socialism and thereby excoriated. Finally, specific criticism was held for what many farmers understood to be over-zealous restrictions in response to COVID-19. Although these topics often went astray from the topic of agriculture specifically, the industrial farmers in this study often found ways to link current events to their own farming practice.

### *Democrats*

When conservative farmers talked about their resistance to environmental regulations and taxes as discussed in the first chapter of this section, they often placed particular blame for these policies on Democratic politicians. If farmers perceived politicians in general to be distant and ignorant of their lives, Democratic politicians were perceived as particularly so. Given the high-profile nature of the presidential election, Joe Biden was a particular target. Likewise, national figures from the Democratic Party including Barack Obama, Nancy Pelosi, and Hilary Clinton were frequently criticized by industrial farmers. Finally, Gretchen Whitmer was also criticized by several of the industrial farmers in this study. Although her response to COVID-19 was thoroughly criticized and will be addressed in a subsequent section, some industrial farmers found her connection to the larger Democratic Party apparatus to be problematic in its own right.

Opposition to then-candidate Joe Biden among the industrial farmers in this study came in two forms. Both perspectives essentially argue that although Biden himself may not offer a significant threat, his ascendancy to the presidency is nevertheless perilous for American society. On the one hand, three of the twenty-five industrial farmers argued that it was clear

that Biden was suffering from significant cognitive decline. Erica was particularly strong on this point:

It doesn't seem like Biden is all that bad of a guy, but my grandma had Alzheimer's and I just don't know how anyone doesn't see it in him. I've seen so many clips online that... he's just not all there. And he's going to be in charge of trade? He's going to stand up to China? They'll eat him up.

Erica's experience with dementia in her family along with clips she saw online led her to believe that Biden would not be fit for the job of president. In addition, she connected this fear directly to the issue we discussed in the previous section: standing up to China. Whereas Trump has positioned himself as "tough on China," Erica argued that Biden's mental capacity would not be strong enough to handle China effectively. Although Erica did not refer directly to Trump in a positive manner, her use of the term "stand up to China" seems to refer to Trump. For industrial farmers, Biden's ability to stand up to China is important because of the effect that China can have on global grain prices. From Erica's perspective, if Biden gets "eaten up" on the global stage, consequences could hit farmers' pocketbooks.



Figure 2: My Governor Sign

In addition to national figures, Michigan Governor Gretchen Whitmer was mentioned by four of the industrial farmers in this study. Whitmer won the gubernatorial race in 2018 after Donald Trump took the state in the 2016 presidential election. Rising to prominence after strong lockdown measures in response to the COVID-19 pandemic and criticizing the response of the Trump administration, Whitmer became a national figure in the course of 2020. In apparent response to this, a particularly common sign I saw around Michigan can be seen above. In bold letters, the sign reads “MY GOVERNOR IS AN IDIOT,” with a cartoon picture of Whitmer in the O of “idiot” with a slash across it. Satirizing the font of Michigan’s tourism slogan “Pure Michigan,” the bottom of the sign reads “Pure Moron.”

As we will see in the section on ecological farmers, harsh criticism of politicians was not limited to industrial farmers or the political right. Donald Trump, Mitch McConnell and a variety of prominent Democratic leaders figured prominently in the criticisms made by ecological farmers who generally leaned to the left. What we've seen here, though, is that in their association with what is considered the oppositional party, Democratic leaders were targets of attacks from the conservative farmers in this study, who often related their criticisms to their identities as farmers.

### *Resistance to Progressive Social Movements*

If prominent members of the Democratic Party were singled out for the ire of conservative industrial farmers, progressive social movements were a more generalized symbol of opposition. Whereas individuals involved in the Democratic Party were targets of criticism for some conservative farmers, the specific ideas and causes supported by various progressive social movements were at issue for others. Of particular note was criticism of the racial unrest happening in the summer of 2020, usually identified as the Black Lives Matter (BLM) movement. In addition, movements supporting rights and recognition for transgender individuals were also criticized on a couple of occasions.<sup>29</sup> Finally, several of the participants grouped the policies of the Democratic Party and the general push of the political left in the United States under the banner of socialism. With this single word, these conservative farmers

---

<sup>29</sup> All 26 industrial farmers were white, and I am only aware of one that identified as a member of the LGBTQIA+ community.

considered the point proven. That is, the conservative participants of this study thought that by designating these movements as socialist, they were consequently discredited.

The summer of 2020 brought the most significant racial unrest in the United States at least since the 2014 killing of Michael Brown and probably since the unrest of the 1960s. After the death of George Floyd at the hands of Minneapolis police officer Derek Chauvin, the death of Breonna Taylor after Louisville police entered her apartment accidentally, as well as a seemingly unending list of people of color dying at the hands of police in the United States, millions of people across the country took to the streets. Although the injustice of Floyd's death was initially agreed upon across party lines, many conservatives quickly chose to focus on the damage caused in the course of the unrest that erupted over the next several months.

Of the twenty-five industrial farmers, seven brought up the unrest in response to the killing of George Floyd. All seven referred to "riots" and criticized protestors for causing property damage and disrupting people's lives by using protest tactics including stopping traffic and looting stores. All the farmers who brought up this issue were white, conservative men. Interestingly, however, the age range was wide, with four of the seven falling into the forty-five-plus category and three in the below-forty-five category. All seven of these farmers said they understood the anger on the part of the protestors but found the disruptive and destructive tactics to be problematic and counterproductive. For example, Dave had the following to say:

I get that people are mad. When I saw that video, I was mad. But what they're doing now, I just can't condone. Going into Targets and stealing stuff and

burning stuff? How does that make anything better? It doesn't. It makes it worse.

From Dave's perspective, the anger represented among the protestors in the BLM is justified, but the subsequent behavior is not. Interestingly, five of the seven farmers who were critical of the unrest in the summer of 2020 specifically brought up the video of George Floyd's murder. As in Dave's case, it seems that for many the video of Floyd's death marks a particular instance of police misconduct and injustice. The video served as proof to these farmers of the injustice perpetuated on May 25, 2020, against George Floyd. What it does not prove is the more systemic nature of the injustices perpetuated by police against people of color in the United States. As such, the disruptive tactics and behavior of the BLM movement are seen as extreme and unjustified.

Because the tactics of the BLM movement are seen as unjustified, the protestors themselves become depersonalized. As such, extreme and violent responses by government officials, including President Trump, were seen as reasonable. For example, Thomas told me he agreed with President Trump that, "when the looting starts, the shooting starts." In fact, Thomas told me that partly as a result of the pandemic and partly as a result of the "riots," he had bulked up his supply of weapons:

This may not be politically correct to say but I bought two new AR-15s after all this shit and as much ammo as I could get my hands on... I'd like to see someone try to come down my driveway and start breaking stuff.



The violence implicit in such threats did not seem to faze those who shared them. Two of the other farmers who were critical of the BLM movement also mentioned that they had purchased weapons in response. Of course, such purchases were part of a larger uptick in gun ownership in 2020 that can be attributed as much to the pandemic as to protest movements. Nevertheless, such assertions on the part of these farmers were part of a larger conservative identity that resists such social movements and supports personal gun ownership.

In addition to such sweeping condemnations of the movement for racial equality, some farmers took issue with feminism. Only two industrial farmers mentioned feminism specifically, but as we have seen, many others voiced general support for traditional gender roles. For those opposed to feminism in particular, it was once again part of a general lumping together of progressive issues. For example, Alex, a young industrial farmer, had this to say:

I'm not opposed to women doing whatever they want to do but I just think feminism has taken it too far. These liberals are trying to tell women that they shouldn't value their motherhood or take pride in the things that make them women and I think that's wrong. Men and women are gifts from God and we should appreciate that.

Alex's thoughts on feminism both lumps it together with broader "liberals" and condemns it by virtue of God's will. Alex values the things that define womanhood for him, including motherhood. For him, feminism represents the denigration of the things that God has used to define women (and men) in a positive way. By lumping feminism together with other things that liberals do, Alex criticizes both feminism and liberalism. On the one hand, liberalism is

disparaged by its relation to a perspective that denigrates the God-defined (and therefore inherently good) aspects of binary gender classifications. On the other hand, feminism is corrupted by its association with the larger liberal movement that includes national-level Democratic Party leaders that are particularly disliked by conservatives.

None of the women involved in industrial farming brought up feminism. The closest that any of them came was when Jennifer talked about appreciating the traditional values concerning gender of the farming men with whom she works. Although Jennifer seemed to implicitly criticize the contribution of feminism to a societal move away from traditional gender values, she did not invoke feminism itself. Additionally, both Cassy and Linda mentioned that they thought that women were more included in modern agriculture than they had been in the past. Although these comments seemed to indicate that Cassy and Linda found these developments to be positive in nature, they also did not refer to concepts such as feminism directly. Given the explicit criticisms of feminism by other industrial farmers, we may speculate that the term itself has become untouchable. That is, although Linda and Cassy may support such tenets of feminism as equal treatment in the workplace, they may not wish to evoke the term itself for fear of reprisal.

If feminism and Black Lives Matter represented issues conservative farmers were critical of, an element lurking somewhat in the background was socialism. As we have seen, progressive social movements including BLM and feminism were singled out for criticism but were also criticized as part of the larger movement of the political left in the United States. For some farmers, the issue with progressive movements, particularly those supported by the Democratic Party is their relationship to socialism. Although support for socialism is varied

among progressive activists and Democratic Party leaders, five of the industrial farmers thought that the political left in the United States was united in its support for socialism. For example, when I asked Bill how he felt federal farm policies affected farmers, he had this to say:

Oh, they want to control everything we do... You know the socialists are taking over. Look at what Obama did. Look at what Hillary wanted to do. Look at these so-called activists and whoever else. They want this country to be socialist and... they're going to kill us.

Bill was vague regarding the specifics of what President Obama, Secretary Clinton, and the “so-called activists” have done to convince him that they support socialism. What we see in this quote, however, is his certainty both that they are “taking over,” and that they will “kill us.” Of course, it is also worth mentioning that Bill’s response did not really answer my question. When I asked about federal farm policies, his focus leaped to the control that he feels the federal government seeks to have over farmers and the relation of such control to socialism. Because it was so obvious to Bill that socialism would have negative consequences (although it is unclear by what method Bill thought the socialists would “kill us”), Democrat and activist leaders became othered through their supposed support for socialism.

Criticisms against the BLM movement, feminism, and socialism were not as common among industrial farmers as criticisms of regulations or taxes were. However, progressive social movements were brought up by the farmers themselves, whereas I specifically asked them about regulations and taxes came up frequently when I asked about government involvement in agriculture. This may suggest that resistance to progressive social movements have become a

significant part of conservative political identity for at least some industrial farmers. For these farmers, such concepts as feminism, BLM, and socialism are grouped under a unified political identity that is fundamentally at odds with their own.

### *Summary of Politics within the Logic of Industrial Agriculture*

Many of the conservative industrial farmers who participated in this study supported both long-standing and hot-button conservative political positions. Support for traditional gender roles, Donald Trump, and other Republican politicians are manifestations of the things conservative farmers stand for. Even resistance to regulations and taxes are indicative of a positive identity. These farmers argued that they could make decisions with their own land and money better than the government could, and therefore they are resistant to such impositions.

Conversely, many of the industrial farmers in this study defined their political identity *in opposition* to the positions held by others. That is, the conservatism demonstrated by the industrial farmers with whom I spoke was defined both by an allegiance for certain ideas (self-reliance, particular politicians, etc.) and by an opposition to particular other groups and their ideas. In particular, big-name Democratic politicians were singled out on a variety of occasions for excoriation. Such individuals were seen as power-hungry and interested in involving themselves in the lives of farmers while remaining ignorant of agricultural lifestyles.

In addition, the particular events that occurred in 2020 led to several farmers indicting specific social movements as oppositional to themselves. BLM, feminism, and other broad swathes of the political left in the United States were grouped under the banner of socialism, and thereby shown to be without merit. Although more industrial farmers brought up issues

they supported, the individuals who brought up their opposition to progressive politics were almost universally more emphatic. In this case, arguments *against* other groups or ideas were expressed more forcefully than arguments *for* one's own group.

As we will see in the concluding chapter of this section, however, not all industrial farmers manifested such powerful oppositional political identities. Many recognized the humanity in those with whom they disagreed. However, for those who discussed their opposition to progressive politics, political opponents often became depersonalized.

### 3.2 Politics within Ecological Agricultural Logics

Whereas only two industrial farmers identified as Democrats, there was a considerable variation among ecological farmers in terms of political affiliation. Although none identified explicitly as Republican, two were proud Trump supporters and several others said they preferred the term libertarian. Almost all were critical of federal support for industrial agriculture, many saying that large farmers receive welfare from the government in the form of crop insurance and other subsidies. On the whole, ecological farmers were more eager to discuss politics relative to their industrial farming counterparts and were also more likely to discuss the ways in which their politics informed their agricultural practices. Finally, as in the case of impact science, much of the progressive politics discussed by ecological farmers was explicitly motivated by a criticism of industrial agriculture.

#### 3.2.1 Political Discourse Among Ecological Farmers

For many of the ecological farmers who took part in this project, politics are a central part of their identity. For these farmers, choosing to farm in an ecological manner is an act of political

rebellion against a status quo that prioritizes the production and profits of industrial agriculture. The particular form such politics take, however, range quite widely. For some ecological farmers, issues of justice motivate their action. The concept of food justice was discussed at length by several ecological farmers. For others, the industrial agriculture system makes the United States overly reliant on foreign countries. As such, these farmers argue that ecological farming is an act of shoring up domestic food security through a more decentralized food and agriculture system. Finally, in contrast to the traditional gender roles encouraged by some industrial farmers, feminism plays a significant role in the lives of many of the ecological farmers who participated in this study. For them, becoming involved in ecological farming is part of asserting a broader conception of gender in the provision of sustenance for their families and community members.

In addition, many ecological farmers had much to say about the hot-button issues occurring during the interviews. Although two of the ecological farmers told me they supported President Trump, most were highly critical of his policies, demeanor, and rhetoric. Several brought up ways that their farms were connected with organizations fighting for social justice, including the BLM movement. In this way, ecological farmers responded to political issues that are both long-standing and had particular manifestations at the time of the interviews.

### *Food Justice*

For many of the ecological farmers interviewed for this project, food justice was a major motivation. Of the twenty-five ecological farmers interviewed, eighteen mentioned concepts related to social justice as a motivating factor for their practice. To these farmers, providing

sustenance for one's neighbors is a constitutive part of living in community, in addition to an opportunity to make a living as a farmer.

As we discussed in Part 1, many ecological farmers were concerned that the industrial farming system fails to provide healthy food to the citizens of the United States and the world, particularly for the most vulnerable populations. The attempt to ameliorate such issues can be understood as the fight for food justice. Rather than fighting such a battle on a global scale in the manner of industrial agriculture, ecological farmers choose to seek to ameliorate food injustice in a particular local area. For example, when I talked to Jessica, she told me that the most rewarding part of farming in Detroit was seeing her neighbors eating the food she grew:

There aren't any grocery stores near here. When I see the folks around the block in their backyards cooking up some of the peppers I grew in my garden, I feel like I'm actually doing something, you know?

For Jessica, the value of contributing to the alleviation of food insecurity in her neighborhood is major motivation to continue farming. Although she later told me that selling products in high-end farmers markets paid most of her bills, her contribution to food justice within her own community remained important.

For others like Jessica, food justice is an explicitly racial issue. For Sandra, farming has allowed her to provide food for her community after it felt abandoned by the city of Detroit:

Everyone just left us here. White flight and all that... the stores are gone, jobs are gone, all that's gone but we're still here. And these people have to eat,

too! I like to think that some of what I'm doing here is filling some of that hole.

Like Jessica, Sandra's sense of filling the hole left by white flight and the downturn in the local economy drives her to continue farming. Of course, the consequences of white flight and Detroit's downturn fell disproportionately on communities of color, but farmers like Sandra find resilience in farming. Sandra's political involvement does not end at farming, however. She also told me that she is active in a variety of community organizations in her area. For Sandra and Jessica, contributing to food justice in their local communities is part of a larger activist lifestyle.

Not all of the ecological farmers were explicitly motivated by political activism. For others, the drive for personal health was a stronger motivating factor. Farmers like James saw ecological farming as an opportunity to provide him and his family with healthy food while doing work he enjoyed in order to make a living. Even for Paul, though, donating food to local charitable organizations was an important part of feeling good about his lifestyle:

I love doing this. I love the feeling of biting into a tomato that I grew. But this place has to be profitable in order for me to continue doing it. I try to prioritize donations of our products to the local [charitable organizations], but that's got to be weighed against our profitability... But yeah, it's really important to do those sorts of things.

For James, food justice was not a major factor for starting a farm. However, contributing to food security remains an important value that he balances against the profitability of his operation.



We can think of these examples of ecological farmers contributing to the food justice in their local communities as part of a progressive agricultural politics. Whereas the conservative politics discussed in the previous chapter prioritized the maximization of individual rights, only limited when members of the community were harmed in some way by a farmer's actions, the logic of ecological agriculture here prioritizes the health of the community itself. Although we see both Sandra and James balancing their own profits with the needs of the community, the latter remains an important value.

### *Domestic Food Security*

In a slightly different approach to the issue of food justice among ecological farmers, some of the more conservative-minded ecological farmers argued that their work contributed to the domestic food security of the United States by creating a decentralized food system. For these farmers (six out of the twenty-five ecological farmers), the long and often international food supply chains that characterize the modern food system represent a failure of the United States to remain self-reliant. Similar to the criticism some conservatives have posed regarding the reliance of the U.S. on Middle-Eastern countries for our oil supplies, this perspective is based on a relatively isolationist perspective.

The country most frequently brought up in this context was Mexico. For many ecological farmers, the reliance on Mexican agricultural production for fundamental aspects of the American diet represents an over-reliance on foreign countries. For example, Cheryl said:

I just don't think we should be relying on Mexico to send us avocados all year long or strawberries, or blueberries, or whatever. What happens if they decide to stop? Well, we're up a creek then, aren't we?

This perspective is an interesting mix of contemporary political perspectives. On the one hand, it portrays what we might think of as a somewhat distrustful stance toward America's neighbor to the south. Such distrust might justifiably grate against the cosmopolitan sensibilities of more progressive commentators. On the other hand, Cheryl went on to suggest that our society should move toward consuming seasonably-available and locally-grown food, a perspective shared by a variety of progressively-minded food commentators, especially given the carbon intensity of long-distance food transportation.

In addition to Mexico, several ecological farmers were reluctant to rely on food even from within the United States. For this perspective, Western states, including California and Washington, replaced Mexico as the point of comparison. For example, Marcus argued that although his apples had to compete with those imported from Washington, his customers knew the benefits of supporting local growers, particularly in the context of the pandemic:

Shit's gotten wild in the past year... I think a lot of people are realizing that maybe getting apples from two thousand miles away in Washington is not such a great idea. But we'll be here next year and the year after that, growing apples in the right way and people know that.

Of course, the theoretical benefit of buying local apples supports Marcus' business in the short term. It could be the case that Marcus is simply playing on fears spurred by the pandemic to encourage customers to buy his products. However, this perspective demonstrates a unique political standpoint. The isolationism inherent in the argument suggests a form of conservatism, particularly given that the examples used were Mexico, California,<sup>30</sup> and Washington, of which the first two have been loudly criticized by President Trump and other prominent Republicans. Conversely, buying local and ecologically-produced food demonstrates a type of progressive politics that resists the power of large corporations.

### *Gender*

One of the major differences between talking to ecological farmers and industrial farmers was the proportion of women. As mentioned, I was able to interview eight women involved in industrial agriculture, several of whom I sought out specifically in order to balance the sample. This number is only slightly lower than the proportion of women in the field of agriculture according to the USDA (USDA 2017). Conversely, twelve of the twenty-five ecological farmers I interviewed were women. Whereas feminism was not important for the industrial farmers, several of the ecological women farmers found feminism to be an important ideological force in their political lives. In addition, several men discussed the role of gender in ecological farming, focusing mainly on how they feel able to manifest alternative forms of masculinity.

---

<sup>30</sup> Of the four ecological farmers who mentioned concerns about long-distance, domestic transport of food products, two mentioned California and two mentioned Washington.

For some of the women I interviewed who farm under the logic of ecological agriculture, traditional notions of gender align with the logic of ecological agriculture. For three of the twelve women ecological farmers, notions of motherhood, nurture, and connection to the earth are part of what makes womanhood and ecological farming a good match. Here, Sarah explains that she thinks the dominance of men in industrial agriculture is a big part of the problem:

Maybe it's the fact that it's so male dominated that is part of the problem, don't you think? I mean, maybe if we had some more of that soft touch that women have in agriculture, maybe we wouldn't be destroying the earth so quickly.

The perspective that Sarah alludes to here is an essentialist form of gender differentiation. For Sarah, women's "soft touch" would be useful in agriculture because it counteracts the destructive nature of men.

Sarah's perspective is shared even more directly by Nicole. She told me that she thought it was important for women to be involved in agriculture, and particularly within the organic movement. In response, I asked her what she felt was important about women's involvement in agriculture and she had this to say:

Well, women are natural farmers. Natural nurturers and gatherers. In my experience, women pick up the idea of working in harmony with nature more quickly than men. For so long, we've had the hunters, the men out there doing the farming and... it's just different wiring. We're wired different.

This quote from Nicole further develops the perspective shared by Sarah. For Nicole, the facility that women have with ecological farming goes deeper than simply a “soft touch.” From her viewpoint, women have a natural propensity for nurturing and understanding how to work in harmony with nature.

For the other nine women in the sample of ecological farmers, the relationship between gender and ecological farming is slightly more complicated. For example, Amy also said that she thought women tended to have a natural relationship with ecological farming, but emphasized that this was at least partly due to social factors:

I think we’re a lot more systems-focused in a lot of ways. And so, I can look at a whole ecosystem and say, ‘We need trees over here and this here and this here.’ .... I think that’s mostly conditioning. Maybe a little bit of nature... I also think that women should just be in every field, everywhere.

Amy’s perspective puts significant nuance into the perspective shared by Nicole and Sarah. Although she says that her sense of women’s affinity for ecological farming is at least partly natural, it is also due to “conditioning.” The focus on systems allows women to recognize the needs of farms that are situated within natural systems.

The final perspective on gender shared by the women who were interviewed for this project was about responding to discrimination. From this perspective, the reason that both women and people of color should be involved in agriculture is because of their historical exclusion from positions of power within the farming regime. Sandra put this perspective most clearly when I asked her about the importance of women in farming:

Oh, we need more women farmers. That's for damn sure. We also need more black and brown farmers. Food shapes who we are and if you don't have a seat at that table, you're going to have a hard time shaping who we are... If you only have one type of person farming, a lot of people aren't going to be heard.

Whereas Sarah and Nicole argued that women are good farmers by nature and Amy thought that the conditioning of women leads them to tend to have a good sense for agriculture, for Sandra it is a matter of power. By excluding women and people from having a seat at the table, only the perspectives of when men are heard. As such, it is important for women and people of color to become involved in farming in order to have their perspectives heard.

The remaining women in the sample fell somewhere between the three perspectives shared here. Sarah, Nicole, Amy, and Sandra were the most explicit about their feelings on the relationship between gender and farming, but the remaining women in the sample of ecological farmers were all clear about their support for women in farming.

With the women in the sample of ecological farmers, the topic of gender came up fairly easily. I was often able to reference previous answers in order to discuss the ways in which gender played a role in agriculture. With men in the sample of ecological farming, gender was a topic I typically had to bring up on my own. In fact, although some of the men in the sample of ecological farmers brought up gender in the context of mixed-gender farming partnerships, none mentioned their own gender as a motivating force in their farming. In other words, whereas many of the women in the sample of ecological farmers saw their gender as an

important factor in their work as farmers (e.g., many used the language “women farmers”), the men did not see their own gender as context for their farming. Rather, as the “unmarked” category, men farmers saw themselves simply as farmers, and only recognized the issue of gender when I asked about it directly.

When I asked the men in the sample of ecological farmers their thoughts on the issue of gender in agriculture, their answers were quite diverse. Two of the thirteen men in the sample of ecological farmers responded that they felt it was very important to recognize the roles that women play in farming families. These two argued that women have, in fact, been involved in agriculture because they play essential roles as mothers and wives. Eight others thought that for a variety of reasons, it was important for women to become more involved in agriculture. Finally, for a group of three men in the sample, their work as ecological farmers allowed them to engage a wider picture of gender roles than they had in other arenas of life.

For two ecological farmers, the most important issue involving gender was equalizing the appreciation of traditionally feminine roles. For these men, traditionally-held roles for men and women need not change. Both suggested that such roles were natural. However, they argued that roles traditionally held by women are undervalued. One such farmer was Richard, who runs an organic farm with his wife:

This whole thing with men and women, you know... I think we need to appreciate the things that women do just like we appreciate the things that men do. That's the problem. Women are naturally nurturing, naturally better

at... those sorts of things. We just need to recognize that without the wives and the mothers around, none of this would be possible.

For Richard, like Nicole and Sarah, gender roles are the result of natural differences. From this perspective, women are natural nurturers whose gifts have not been fully appreciated. Richard seems to believe that appreciating women as wives and mothers is honoring the things that he understands naturally make women different, rather than restricting the roles they are allowed to play. From this perspective, the “whole thing with men and women” is not a problem of role restriction and stratification but of properly valuing our differences.

Eight other men in the sample of ecological farmers also found gender issues to be important but were vaguer about their reasoning. This group argued that the male dominance of agriculture is problematic and that more women should be involved. The reasons given, however, were difficult to parse. For some, like Zack, it seemed like having more women might be good in terms of representing a variety of voices: “I think it’s a great thing that we’re seeing more women in farming. We need all sorts to do what needs to be done.” For Justin, women were seen as very capable farmers: “At this point, women can do everything men can do on a farm. In fact, they’re probably better at most of it.” Part of the implication in this quote from Justin is that the ability for women to do everything men can do on a farm is a somewhat new phenomenon. Earlier, Justin had been discussing the technology he uses on his own farm, so my interpretation of his statement was that the technology available to farmers now removes some of the necessity of any perceived or actual strength advantage for men. Finally, a handful of this group perceived a trend toward more women in agriculture and generally expressed support for such a trend. For example, when I asked James what he thought about more



women becoming involved in agriculture, he said, “I think more and more women are getting into farming. I think it’s great... good for everyone.” Although this group of eight men had varied and somewhat vague ideas about gender diversity in farming, they all supported it and thought that the field would continue to become more inclusive for women.

The final group of men suggested that ecological farming allowed them to exhibit an altogether different version of gender identity. Whereas the other men in the sample thought of gender as a “women’s issue,” these two men recognized that an expanded gender politics also affects the concept of masculinity. For example, Jake thought that farming allowed him to get in deeper touch with his feminine side:

One of the things that farming has done for me is to just open my mind up about who we are. We have all these ideas about what we have to be based on some silly category. I feel a much deeper appreciation for Mother Nature and what a lot of people think of as “women’s sensibilities” as a farmer. I feel like I’m allowed to show more of that feminine side in myself as a farmer.

For Jake, the practice and logic of ecological farming allowed him to break down the “silly category” of gender. As such, he was able to engage in activities and sensibilities that he understood to be stereotypically feminine but that he felt drawn to. Likewise, Christopher told me that ecological farming encouraged him to “put down some of that masculine, manly man energy and learn to be more compassionate, more understanding.” In this way, both Jake and Christopher found that ecological farming allowed them to engage an alternative form of

gender practice. They were able to understand the socially constructed nature of gender and engage only those aspects of masculinity and femininity that they found useful.

In summary, the politics of gender among ecological farmers was quite varied. Although some argued for a greater appreciation for traditional gender roles, others argued for a re-evaluation of gender itself through farming. Although some ecological farmers seemed to understand ecological farming and femininity to be naturally linked, others argued for a more complex relationship between such concepts. Regardless, the politics of gender were important to many of the ecological farmers who participated in this study.

#### *Summary of Political Discourse of Ecological Farmers*

The politics of ecological farmers was quite varied. The main difference between the politics of industrial farmers and the politics of ecological farmers is that those in the latter group were much more likely to say that they were motivated by a particular political agenda. Whether food justice, domestic food security, or gender issues, ecological farmers were often motivated in their agricultural practice by their political ideas. Conversely, industrial farmers often thought about politics from the perspective of farmers but rarely said their practice *as farmers* was motivated by their politics.

In addition to being motivated by support for political ideas including food justice and gender equality, ecological farmers were also motivated by political resistance to the politics of industrial agriculture.

### 3.2.2 Ecological Farming's View of Conservative Politics

As in the case of the section on knowledge, the politics of ecological farmers is motivated in large part by an opposition to the industrial agriculture model. Even the previous section, which focused mostly on the topics that ecological farmers supported, was somewhat defined by reactions to industrial farming. For example, supporting movements for food justice is at least partly motivated by the argument that the industrial model is creating food *injustice*.

Other topics, however, are even more motivated by an oppositional politics to industrial agriculture. Many of the ecological farmers who participated in this study excoriated the industrial agricultural system for being supported by what they called “farmer welfare.” According to this perspective, federal farm subsidies and crop insurance constitute welfare programs for farmers that prop up the industrial system. Furthermore, many ecological farmers were very open about their opposition to President Trump and Republican leaders including Senate Majority Leader Mitch McConnell. However, ecological farmers also attacked the leadership of the Democratic Party from both the left and the right. Finally, a common refrain from ecological farmers was criticism of the power of large corporations. For ecological farmers, many of the issues in modern farming can be traced to the power of large corporations over the politics in the United States.

#### *Farmer Welfare*

As we saw in the section on conservative politics in industrial agriculture, one of the main reasons that farmers cited for opposing taxation was their illegitimate use in welfare payments. Of course, such rhetoric has long been common among conservative political commentators. An

interesting twist on such rhetoric is the accusation that farmers themselves receive welfare in the form of federally-funded subsidies and crop insurance. Ten of the twenty-five ecological farmers who were interviewed for this project used the term “farm welfare.” In addition to long-standing subsidies and crop insurance, ecological farmers also criticized industrial farmers for accepting direct payments from the Trump administration. Whereas industrial farmers saw these payments as reasonable compensation for the fallout of President Trump’s trade war with China, five ecological farmers (including one Trump supporter) said they thought that farmers were selling their votes to Trump. Overall, ecological farmers thought that especially given the rhetoric from conservatives on welfare, government supports for industrial farming represents the height of hypocrisy.

The specifics of support for farmers from the federal government are complicated and change frequently. Every five years, the government passes a farm bill, which can radically alter the support structure for industrial farmers. For ecological farmers, the specifics of such supports were not exactly at issue. Rather, ecological farmers argued that the government supports industrial agriculture in such a way that makes it unfair. One of the common issues brought up by ecological farmers was farm subsidies. Five out of the ten farmers who criticized farm welfare brought up subsidies. For example, Andy said he thought the subsidies supplied to industrial farmers encouraged bad behavior:

These big farmers get subsidies from the government to keep doing what they’re doing, even though we know what they’re doing isn’t good. But they’re just going to keep planting monocrops and spraying chemicals forever because the government pays them to do it.

From Andy's perspective, the government encourages farmers to continue using agricultural practices that are known to be harmful through the use of subsidies. Again, the specifics of the subsidy structure were not explored. For Andy, the issue is the existence of the subsidies. Interestingly, the arguments made by Andy and conservative farmers are somewhat similar here. Whereas conservative industrial farmers argued that welfare payments to low-income individuals encouraged laziness, Andy argues that welfare payments to farmers encourage environmentally-destructive farming.

A more specific example of the support that the federal government provides for industrial agriculture is crop insurance. Under this program, farmers are allowed to sign up for insurance programs on their crops. If weather events or unexpected pest pressure decreases the yield of a field below a set level, the farmer receives payments from the insurance program. Farmers must pay into the program as with typical insurance program, but crop insurance is also financially supported by the USDA.

For some of the ecological farmers in the sample, crop insurance was a major concern. Similar to the criticism of subsidies, three of the ecological farmers said that they felt the federal crop insurance program encouraged industrial farmers to persist in bad behavior. From their perspective, crop insurance increases the relative risk of moving toward any alternative forms of agriculture. Paul put it this way:

If the government is going to guarantee me a paycheck, of course I'm going to keep doing what I've been doing. It makes the risk of trying something else

too high. If I'm a corn-soybeans-wheat guy, and I know I've got crop insurance, why would I take a risk on something new?

On several occasions, Paul used this technique of putting himself in the shoes of an industrial farmer. On this occasion, he argued that the logical move (i.e., the move that he himself would make were he in that situation) for an industrial farmer is to continue the practices that minimize risk. Although Paul's own practice goes against this logic, he argues that once one is in the situation of industrial farmers, the incentive structure encourages behavior he considers to be unsustainable. In this way, he criticizes the system of federal support for industrial agriculture through "farm welfare," but recognizes the position that industrial farmers themselves are in.

Whereas Paul empathized with industrial farmers, two others directly criticized industrial farmers for taking payments from the Trump administration. For one, the issue was that most of the money from the payments under the so-called Market Facilitation Program (MFP) went to large farmers. Darren was upset because he did not receive payments from the government, but he heard that large farmers near him had received large payments:

Now I'm not saying I wanted those checks. We do just fine without them. But the fact that the [neighbors] down the street got huge checks just because they're already... huge doesn't make a lick of sense to me. But that's how it goes I guess and I'm sure they'll vote him back into office.

For Darren, this example marks yet another injustice in an agricultural system that already supports large farmers at the expense of the little guy. In addition, he suggests that his

neighbors who own a large farm will likely support Trump in the 2020 election, partly because of the MFP payments.

Jan made a similar but more direct comment about large farmers supporting Trump because of the MFP payments. Although Jan supported Trump, flying a MAGA flag on the outside of her barn, she also felt like the MFP payments were a bad move and farmers should not have taken them:

I think President Trump has done a great job on almost everything. I'm not a big fan of those checks he wrote to big farmers, though. I think he basically had to do it to keep people happy while he was dealing with China, but farmers shouldn't have taken them. It makes it look like their votes can be bought! Actually, if you ask me, their votes can be bought, but that's a different story.

This was one of several instances of Jan mentioning her support for the Trump administration. Although she did admit that she did not think the MFP payments were a good idea, she justified this move by the Trump administration by saying that he had to do it to "keep people happy." The blame therefore falls on the farmers who took the payments. This was but one of several instances in which Jan took the opportunity to excoriate industrial farmers. As we see in this case, Jan's support for the Trump administration remains unwavering despite policy disagreements. Rather than excuse farmers and blame government systems like Paul did, Jan excuses the government run by Donald Trump and blames individual farmers.

Such instances of ecological farmers criticizing industrial farmers for accepting “farm welfare” came from across the ideological spectrum. Overall, however, the criticism often came with the recognition that many industrial have conservative ideas about traditional welfare payments to low-income communities. As Jake said at one point, “These guys hate it when we give some folks down in Detroit or something a hand. That’s welfare, right? But when they have a bad year, they sure as hell are going to have their hand out.” Although some ecological farmers like Paul recognized the systematic incentives that make accepting such payments necessary for industrial farmers, all who brought up this system of “farm welfare” were ultimately very critical. For these ecological farmers, such a system both encourages bad behavior and represents an injustice in the system.

### *Republicans*

Of the twenty-five ecological farmers interviewed for this project, only three said they supported Republican politicians. All three said they supported President Trump but did not go as far as to identify explicitly as Republicans. One of the three identified as a libertarian, and the remaining two did not signal their party affiliation. Of the twenty-two remaining ecological farmers, seven either preferred not to discuss party affiliation, or our interview ended before we could discuss such issues. Of the remaining fifteen, some said they supported Democrats, others mentioned supporting progressive causes such as Black Lives Matter, and one even identified as a communist. However, all fifteen of the non-conservative ecological farmers with whom I was able to speak about politics were critical of the Republican Party. In some cases, particular politicians including Donald Trump and Mitch McConnell were mentioned as reasons for their opposition to the Republican Party. In other cases, the Republican Party in general was



criticized, usually for their resistance to mask mandates. Whatever the reason, these farmers were typically eager to share such critiques and did not hold back their contempt.

President Trump was the most frequent target of choice for progressive ecological farmers. Of the fifteen progressive ecological farmers with whom I discussed politics, nine were critical of Trump's presidency. The particular reasons why these farmers were critical of President Trump were fairly diverse. For two, no other reason than "he's an idiot" was needed. Michael put this perspective quite poignantly. When I asked him what he thought about Trump's presidency to that point he said, "What do I think of him? I think he's a f\*\*king idiot is what I think." Michael did not care to delve deeper into this perspective, and instead chose to move on to other topics.

For other ecological farmers, specific actions and policies of the Trump administration were pointed to as reasons for their criticism. For example, two ecological farmers brought up the issue of the separation of immigrant families at the border and the placing of children in confinement. The term "children in cages" was used in both cases, as when Harriet said:

Putting children in cages should have been the end of it. I don't know how he's still in office after that... I mean how can we as a country condone such a thing? He's done a lot of things I don't like, but I think that was the point when I said, "this guy is really dangerous."

At the time when Harriet and I spoke, her position on family separation and the confinement of children was a common criticism of Trump. As we see in this quote from Harriet, such treatment of children was understood to fundamentally shake the moral standing of the United

States. Whereas Trump supporters praised Trump's toughness on illegal immigration, commentators including Harriet thought that such treatment of vulnerable populations was illegitimate, despite the legality of their behavior.

Finally, the remaining five ecological farmers who were critical of Trump's presidency took issue with the relationship between his temperament and his ability to carry out the duties of the presidency. Whether interacting with other global leaders or setting a national tone for the United States, these ecological farmers thought that Donald Trump was simply not up to the task. For example, after Zack told me he was concerned about what a second Trump presidency might bring, I asked him what he was most concerned about. He responded:

I think he's a narcissist. He just doesn't care about what other people think or need. It's not a good characteristic of a person that needs to... work together with other world leaders. I think the world is more unstable with him as president... You just never know what he's going to do.

For Zack and four other ecological farmers, Trump's personality made him a particular threat as president. Several mentioned that they thought Trump was a narcissist. One said that they thought he was simply "unkind," which they argued was reason enough for him not to be president.

Although the reasons for disliking Trump were abundant, these ecological farmers were united in this position. One could argue that the folks who simply said "he's an idiot" should be included with those who specifically argued that Trump's temperament made him ill-fit for the job of president. If so, we see that a vast majority of the criticism of President Trump in this

sample revolved around his personality and its perceived mismatch with the role of president. For the others, particular issues including the separation of families and the confinement of children serves as cogent examples of the failures of Trump's presidency.

The remaining ecological farmers who criticized the Republican Party also took the party as a whole. In fact, three ecological farmers argued that the resistance to mask mandates among a large portion of Republicans was a major reason for the continuation of the COVID-19 pandemic. For example, Anna said:

The fact that we're in the middle of pandemic and Republicans can't get their heads around wearing masks is so indicative of where we are right now as a country. People are more interested in winning political points than saving lives and it's just sad I think.

Anna's perspective was shared by two other ecological farmers. For these three, rhetoric from Republican leaders resisting the wearing of masks was responsible for at least some of the deaths that resulted from COVID-19. From Anna's perspective, the rhetoric shared by Republicans on this issue was specifically designed to win points from the Republican base that was also resistant to wearing masks. As Jeff, another ecological farmer who criticized Republicans' response to the pandemic, said, "Republicans could have told their base that this was serious, but they got on the anti-mask train instead."

These criticisms of the Republican Party were fairly common among ecological farmers. Whether pointing to particular Republican leaders or the entirety of the Republican base, these ecological farmers found the political right in the United States to be an oppositional entity.

That is, whether as the result of particular policies, the personalities of individuals, or general attitudes toward public health, this subsection of ecological farmers defined themselves at least in part as opposed to Republicans. As we saw with industrial farmers, such oppositional political identity is often communicated with considerably more energy than supportive positions.

### *Democrats*

Although ecological farmers tended toward the left end of the political spectrum and mainly criticized Republicans and conservatives, several were also critical of Democratic politicians. This criticism came in two forms. The first, of which there were only two examples, were instances of conservative ecological farmers criticizing Democratic politicians for being overly progressive. The second form of criticism came from the left side of the political spectrum. For five ecological farmers, the Democratic Party has yet to live up to its progressive potential, particularly with respect to agricultural policy. Whether from the left or the right, criticisms of Democratic politicians typically portrayed them as out-of-touch bureaucrats who are unaware of the necessities of modern farming.

The two ecological farmers who criticized Democratic politicians from the right side of the political spectrum both identified as Trump supporters. Their criticisms of Democrats were similar to those made by industrial farmers, if perhaps a bit stronger. Jan was the most outspoken ecological farmer against Democrats, saying:

The problem I have with the Republican Party is that they haven't done enough to stop the "Demoncrats" ... I call them "Demoncrats," and that's kind

of just my joke but I really do think they're that bad... They're pedophiles and murderers or they're supporters of pedophiles and murderers.

Jan was the only member of the entire sample who made such claims. The claim that Democrats are "pedophiles and murderers" was part of a larger worldview than Jan shared with me that included the belief that Bill Gates intended to use COVID-19 vaccines to curb the global population saying, "I think anyone who gets the vaccines will be dead within five years."

Although we may dismiss this perspective as conspiratorial in nature, we have seen such ideas gain traction in recent years with the growth of support for QAnon (two representatives in the U.S. House of Representatives have voiced support for QAnon) as well as the January 6<sup>th</sup>, 2021 riot at the US Capital in response to the debunked claim that the election had been stolen from Donald Trump. Although only one member of my sample expressed these ideas explicitly, we can also think of such perspectives as an extreme form of a more common idea: that the government is not to be trusted, that those in government are different than "normal folks" such as those who farm, and that such difference constitutes a pernicious divide in American society.

Indeed, such concepts (albeit in a milder form) were present among those who criticized Democratic politicians from the political left. Of the five ecological farmers who criticized Democratic politicians and policies, three mentioned President Obama specifically. These farmers thought that Obama had made significant promises regarding environmental protection that his administration had failed to live up to. For example, Cara had this to say when I asked her about the relationship between politics and agriculture:

I got into farming right when Obama came into office. We had so much hope. He was going to make us more sustainable, he was going to solve the financial crisis, all this... But then we had eight years of him and especially in ag, nothing happened. The big farmers got bigger, little folks like me and my husband and a lot of my neighbors got squeezed, and we're nowhere better than we were before.

Cara went on to say that she would much prefer Obama over “the guy who’s there now” (this interview was in the summer of 2020 while President Trump was in office) but remained critical of the Obama administration’s agricultural policies. For Cara, the progressive promises made by the Obama campaign failed to materialize in large-scale changes in the real world during his administration. For Cara and others, the failure of the Obama administration to live up to progressive promises is yet another example of the failure of people in power to take care of “the little folks.”

The remaining two ecological farmers who were critical of Democrats were likewise critical of what they perceived as a failure to be progressive enough. Interestingly, one said that the failure of the Democratic Party had to do with its capitulation to Republicans. As James put it:

I’m not sure why Democrats keep trying to be bipartisan. I mean, one party actively tried to overthrow the government, right? And now Democrats are like, “Hey. How can we work together?” No. Stop worrying about them and start worrying about how to do the things that need to be done.

James' interview came near the end of the data collection process and as such, benefitted from having occurred after the events of January 6<sup>th</sup>. For James, the attempts by the Democratic Party at bipartisan politics fails to realize the depravity of the Republican Party. Although he is certainly critical of Republicans, he also takes Democrats to task for failing to play the political game at hand. From James' perspective, Democrats will only continue to fail in their drive for progressive politics if they continue to try to appease Republicans. Such failures have real consequences, as James later pointed out: "We have to solve climate change now, and if Republicans are in the way, we can't worry about making them happy."

Such criticisms of the Democratic Party demonstrate the variation present in the sample of ecological farmers. Whereas some ecological farmers criticize the Democratic Party from the (far) right, others criticize it from the progressive left. As a whole, however, these criticisms generally support a worldview that even for those ecological farmers that tend to vote for Democratic politicians and lean politically to the left, politicians of all stripes remain untrustworthy figures.

### *Corporations*

Whereas both Democrats and Republicans came under significant fire from ecological farmers for failing to enact good policies, the fundamental cause for such failures was most often attributed to corporations. For seven ecological farmers, the power held by corporations (such as Bayer (Monsanto), John Deere, and ADM) is the reason for the perceived brokenness of the American agri-food system. According to these ecological farmers, corporations control

politicians through donations and lobbying while also limiting the options available to farmers themselves.

For three of the seven ecological farmers who were critical of corporate power, the issue lies in the fact that corporations can control politicians through lobbying efforts. For these farmers, such efforts create a scenario in which powerful actors retain their power, and in the field of agriculture, are allowed to continue their environmentally-destructive behavior. This perspective was exemplified by Anna, who tries to support fellow ecological farmers but argued:

It's just really hard when we're fighting against the money that Bayer can throw at the problem. We might get a little concession here and there from the legislature... Maybe a little extra cash for implementing a better pest management system or something like that but the system is always going to benefit the large growers because the companies that benefit from the system are the ones that can pay for it to keep benefitting them.

As we see in this quote, Anna is committed to improving the lives of ecological farmers at a large scale. She told me during our interview that although she appreciated the work that individual farmers do, "the change needs to happen at a higher level." For Anna, the fight to move agriculture in the direction of the ecological logic is made exceedingly difficult by the dominance of the industrial logic among those who make large-scale decisions. From Anna's perspective, this industrial logic is supplied to politicians by lobbyists paid by large corporations.



Although she also tries to influence policymakers, she recognizes that she simply has fewer resources and consequently only really ever achieves small benefits “here and there.”

In addition to the power held by large corporations over politicians, four ecological farmers argued that corporations had too much power over farmers themselves. Similar to the perspective of some ecological farmers on the issue of farm welfare, these farmers recognized the predicament in which industrial farmers find themselves. For example, Jessica said:

I’m obviously not a big farmer, but I think it would be tough if I were. I mean, in order to make any kind of money, you have to buy seed from Monsanto, and you have to buy a big tractor from John Deere or whatever, and you have to sell your crop to ADM. When these companies are the only option, what are they supposed to do?

This perspective from Jessica places the blame squarely on the system of large agribusiness corporations, rather than on the farmers themselves. Jessica recognized that industrial farmers find themselves in a situation in which corporations have positioned themselves as the only option. As a farmer herself, she recognized the narrow margins involved and sympathized with the limited options available at each stage of the agricultural process.

Interestingly, one of the ecological farmers who was critical of corporations was Karen, who also considered herself a Trump supporter. For Karen, corporations were similar to the government in the sense that they represent distant actors without real concern for the local issues of communities. As she put it:

Tyson doesn't care if they give you heart disease. None of these big corporations care. They care about making a profit, and the best way to do that is to make farms bigger.

From Karen's perspective, the local services provided through her business and other ecological farmers in the area are important because they recognize the health needs of the community. Her criticism of large corporations did not seem to conflict with her conservative ideals, as she seemed to argue that capitalism as embodied by local businesses would solve such problems.

Criticisms of corporations from ecological farmers bear some similarity to criticisms of politicians from both industrial and ecological farmers. The sense is that the people in charge of large corporations are far away and do not care about the lives of the people who are affected by their business practices. From the perspective of ecological farmers, the drive for corporate profit leads to unfair results both because corporations can buy the favor of politicians and because industrial farmers end up reliant on the products and services of large agribusiness companies. The result is a food system that exploits farmers and farm workers, provides unhealthy food to communities (when it provides it at all), and damages the environment.

### *Summary of Politics within the Logic of Ecological Agriculture*

As we have seen, oppositional identities play a powerful role in contemporary American politics. Although many of the farmers that were interviewed for this project described their support for various policies, the most vociferous and passionate discussions of politics came when farmers described their opposition to other political identities. In the case of ecological

farmers, welfare for farmers, politicians of all stripes, and the power of large corporations were examples of an oppositional politics that inspires significant energy.

As we have also seen, there was considerable variation in the manifestations of oppositional politics among ecological farmers. Whereas only two industrial farmers identified as Democrats (and rather weakly so), ecological farmers ranged from conservative libertarians to Trump supporters all the way to progressive Democrats and even communists. Still, there remained patterns in the ways in which ecological farmers formed an oppositional political identity. The unjust infringement by distant individuals and groups, whether government or corporate, over the lives of farmers and their communities was a common theme.

Ecological farmers pointed to particular politicians and companies as examples of the brokenness of the American political and agri-food system. For ecological farmers, distant political and corporate actors are inherently disinterested in the material needs of local communities, both economically and environmentally. That is, from the perspective of ecological farmers, large corporations, politicians in general, as well as the dominant system of industrial agriculture are worthy of resistance because the interests of such actors are fundamentally at odds with the logic of ecological agriculture.

### 3.3 Conclusion: Polarization or Fragmentation in Agricultural Politics?

If there is a dominant narrative about contemporary American politics, it is that we are more polarized than ever. Various political commentators have placed the blame for such polarization on everything from the twenty-four-hour news cycle to social media to politicians across the political spectrum. As we have seen, the interviews conducted in this project provide

ample evidence for such a conclusion. Ecological and industrial farmers often support opposite political parties and policies as well as contradictory cultural norms. They also often define themselves most energetically by their opposition to their perceived political enemies. In this way, the politics represented by the farmers in this sample mirror the political spectrum in the United States as a whole.

However, this picture of two unified political poles leaves much to be explained. As we have already seen, significant variation exists within what we might otherwise think of as the monolithic politics that constitute the logics of industrial and ecological agriculture. Within ecological agriculture, some farmers manifested a libertarian worldview whereas others could be more accurately considered socialist or even communist. This wide range of ecological farming ideologies must necessarily come together at the farmers' markets, online forums, and advocacy groups that constitute the social space of ecological agriculture.

Furthermore, significant political variation also exists among industrial farmers. Although the two industrial farmers who identified as Democrats were not overwhelming in their support for progressive politics, their strong identification with the Democratic Party demonstrates the possibility of such a phenomenon. It is also worth mentioning that there is a long history of American farmers supporting progressive politics, most particularly in the Progressive Era of the late-19th and early-20th centuries. In addition, there was also several different types of conservatism represented by the industrial farmers in this study. Whereas some industrial farmers stood strongly in the camp of fiscal conservatism, others took a more culturally conservative approach inspired by religious identity. Such variation has long been

characteristic of the political right in the United States, but also complicates our notions of polarization.

The politics of the farmers I interviewed for this study overlap in important ways. Although the contemporary American political moment is defined by polarization and oppositional politics, the farmers I interviewed were virtually united in their respect for one another. Industrial farmers may criticize the progressive ideology they believe leads many to support ecological agriculture, but they also recognize the hard work and dedication required to farm in an ecological manner. Likewise, although some ecological farmers were critical of the behavior of industrial farmers, most also said they recognized the hard position that industrial farmers find themselves and appreciated their contribution to the American food system. Additionally, farmers across the board found themselves in an oppositional position to entrenched interests and corruption in politics. Such populism has also been a mainstay of recent American politics and could constitute a meaningful place of unity and compromise.

| <b>Table 3. Typology of Politics Among Farmers</b> |   |   |
|--|---|---|
|  | Industrial Agriculture  | Ecological Agriculture  |
| Polarized  | <ul style="list-style-type: none"> <li>• Anti-regulation; anti-taxes</li> <li>• Traditional gender roles</li> <li>• Rejection of progressive social movements</li> </ul>  | <ul style="list-style-type: none"> <li>• Focus on food justice and domestic food security</li> <li>• Rejection of masculine dominance of agriculture</li> <li>• Accuse industrial ag of “farmer welfare”</li> </ul> |
| Fragmented   | <ul style="list-style-type: none"> <li>• Some identify as Democrats (uncommon)</li> </ul>   | <ul style="list-style-type: none"> <li>• Some consider themselves progressives, others libertarians</li> </ul>  |
| Overlapping  | <ul style="list-style-type: none"> <li>• Generally speak positively of other farmers; mutual appreciation for hard work</li> <li>• Rootedness in a particular area</li> <li>• Distrustful of outsiders</li> </ul> |   |

### 3.3.1 Fragmentation in the Politics of Ecological and Industrial Farmers

In Part 1 on knowledge in agricultural systems, farmers fell neatly into opposite camps.

Although there was variation in the ways that impact and production science structured the agricultural practices of the farmers in this study, ecological farmers largely identified with impact science whereas industrial farmers largely identified with production science.

Conversely, the variation among farmers in terms of political affiliation was much more pronounced. That is, despite the link often made by academics and the public between political progressivism and ecological agriculture, the ecological farmers I interviewed held a wide variety of political ideologies. Additionally, although many industrial farmers were generally politically conservative, there were two who identified as Democrats and several others were reluctant to identify explicitly as conservative.

The variation among ecological farmers demonstrates a tension within the logic of ecological agriculture. On the one hand, criticisms of the environmental impact of industrial systems have long been a position held by the political left in the United States. As Julie Guthman and others have pointed out, the typical consumer of organic and alternative agricultural products is relatively affluent, highly educated, white, and politically liberal. As such, ecological farmers engage a consumer base that is both cognizant of the purported benefits of ecologically-grown food products and willing and able to pay a price premium for such products. Guthman and others have pointed out that the reliance of the alternative agriculture movement upon such upper-middle-class “foodies” prevents the movement from addressing larger goals of social and racial justice.

On the other hand, the politics of the ecological farmers that were interviewed for this project were much more varied than the image above would suggest. Whereas critics like Guthman and others point out the failures of the alternative agriculture movement to live up to progressive political ideals, the members of the movement itself have differential levels of commitment to such ideals. Although the popular conception of ecological agriculture is as a member of the constellation of ideas that that make up the progressive end of the contemporary American political landscape, the prevalence of conservatism among the ecological farmers in this study demonstrates that political ideas do not always have to fit neatly within polarized groupings. Many of the ecological farmers that were interviewed for this project came to the logic of ecological agriculture through a critique of industrial agriculture that aligns with a progressive political identity. Others, however, came to the same conclusion but from what might be considered an entirely oppositional political orientation.

For ecological farmers, this plays out in at least two ways. The first is an overlap between political progressivism and what has come to be known in the United States as libertarianism. Considered along a linear spectrum from left to right, we might think of the progressive politics of ecological agriculture to be as far from the “right of right” libertarianism of Rand Paul. Whereas we might categorize the former group as inspired by the anti-corporate writings of eco-feminist Vandana Shiva, we can think of the latter group as inspired by the *lasses-faire* capitalist writings of uber-individualist Ayn Rand. When seeking to understand the supposed failures of the ecological agriculture movement to live up to progressive political ideals, we must understand the significant role played by the political fragmentation of ecological farmers themselves.

The second way this fragmentation plays out is a more standard division of the political left. On the national political stage, we see the divisions between the moderate reformism of Joe Biden or Hillary Clinton played in opposition to the more radical progressivism of Bernie Sanders or Alexandria Ocasio-Cortez. Among ecological farmers, this same dynamic plays out in the difference between, for example, the large-scale organic operation run by Michael and the communal homestead run by Jake. For those members of the moderate wing of the political left in the United States, the general structure of our systems is functional. In Michael's case, the industrial agricultural model has flaws, but need not be totally reinvented. Instead, Michael works with the government to develop and follow new guidelines and standards to modify the existing system in order to achieve adjusted goals. That is, by using impact science to develop new regulations and practices, the system can be adjusted to combine the logics of ecological and industrial agriculture. In contrast, those members of the more radical wing of the political left in the United States want vast overhauls to the American system. In Jake's case, the only response to a broken system of which industrial agriculture is but one aspect is a complete reimagining of the system. The land that Jake has access to has allowed him to create an alternative vision of the world in which individuals work in community to provide food and meaning for themselves and one another.

Such political fragmentation among ecological farmers makes it difficult for the ecological agricultural movement to coalesce and move strategically toward particular goals. Whereas moderately progressive ecological farmers who work with the government would prefer a regulatory approach to improving the agricultural system in the United States, conservative, libertarian, and more radically progressive ecological farmers prefer to instantiate



an alternative vision of modern agriculture without the input of governmental bodies. Although the ecological farmers that were interviewed for this project were united in their criticism of industrial agriculture, it remains unclear how the logic of ecological agriculture might become more dominant, given the fragmentation demonstrated here.

Of course, ecological farmers were not the alone in their fragmentation. Although there was a wider range of variation among ecological farmers in this study, there was also political variation among industrial farmers. The most obvious form of variation was the two industrial farmers who identified as Democrats. As discussed, these farmers were not particularly loud in their support for progressive policies. Rather, they considered themselves to be part of a tradition of farmers in support of the Democratic Party in the United States. These farmers considered such support to be handed down to them from previous generations, and therefore was more an expression of political identity rather than an endorsement of a particular policy platform. As we have seen though, expressions of political identity, particularly when oppositional in nature, can be highly motivating.

Furthermore, we can think of the presence of industrial farmers who identify as supporters of the Democratic Party as remnants of an earlier time when such a phenomenon would not have been so rare. In the Progressive Era of the late-19<sup>th</sup> and early-20<sup>th</sup> century, many farmers in the Midwest supported politicians who hailed the American farmer as a beacon of American values. These politicians favored support governmental support for family farms while encouraging traditional gender roles within families (Nugent 2009). Furthermore, many of the New Deal policies of the 1930s and 1940s were directly aimed at supporting family farmers.

Indeed, what sometimes gets lost in conversations about industrial farming is the continued presence of small- and medium-sized family farms in the United States. It is certainly the case that these enterprises are becoming increasingly difficult to keep afloat. Every year, several hundred family farms in Michigan alone are forced to sell off their assets as the margins in agriculture continue to narrow and large farms continue to accumulate land in order to maintain profitability. The economics of this process will be discussed in greater depth in the next section. The point here is that, at least for now, there remains a contingent of small- and medium-sized farmers that have yet to get out of the farming business.

The implications of such a dynamic for politics is the important point here. The farmers that I interviewed for this project feel that both Republican and Democratic politicians have passed legislation that have benefitted large farms at the expense of small farms. Environmental regulations and higher tax rates are easier to deal with for large farmers than they are for smaller ones. In addition, the narrowed profit margins imposed by market globalization have favored large farmers and left many smaller farms perpetually in the red. Although the numbers of small- and medium-sized farms in the United States is shrinking, the continued presence of such organizations represents significant political fragmentation among industrial farmers.

If there remains significant variation among industrial farmers on farm policy, why did only two industrial farmers identify as Democrats? If policies from both Republican and Democratic politicians have benefitted large industrial farmers at the expense of smaller ones, why did almost all of the industrial farmers I interviewed identify as Republicans? I offer two explanations. The first is strictly cultural. That is, both because Democrats have come to be

seen as the party of urban constituencies and because Republicans have come to be seen as the party of the rural vote, farmers tend to identify as Republican. As we saw in the oppositional politics section, industrial farmers think of Democrats as distant bureaucrats trying to impose their will upon the lives of farmers and are therefore resisted. In addition, I am sure that race plays no small part in these dynamics. That is, the urban-ness of the Democratic Party has also become associated with racial minorities, which also constitutes a reason (conscious or subconscious) for industrial farmers to think of it as oppositional.

The second reason has to do directly with the logic of industrial farming. Whereas both the environmental regulations of Democratic politicians and the free marketization promoted by Republican politicians have harmed small- and medium-sized farmers, the former conflicts with the logic of industrial farming and the latter supports it. In the logic of industrial farming, the goals are to maximize profit first, and production second. On the one hand, the free market rhetoric of Republican politicians argues that by removing regulations and governmental supports, the best businesses will thrive. As such, the failure of any individual farmer to be profitable is the fault of that farmer to conduct his or her business effectively. Because the goal within the logic of industrial agriculture is to maximize one's own profit, the rhetoric of a free market rings true. Farmers say to themselves, "If I work hard enough and make smart moves, I can be profitable."

On the other hand, the environmental regulations of that are pinned on Democratic politicians contradict much of the logic of industrial agriculture. Primarily, such regulations place barriers between farmers and profitability. In addition, such regulations are imposed by theoretically distant individuals who farmers perceive as both ignorant of the lives of farmers

and pretentious in the sense that they think they can tell farmers what they should and should not do on their own farms.

For ecological farmers, political fragmentation results in a somewhat directionless movement. The goals of the ecological agriculture movement are unclear because ecological farmers come to the movement with varied and contradicting political agendas. Conversely, the political fragmentation that exists among industrial farmers serves to reinforce the dominance of the logic of industrial agriculture. Despite the contradictory interests inherent in differentially-sized industrial farms and remaining remnants of previous eras in which some farmers supported progressive policies and politicians, the dominant politics among industrial farmers is strongly conservative.

### 3.3.2 Overlaps in the Politics of Ecological and Industrial Farmers

The political fragmentation within both ecological and industrial agriculture significantly complicates the narrative of polarization that is dominant within the mainstream discourse. In addition, I argue that there are areas of overlap between ecological and industrial farmers that build upon the fragmentation within each supposed pole. Despite the intense oppositional rhetoric we have seen, farmers of all varieties recognize the value in other farmers, particularly in their value to local communities. Furthermore, this value for local communities is counterposed among farmers with a distrust for outsiders. The independent and populist streak that characterizes many of the farmers who participated in this study leads to a unified resistance to distant power structures, particularly within the government and the media. Such

areas of overlap between supposedly monolithic and oppositional poles draw further attention to the limitations of the polarization thesis.

Farming is a unique profession in the modern world. While the number of farmers in the United States continues to decrease, those who continue to work in the agricultural sector find themselves in an increasingly unique role. Few other professions in technologically-advanced nations are as characterized as agriculture is by weather patterns, yearly cycles, and interactions with the natural world. Based on the interviews I conducted, the men and women who make their living growing food and fiber for the rest of society feel the weight of their role and recognize the value of their fellow farmers. This is true beyond the ecological-industrial polarization, too. When I asked farmers about the practices and beliefs of the “other side,” many had many a harsh word for the opposing system. For many ecological farmers, the industrial agriculture system is fundamentally broken, damaging to the environment and harmful to the people who consume its products and live near its farms. For industrial farmers, farmers’ markets and CSAs are typically considered cute luxuries for the urban well-to-do while the USDA’s certified organic program is misguided at best and actively dangerous at worst.

However, as was the case in the chapter on knowledge, I almost never heard farmers speak ill of other individual farmers. Although Jan did have some choice words for farmers who accepted MFP payments, other ecological farmers were always reticent to criticize their neighboring industrial farmers. When I spoke to ecological farmers, I often tried to pose the question of how they felt about industrial farmers in a way that would allow ample room for criticism. For example, when I spoke with Cara, I said, “I know you have [big farmers] near you. Does it ever concern you that their sprays or pesticides or anything like that is going to get onto

your farm?" I anticipated her response to be critical of her industrial farming neighbors, but instead I was met with understanding and compassion. "I can't blame them for what they're doing. They're doing their best to put food on the table and who can argue with that. They're good people and they've always been good neighbors." This theme seemed almost universal among ecological farmers. Although they were critical of the practices of industrial farming, they were always careful in their understanding of industrial farmers.

The same was largely true of industrial farmers. Although many of the industrial farmers I interviewed had several reasons why the logic of ecological agriculture made no sense to them, they rarely had a bad word to say about ecological farmers themselves. In fact, many told me that they appreciated the presence of locally-grown food in their communities. For example, Benjamin told me that he liked to buy vegetables from a neighbor who typically sells organic produce at the local farmers' market. He said, "I usually go over there a couple times a month to grab some fresh tomatoes or whatever he's got at the [farm]stand. I don't care so much about it being organic, but I like that it's grown right down the street." It seemed that although industrial farmers considered ecological agriculture to be a general threat to their livelihoods, they considered the actions of their ecological farming neighbors to be benign at worst.

This sense of appreciation and investment in the local community was another aspect where ecological and industrial farmers often overlapped. Although some of the larger industrial farmers ran operations that spanned over several towns and even counties, they typically stayed within a relatively circumscribed geographic area. The large equipment necessary for industrial agriculture is inherently limited in the logistic and economic feasibility

of long-distance transportation. As such, even large-scale farmers tend to be centrally located in order to maximize their efficiency. Of course, this is also true of the smaller industrial farmers and certainly true of the ecological farmers.

This rootedness in a particular geographic location is another aspect that makes farming a unique enterprise in modern society. Particularly in the context of a mid- and post-pandemic work environment in which many white-collar employees were able to work from anywhere, farmers remain firmly attached to particular pieces of land. As a result, in addition to having multiple generations invested in a farm, many farmers also have multiple generations invested in local communities. Farm kids play on high school baseball and softball teams and participate in 4-H fairs, farm parents donate money to local causes, and farm families attend churches and serve on local governing bodies. The value that many ecological farmers had for investing in and providing food for their local communities was shared by industrial farmers who have several generations of investment in those same communities.

The flip side of such investment in local communities is a distrust of outsiders. There is a populist streak running through all the farmers I interviewed for this project. Whether they are distrustful of the meddling hands of government bureaucrats or the increasing and insidious power of large agribusinesses, farmers tend to keep their friends close and their enemies distant. Perhaps more accurately, the farmers I interviewed for this project counted those who were geographically close to them as friends, even if they disagreed on political issues, and were distrustful of distant power structures and those who ran them.

For industrial farmers, this typically came in the form of resistance to environmental regulations and taxes. For ecological farmers, the equivalent resistance was mostly to the corruption of large agribusinesses as well as the seepage of such corruption into the halls of government. Whatever the particular form the distrusted entity took, farmers sought the comfort and control of their local surroundings over the vague but sinister power of distant entities.

One particularly universal form this took was a distrust of the media. For several farmers across the spectrum of agricultural practice, the media can be blamed for much of the supposed political polarization happening in the United States. As Mark put it, "I think a lot of people are just trying to do what's right but when you turn on the TV, it's like the world has lost its damn mind!... But they just want you to keep watching." In this sense, Mark and his friends who farm under the logic of industrial agriculture might disagree with some of the sentiments of ecological farmers, but their differences are actually fairly minor. Rather, Mark and several others thought that the media had an interest in perpetuating a sense of political division and polarization in the United States. Although there remained important disagreements between opposing sides of the political spectrum, these farmers thought that the emotional intensity of such polarization could be attributed to a small minority in the country that was subsequently fomented by a media industry that benefits from such discontent.

It is not clear that these overlaps represent significant pathways for mutual reconciliation and future cohabitation. It is certainly not clear that any points of agreement between ecological and industrial agriculture can be easily leveraged by individuals seeking to further the interests of either agricultural logic. Rather, we must understand the points where



the logics of ecological and industrial agriculture overlap in order to better understand the current period of relative positioning in the field. If the future brings a new articulation of relative power and dominance of the logics of ecological and industrial agriculture, it is certainly the case that these dynamics will play a role.

### 3.3.3 Summary: Overlaps & Fragmentation in the Polarization

Political polarization in the United States is a powerful force. As the previous sections have shown, oppositional politics were the source of some of the most strongly-worded quotes from both ecological and industrial farmers. In today's politics, voters are motivated as much by their opposition to particular parties, policies, and politicians as they are by their support for any of the same. What I hope to have demonstrated in this last section, however, is that the narrative of polarization fails to explain everything.

On the one hand, the polarization narrative fails to account for the extent to which each supposed pole is fragmented within itself.. The contours of the fragmentation within each pole reveals important factors to consider in agricultural politics. In particular, the politics of ecological farmers encompass quite a wide range. Despite the frequent connection between the logic of ecological agriculture and progressive politics, the ecological farmers who participated in this study demonstrated that the logic of ecological agriculture is compatible with a range of political perspectives. Likewise, we also saw that the logic of industrial agriculture has the ability to contain a range of political perspectives within it. Although the majority of industrial farmers supported conservative Republicans, the particular level and shape of such support varied significantly.

On the other hand, the polarization narrative also limits one's perspective on the extent to which the logics of ecological and industrial agriculture have overlapping political ideas. Farmers of all varieties find themselves to be outsiders in a world dominated by modern sensibilities. Whereas the daily activities of most white-collar workers are largely removed from the demands of nature, farmers are utterly dependent upon the cycles and vagaries of the natural world. In addition, as the providers of food and fiber for the rest of society, te farmers take their role in society quite seriously. As such, both ecological and industrial farmers value the community that surrounds them and are often distrustful of distant authorities, whether governmental or corporate.

The implications of such nuances for the future of agriculture are important. As discussed, it seems unlikely that the logic of ecological agriculture will become dominant in the near future given the varied interests and perspectives of ecological farmers. However, the fragmentation of industrial farmers, particularly between large and small to medium-sized industrial farms may be an important leverage point to spread the logic of ecological agriculture. Whereas larger industrial farmers are fully invested in the logic and politics of industrial farming, some smaller industrial farmers may be able to be recruited to utilize the logic of ecological agriculture. Furthermore, progressive movements might consider reaching out to populist farmers as a method to build a constituency in a traditionally conservative base. Conversely, conservative leaders could build up on the populist leanings of ecological farmers in order to build their own constituency to include health- and environment-conscious growers.

These findings also have implications for the theory of institutional logics. As we saw in Part One on the epistemic foundations of institutional logics, an oppositional logic can

sometimes serve to support the dominant logic in an institution. Likewise, the political battle between progressivism and conservatism in the context of American agriculture serves in some ways to strengthen the hold of the dominant institutional logic. By aligning (somewhat loosely) with the progressive end of the political spectrum in the United States, the logic of ecological agriculture gains both allies and enemies. Indeed, given the rather tenuous connection between the progressive political movement that supports a shift toward ecological agriculture and the actual farmers practicing ecological farming techniques, it is difficult to see a radical shift happening in the near future. That the existing political fragmentation among industrial farmers seems to also support the continuation of the status quo also makes substantial changes to the dominant agricultural system seem unlikely.

Of course, this conclusion presumes relatively stable ecological conditions. As I have pointed out, farming is ultimately dependent upon the natural environment in a more direct way relative to most other modern professions. Dramatic climactic changes due to global warming and other ecological shifts would certainly generate significant change within the field of agriculture. To be sure, if such changes do occur, we can expect almost all of life to be changed dramatically.

# Chapter 4: Economics

In seeking to understand the lives of farmers, one must keep firmly in mind that the primary realm in which farmers operate is the economic. That is, for farmers, farming is always a business, a job, and a source of income. Whether operating under the logic of ecological or industrial agriculture, the farmers who agreed to be interviewed for this study all grow food and fiber in order to sell them in some form of marketplace. Although much of what this project has explored is the way in which the particular agricultural logic a farmer operates within also comes to define them outside of the economic realm (including in their roles as epistemic and political actors), we must also recognize the considerable constraints imposed upon farmers by the economics of agriculture.

The constraints of economics act upon both ecological and industrial farmers. Almost all of the farmers that were interviewed for this project mentioned the financial difficulty of being a farmer. Long hours of hard labor are rewarded with razor-thin margins and constant fear of financial insolvency. The manifestations of such difficulties and the solutions to them were radically different for industrial and ecological farmers. The logic of industrial agriculture is accompanied by a (theoretically) free market economic system that is characterized by the global trade of agricultural commodities. Competing on the international scale, industrial farmers are forced onto a financial treadmill where massive loans encourage investment in increasingly large equipment, which require further loans, perpetuating the cycle. Conversely, the logic of ecological agriculture is characterized by a community-oriented economic system wherein the locality and environmental benefits of the production process of agricultural

products create a higher value for customers. For ecological farmers, higher prices and lower marketing costs are counterbalanced by smaller production volumes and geographic market scope.

Although the economic systems of the respective agricultural logics are perhaps the most markedly different of any of the systems discussed in this project, they are also the least defined by oppositional forces. The farmers for this project were not such much opposed to the economic system of their counterparts as they were ignorant or uninterested in them. Whereas ecological and industrial farmers were highly critical of the epistemic and political systems of the opposite agricultural logic, they all recognized the necessity and value of a farm's profitability. As one farmer put it, "I never begrudge anyone making a buck." Indeed, many farmers were particularly reluctant to criticize the profitability of other farmers because they recognized the difficulty of the task at hand.

The structure of this chapter will mirror Parts 1 and 2. The first section will explore the economic practices and discourse of industrial farmers, with a brief section on the extent to which industrial farmers discussed the economics of ecological agriculture. The second section will then explore the practices and discourse of ecological farmers on the topic of economics before likewise briefly touching on ecological farmers' discussion of industrial farming economics. The conclusion will discuss the variations in each pole as well as the potential for shared knowledge.

## 4.1 Economics within the Logic of Industrial Agricultural

In some ways, the logic of industrial agriculture is shaped around the economic logic that has come to dominate the global economy at least since the fall of the Soviet Union. Since the 1980s, the world's advanced industrial economies have been dominated to varying degrees by neoliberal economic and political thought (Harvey 2005). Anti-regulatory and pro-market policies have contributed to the globalization of the world economy. Such developments have been centrally important for American industrial farmers.

My goal here is not to examine the currents of neoliberalism and globalization and their effects on American industrial farmers. Rather, I seek to discuss the ways in which the particular economic system in which industrial farmers find themselves comes to define the practices and discourse of the farmers for this project. Industrial farmers understand that they are operating within a global agricultural economy in which even the largest of farmers remain but a tiny player. Through techniques including careful grain marketing<sup>31</sup>, savvy use of credit instruments, and vertical integration, the industrial farmers who took part in this study sought to position themselves within the massive global agricultural economy in such a way that they avoided being crushed by the uncaring weight of it. In their discussions of this economic system, industrial farmers used a historical lens to discuss their role in the international agricultural economy and highlighted the importance of hard work and smarts in being successful in today's agriculture.

---

<sup>31</sup> Industrial farmers often use the term "marketing" to refer to the strategies they use to sell their crops. That is, the term refers to putting the grain on the market, as opposed to advertising and PR, as it is typically used outside of this context.

#### 4.1.1 Economic Practices of Industrial Farmers

For industrial farmers, farming is a lifestyle and a business. The industrial farmers for this study ranged in their level of financial success, but none was under the impression that they would become fabulously wealthy. Rather, they utilized every tool at their disposal in order to continue making their farms profitable. Whereas some were successful, others were on the verge of financial insolvency. Indeed, all the industrial farmers mentioned the difficulty of remaining profitable as an industrial farm and the frequency with which farms in their area end up selling off their land and assets.

The methods that farmers use to remain profitable are complex. In fact, many of the industrial farmers argued that the difficulty of grain marketing, making large financial decisions, and running a business with sometimes dozens of employees should demonstrate to non-farmers the intelligence necessary to make a living as a farmer. In addition to valuing the hard physical labor and long hours of farming for all members of farm families, the farmers also valued the economic savviness and know-how they thought was necessary to make a buck as a farmer.

#### *Grain Storage and Marketing*

Perhaps the most complex aspect of modern industrial farming is grain storage and marketing. Because most industrial farmers in the United States harvest in the autumn, prices during that season are typically at their lowest of any time during the year. With the supply of grain at its yearly high and demand staying relatively constant, prices can drop dramatically in the late fall

and early winter. For farmers who have the capacity to store large quantities of grain, however, this yearly price minimum can be avoided.

For anyone who has driven through the farm fields of middle America, grain bins like the ones shown in Figure 1 will be a familiar sight. Typically made of corrugated silver steel, these large, wide cylinders with peaked roofs<sup>32</sup> can range in capacity from several thousand to over a million bushels. Farmers with the means will typically pair grain storage bins with large dryers. Although drying can become a significant expense in its own right, the process is necessary both for the long-term storage of the grain and because farmers are docked a percentage of the sale price of the grain if they bring in grain that is too high in moisture.



Figure 3: Grain Storage Bins

---

<sup>32</sup> Not to be confused with silos, which are tall and skinny with domed roofs and are typically used to store silage or other fermented animal feed.



Farmers without storage or the ability to dry their own grain are thus at the mercy of grain buyers. I spent time with Derrick, who works for an operation that buys some grain from surrounding farms in addition to harvesting their own grain. When a father and son came in with a small load of recently-harvested corn, he told me he felt bad for them.

These guys don't have bins or dryers and, honestly, most of their equipment is pretty shitty... The son told me they needed to sell this grain in order to buy a part for their combine so they could harvest the rest. But it's going to test terrible and they're not going to get hardly any money for it.

Derrick's mention of the test is a reference to a quality measure that grain must undergo before purchase. The standard "test weight" of corn, for example, is fifty-six pounds per bushel. This test stands in for a variety of grain quality measures including kernel density, any damage to the corn, as well as overall quality. Corn that weighs fewer than 56 pounds per bushel is docked in price. In addition to having lower quality corn, the father and son's corn was also high in moisture, incurring them an additional reduction in the sale price of their corn.

This interaction with Derrick and the father and son farming team laid out a number of principles for industrial farming as it relates to grain storage and marketing. First of all, the lack of storage of the father and son team meant that when they had to sell their grain, they had to do so at the price dictated by the organization that Derrick worked for. Secondly, the lack of storage for the father and son also coincided with a larger lack of quality equipment and capital resources. The low quality of their equipment likely contributed to the low quality of the grain itself, as damage from poor harvest machinery can lead to low test weights. This problem was

then compounded by a lack of the financial resources necessary to purchase replacement parts. Combined with a lack of storage and drying capacity, the father and son team were forced to sell low-quality grain at below market price in order to fix “shitty” machinery that would likely harvest more low-quality grain.

Many farmers recognized the importance of grain storage. When I spoke with Aaron, he told me that one of the best investments his family had made was in grain storage bins at several locations around their farm. With the capacity to store most of the harvest of a given year, his family is then able to sell the grain when the price is more favorable.

Storage is one of the best investments you can make. With our bins, we can take almost all of what we harvest and keep it until we want to sell it... If we didn't have that, we'd have to sell it to ADM at whatever the price is that they're offering when we harvest it.

By having bins to store grain in, Aaron's family is able to market their grain when it is advantageous for them. In a way, this also removes a layer of dependence that farmers have upon nature. By harvesting grain, drying, and storing it, farmers ensure that the grain can be used for its intended purpose. Today, the intended purpose of the grain (for the industrial farmer at least) is to sell the grain as a commodity. Rather than being entirely beholden to when the weather allows them to harvest and sell their grain, storage allows farmers to harvest grain when the weather permits and sell it when it benefits them financially.

In addition to storage bins, industrial farmers also used financial instruments to smooth out the cycles of nature. Indeed, some of the first financial instruments invented were

agricultural commodity future contracts. The intention of futures contracts (in the context of farming) is for the buyer and the seller to agree upon a price of a commodity in the future.<sup>33</sup> That is, farmers can sell the grain that they will harvest in the future at an agreed upon price today. For example, if a grain buyer thinks in May that the price for a bushel of corn in December will be \$5.00, but the price today is \$4.25/bu, the buyer can write a future contract with a seller to buy 10,000 bu of corn in December for \$4.75. Come December, the buyer gets 10,000 bu of corn and pays \$47,500 for it. The buyer can then turn around and sell the corn for the current price of \$5.00/bu and make \$2,500 in profit or turn the corn into various products like corn syrup, ethanol, or animal feed, having saved the \$2500 in purchase price.

This practice lowers the risk for both the buyer and the seller. For sellers (the farmers), prices can be locked in at a value that guarantees profitability. Industrial farmers know their costs per acre and can estimate their bushels per acre, therefore approximating the price they need per bushel in order to be profitable. Furthermore, the buyer mitigates the risk that the price of corn will increase beyond the point at which the products they make using the corn will be profitable. Of course, the buyer and the seller can also miss out on profit if the price of corn goes down or up, respectively.

For the industrial farmers, futures contracts were essential for maintaining profitability. Most of the industrial farmers I talked to (fifteen out of twenty-six) used commodity futures simply to make sure their harvest would be profitable. When I spoke with Danielle, she said her family paid attention to the futures market, but did not try to out-smart it:

---

<sup>33</sup> This is a simplified version of agricultural commodities trading.

We watch the [Chicago Mercantile Exchange] and the basis at ADM, but it's never a good idea to try to outsmart those guys. It's like gambling—the house always wins. But when it gets to a price that we know we can make money, we try to lock that in.

For Danielle and her family, trying to play the game of commodities futures is a risk they are not willing to take. The reference to the “basis at ADM” and the Chicago Mercantile Exchange (CME) are the two points of reference for the price of grain futures. The price of a given commodity future is traded at the CME and provides a foundational price point for futures contracts. The basis at a local grain elevator (like the ADM location near where Danielle's family lives) is the difference between what the price is at the CME and what the grain elevator will pay for grain. For instance, if the local elevator has a lot of futures contracts for a given period and thinks they have more than enough to meet the demand it will have at that time, the elevator may have what is called a “negative basis,” indicating that it will pay less for the future contract than what the contract is trading for on the CME. Conversely, if a grain elevator thinks it will need more grain at a future period than it already has schedule for delivery, the price will have a positive basis, indicating that the elevator will pay more for a future contract than what it is trading for on the CME.

The point that Danielle makes is that the people making decisions on the CME and at local grain elevators are like gamblers. Traders and grain elevator operators take in vast quantities of information in order to make decisions on what they think the price of a commodity will be in the future. According to Danielle, the house always wins in this game. Rather than seeking to outsmart the grain elevator in order to make the most money possible,

Danielle and her family simply wait for a time when the future contract is profitable for them. By locking these contracts in, they might lose out on some profit, but make sure they will make some money at the end of the year.

A minority of the industrial farmers that were interviewed for this project engaged in more speculative trading in commodity futures. For most of the people engaged in commodity futures market, no actual corn ever changes hands. Rather, speculators and traders make money on the movement of the value of the future contract over time, settling profits and losses in cash. Eight of the industrial farmers for this study engaged in this form of commodity speculation (the remaining three industrial farmers did not discuss futures contracts). These farmers argued that by being a farmer themselves, they had access to valuable information not available to the traders on the CME.

When I talked to Aaron about futures trading, he was enthusiastic about how recent trade he had made contributed to the goals of the farm:

Made a big move a couple of weeks ago that pretty much paid my salary for the year. It's not that hard when you're watching what's going on. We've got eyes on the ground that other people don't have. When I can use that and make money [on the exchange], that's good for us.

For Aaron, speculating on the commodities market made sense. To him, being a farmer on the ground gives him an information advantage when dealing with other traders and speculators. By making big financial moves in the futures market, he was able to contribute significantly to

the goal of his family farm, paying his own salary and allowing more capital to flow into the organization.

In summary, grain storage and marketing strategies give farmers valuable tools in their business arsenal. By drying and storing grain, the agricultural product becomes removed from being a plant product grown in the course of natural cycles to an abstracted commodity with various quality measures and quantity scales. Futures contracts further abstract the agricultural product by selling it as a commodity before it even exists in the real world. Although some farmers speculate on the commodity market in order to maximize their profit, many simply use futures contracts to ensure the profitability of their farms. Importantly, however, the ability to take advantage of these measures depends on the already-existing capital capacity of a farm operation. Without the capital necessary to invest in storage, farmers are at the mercy of the local grain buyers. Furthermore, without the necessary capital to take advantage of futures trading, farmers are limited in their ability to maximize their profit. As such, in the world of industrial agriculture, farmers with more capital are more able to remove themselves from the natural cycles of farming and play the game of international agricultural economics.

### *The Financial Treadmill*

In addition to the use of grain storage and marketing in order to maintain profitability, industrial farmers also discussed their dependence on sizable loans from banks that specialize in providing financing for industrial farms. These loans provide farmers with the financial capital to make equipment purchases and land acquisitions and to pay for operational expenses. For many farmers, these loans make it possible to farm at the scale necessary to maintain

profitability in the world of industrial agriculture. For others, agricultural loans are part of a financial treadmill that lock farmers into an expansionary mindset and poor agricultural practices. Of the twenty-six industrial farmers I interviewed, ten talked about bank loans.<sup>34</sup> Of the ten, seven were mostly happy about their dependence on such loans. The remaining three were highly critical of this system.

The seven industrial farmers who were generally supportive of agricultural loans discussed the ways in which they were able to grow through the credit extended to them by banks. For example, when I talked to Randy about going from working part-time on his family farm to working full time, he said:

When I came on, me and my uncles had to work with GreenStone to do a little expansion. I took on a lot of the responsibility for paying off the loan, but I think I've helped us to grow and keep us going into the future.

Headquartered in East Lansing, GreenStone Farm Credit Services is one of the main providers of agricultural loans in Michigan. In this case, the loan from GreenStone allowed Randy's family farm to expand in order to make room for Randy to work full time on the farm. Before making this move, the farm was large enough to provide enough income for two of Randy's uncles. With Randy coming on full time, the farm needed to expand in order to provide for more people. By using the credit extended to them by GreenStone, Randy's family bought some additional land and planned to rent more. In addition, they bought several pieces of new

---

<sup>34</sup> The fact that only ten farmers discussed the importance of agricultural loans does not indicate that the remaining farmers did not use these loans. Rather, the farmers that discussed agricultural loans were simply more willing to delve deeper into the finances of their farm.

(Randy was sure to say that it was actually used) equipment to service their expanded farm.

Clearly Randy felt the pressure of paying back the loan, as it was taken out for him to work on the farm, but Randy also thought that his work on the farm to that point had justified the loan.

Whereas the loan that Randy's family took out was part of a family decision to expand the farm, other cases were more acrimonious. Indeed, when dealing with multi-million-dollar loans and farm assets, the bonds of family can be tested. This was the case for Jerry, who collaborated with his brother to get a loan in order to buy their uncles out of the family dairy farm. After the passing of Jerry's grandfather, the farm passed into the hands of his father and two uncles. Jerry and his brother had both worked full-time on the farm since graduating from trade school and had expressed interest in taking over one day. After years of in-fighting among the family, the two uncles demanded that Jerry and his brother either buy them out of the farm or find alternative employment. The loan necessary to make such a purchase was at the very limit of what Jerry and his brother could get:

We had to go back and forth a bunch because, you know, it's not like me and [my brother] have a super long history of making boatloads of money. But the farm has done reasonably well, so we were finally able to get it. Thank God, too, because I don't think we could have stood another year with [my uncles].

Without the loan, Jerry and his brother would likely have been forced to explore careers outside the farm, a scenario that was abhorrent to both of them. After dedicating much of their young lives to the farm, they were committed to continuing their lives as farmers. Although the



loan they were able to attain stretched their financial resources, they were ultimately happy about the lifestyle and business opportunities it afforded them.

As we have seen, the extension of credit to farmers can facilitate the ventures that farmers wish to pursue. However, what is also clear is that after taking out such loans, these farmers felt the immense weight of such financial obligations. For three of the industrial farmers who talked about farm loans, these downsides far outweigh the benefits. For these farmers, large farm loans lock farmers into a spiral of debt and expansion that is difficult to escape. For example, Benjamin said that after watching the experience of several farmers in his area, he preferred to stay away from big loans:

I've seen guys around here get big loans, go out and buy themselves a big ol' tractors, more land, whatever. Then you watch a couple years later, and you see that big tractor for sale and that guy's not farming anymore—went bankrupt...

The point that Benjamin makes is that farm loans can encourage farmers to expand their organization perhaps beyond their ability to farm it profitably. Benjamin went on to say that he preferred to expand slowly in order to “keep things balanced.” For him, by buying tractors and additional land through large loans, farmers can find themselves in a situation in which the cost of farming goes beyond the point of profitability.

In addition to arguing that large loans can create an imbalance in a farm's balance sheet, one industrial farmer commented that his freedom would be restricted by taking out a line of

farm credit. For Mark, the farmers who take out large lines of credit are forced into farming in a very conventional manner. Without such restrictions, he is able to be more experimental:

If we want to start planting sweet corn or pumpkins or lavender, we're just going to go ahead and do that. These guys who take out huge loans can't do that. They have to keep planting whatever the bank tells them is going to be profitable... We can do whatever we want because we don't have those big loans.

For Mark, this sense of freedom was more important than the possible increased income of expanding through bank loans. By taking out large loans, Mark argued that his fellow farmers were committing themselves to whatever form of farming that the bank thought would be the most profitable. Without such obligations, he argued that he was free to explore a wider range of options. Indeed, Mark's family farm was perhaps the most diverse of all of the industrial farms I visited.

Of course, the perspective shared by Mark and Benjamin was the minority opinion of industrial farmers. Mark and Benjamin also voiced the most common criticism that ecological farmers had of industrial agriculture. For the ten industrial farmers who used and supported farm loans, such financial instruments were essential to flourish in the economy of today's industrial agriculture.

### *Diversification & Non-Farm Income*

Another practice that farmers mentioned as a way to deal with the difficulties of competing in today's industrial farming economy was the diversification of their enterprises to vertically

integrate their operations as well as to include non-farm methods for making money. One method of vertical integration, investing in grain bins, was already mentioned. In addition, several farmers also opened businesses selling agricultural inputs including chemicals and seed. In this way, they were able to purchase their own inputs at wholesale prices and use their farming acumen and networks to sell inputs to their neighbors. These farmers were also able to hire specialized, full-time employees in order to minimize the costs of running a large agricultural operation and maximize the value of expensive farm equipment. Furthermore, by investing in non-farm enterprises such as real estate, long-term storage, and junk removal, several of the industrial farmers were able to utilize the skills and materials of farming to generate non-farm income.

The vertical integration of a farm operation to include input sales was not particularly common among the participants of this study. Only six of the industrial farmers I interviewed were dealers in agricultural products in addition to operating their own farms. For these industrial farmers, vertical integration was about minimizing risk as well as increasing their profit. For example, when I asked Gary what the benefits were of owning a chemical and seed dealership, he said:

Well obviously, it expands the things we're making money from, which is nice. But the bigger thing for us is if the price of a chemical goes up, we don't get screwed by that. I mean, we're going to lose money when we buy it for ourselves, but at least we're going to make a little of that back when we sell it.

For Gary and his family, selling agricultural inputs both represents an additional stream of income and a mitigation of risk. Once again, of course, this requires a substantial amount of financial resources that not all farms have access to.

Another aspect of diversification was full-time workers for particular tasks such as maintenance, chemical application, and even harvesting. For smaller industrial operations, farmers must hire others to fix their equipment when it breaks beyond the ability of the farmer to fix it themselves, to apply pesticides and fertilizers, and sometimes to harvest their crops. Whereas large industrial farms have the capacity to factor these costs into their operations, the costs eat directly into the profit of smaller farmers. For example, with a full-time staff of nearly twenty people, Larry's farm is able to incorporate all of their operations under a single business. I asked how they had come to this arrangement, and he had this to say:

We've built that over time. A lot of those guys have been with us for, shoot, like fifteen or twenty years. We say, "boy, it'd be really nice to have someone to just fix the combine rather than having to call in John Deere," or, "man we could use a full-time sprayer," and we've slowly built those guys up... We have them do other work when they're not doing those things, but it's ended up cheaper that way.

In addition to the cost savings for the farm itself, hiring specialists can also be a separate source of revenue. Such specialists typically operate complex agricultural machinery such as planters, sprayers, and harvesters. Once Larry's employees are done on Larry's

fields, other farmers in the area often pay Larry for chemical application or harvesting services. This way, the equipment gets more use and continues to make money for the farm during the period in which it is useful.<sup>4</sup> In addition, the specialized skills of Larry's employees contribute to the profitability of the farm beyond the farm itself. For Larry, in-housing the various necessities of a farm operation allows him to manage the costs of his farm while generating additional revenue streams. Of the twenty-six industrial farmers I interviewed, twenty employed full-time staff outside of the family. On the low end, six of these farmers had only one or two extra hands, whereas on the high end, Larry and four other industrial farmers all had twenty or more employees on their farm. The others fell somewhere in between, and all of the industrial farmers I interviewed hired seasonal labor to achieve particular tasks at various times of the year.

In addition to vertically integrating farm operations, the industrial farmers also relied upon non-farm income to supplement the intake from farm activities. Of the twenty-six industrial farmers interviewed, fourteen said that their farm income was supplemented with non-farm enterprises. In the next section, I will explore the contribution of off-farm labor of farm spouses to the financial viability of farm operations. Here, I will continue with the theme of extending the value of farm assets beyond their application on the farm itself.

For example, of the fourteen farmers that supplemented farm income with other enterprises, eight were heavily invested in various real estate projects. In these projects, farmers were able to utilize skills and tools necessary for farming to make money outside of the agricultural context. For example, Linda's family owns several rental properties and is working

on renovating two additional houses in order to rent. For Linda, these renovation projects represented useful ways to keep employees busy during downtimes in the farming season:

It keeps the guys busy. Between planting and wheat harvest in the summer and for most of the winter, there's not a ton of farming to be done so we send the guys to work on some of our properties. We know they're good with their hands—that's why they work for us.

By investing in real estate, Linda and her family both expand the number of revenue streams coming into the farm and utilize the tools they already have at their disposal. Since Linda and her family require their employees to be “good with their hands,” in order to work effectively on the farm, they are also exactly the type of employees who work well in the context of home renovation. Again, the cycles of nature mean that there is significant downtime for industrial farmers and their employees. By investing in real estate, industrial farmers are able to diversify their revenue stream while utilizing the skills and assets already at their disposal.

In addition to real estate, two of the industrial farmers are involved in junk removal. Utilizing the trucks and other equipment they already used for agricultural purposes, these farmers get paid to collect whatever refuse a customer wants to get rid of and haul it away. When I asked Mark how his family had gotten into this business, he also mentioned the use of farm equipment outside of their usefulness on the farm:

Well, over time you accumulate some stuff, right? Some of that stuff is useful. We got a truck to haul grain. Well, hook a different trailer on the back of it and you can haul whatever you want. We just figured out that if you don't

mind getting your hands dirty, you can make some good money hauling people's junk.

Once again, although the original purpose of equipment was for farm use, enterprising farmers find ways to use it outside of the agricultural context. For Mark, the multi-functionality of farm equipment makes easy sense. In addition, what Mark makes clear is that the mentality of farmers also helps in this arena. Being an industrial farmer already means that you are going to get your hands dirty. For Mark and his family, there does not seem to be a significant difference between getting one's hands dirty on the farm and getting them dirty while getting paid to haul away someone else's junk.

In order to make money as an industrial farmer, diversification is key. Within the agricultural context, farmers can expand both up and down the supply chain, storing grain once it becomes a commodity and selling agricultural inputs to their neighbors. In addition, using on-farm assets to make money outside of the farm is an important aspect of profitability for many farmers. This can be within the context of industrial farming, as when farmers sell agricultural services to their neighbors in order to make use of employee know-how and agricultural equipment. It can also be outside of the context of farming, as many of the skills and tools of farming have value outside of the industry, such as the handiness necessary to renovate a house, the equipment necessary to haul junk, and the mentality necessary to get one's hands dirty to make a buck.

*Keeping it in the Family*

In addition to using equipment and employee assets to support the income on the farm, industrial farmers also maximize value from family members to support the continued profitability of the farm. The two areas this came up were spouses who worked off the farm and the value provided to the family farm through the labor of family members.

Six of the industrial farmers discussed the value of spouses who worked off the farm. All of the farmers in this group were men whose wives worked outside of agriculture. For these farmers, the supplemental income of non-farm work allowed the farm to continue. As Eric put it, his wife's work as a nurse kept the farm in business:

We've had some tough years here where I thought we might have to sell and I'd have to get a real job! [My wife]'s job is steady, and she makes good money. I probably would have needed to get a real job if she didn't have one. I give her so much credit for that.

Eric's goal of working on his family's farm was almost dashed during a run of bad weather, low prices, and some bad decisions. With his wife's income, his family was able to continue living and working on the farm until their fortunes turned around. The gender dynamics of this situation are quite marked. All six of the men whose wives worked off the farm told me so with a mix of gratitude and inadequacy. On the one hand, they were sure to emphasize that they felt grateful to be in a partnership in which both spouses contributed to the success of the family. On the other hand, many of them grew up with stay-at-home moms, which remains common for the industrial farmers. The inability to fully provide for their family without requiring supplemental income from their wives' employment did seem to be a source of strain



for these industrial farmers. All of them recognized, however, that without the supplemental income, they likely would no longer be farming.

In addition to the financial support of off-farm spousal employment, four industrial farmers mentioned the importance of the entire family's commitment to the continued existence of their farms. Similar to the technique of import substitution, used when countries invest in local industries in order to keep money within the local economy, farm families try to keep tasks such as accounting, hiring, and employee management within the family in order to keep the expenses of such tasks from going outside of the family. Such tasks often fall on the wives and mothers of farm families. As such, despite the typical understanding of agriculture as male-dominated, we see that the labor of women in agriculture is essential, whether that labor happens on or off the farm.

When industrial farmers discussed this topic, they were sure to highlight how much they appreciated their wives and mothers for the work they did to contribute to the farm. These farmers recognized that the labor of the women on their farms allowed them to do what they considered to be the more exciting parts of farming. For example, Thomas said:

[My wife] takes all of the orders and sends us to where we need to go. I'm so glad she does that because I can't stand that sort of thing. I'd so much rather be on the tractor, in the field, stuff like that.

From Thomas' perspective, we see that for the industrial farmers who mentioned the value that their wives and mothers, a main benefit was that the farmers themselves were free from

worrying about the details of collecting orders, running logistics, and other administrative duties.

Although Thomas was the only industrial farmer to speak explicitly about the specific on-farm tasks performed by women on the farm, three others alluded to appreciating the work of “farm moms and farm wives.”<sup>7</sup> In addition, I know of one other family of farmers in which the wife/mother plays a crucial role in running the accounting and hiring of the farm and who runs multiple non-farm enterprises for the family. Of course, the tasks accomplished by wives and mothers to this point are all understood to be “labor” in the sense that by keeping it in the family, farmers are alleviated the need of paying an outside professional to do it. Women who live in farm families also contribute to the financial longevity of farms through their roles as “farm moms and farm wives.” Although most of the interviews I had with men industrial farmers did not mention the role of women, none of them would be able to pass down their farms to their children without the labor of caring for children, grandparent, and other traditional “women’s roles” that are performed by their wives and mothers.

Of course, not all the industrial farmers I interviewed were men. The women who practiced industrial farming all recognized the importance of women in their field. As mentioned in the section on politics, although several of the women in the sample of industrial farmers embraced traditional gender roles, all contributed to the profitability of the farm in unique ways. Of the eight women in the sample who were involved in industrial farming, three had full-time jobs outside of their family’s farms in the realm of industrial agriculture. In each of the three cases, these women had husbands, fathers, or brothers who worked on the farm full time. For example, after growing up on her family’s small farm, Erica married into a larger farm

family. Erica was passionate about agriculture but chose to work for an agricultural lobbying group rather than on the farm itself. When I asked how she had gotten into her line of work, she had this to say:

I grew up around farmers, I married to one. I love farming. But I'm not into driving tractors and that sort of thing... I like being behind a desk, but I like to think I'm contributing to doing the same thing.

For Erica, working "behind a desk" means she can contribute to her family's farm and to farming in general while not doing the daily labor required of farmers.

For the other five women that were part of the sample of industrial farmers, working directly on the farm constituted at least part of their employment. However, to my knowledge, none of these women were primarily employed, as Erica put it, "driving a tractor and that sort of thing." Rather, women like Danielle and Cassy had full time, non-agricultural jobs in addition to contributing substantial labor to their family's farm. In addition, all five of these women were involved in somewhat atypical farm work. For example, Sally and Tonya both ran industrial horticulture operations growing blueberries and apples, respectively. Indeed, although the operation that Linda worked for largely consisted of industrial row crop farming, she was mainly in charge of running the local sales of straw, coordinating logistics, and only occasionally stepped in to run harvesting equipment.

Although industrial agriculture is largely dominated by men, it is important to keep in mind that these are almost always family affairs. Whether through securing outside income by working at jobs outside of the farm or by preventing the farm from losing money

through performing necessary labor, the women who live and work on family farms are essential to their continued existence.

### *Summary of the Economic Practices of Industrial Farmers*

For industrial farmers, working in agriculture is not just a business, but a valued lifestyle. The strategies discussed in this section give farmers the opportunity to continue working and living their lives as farmers. In the world of industrial agriculture, margins are often narrow, and farmers employ every method they can think of in order to continue working as a farmer.

Some of the methods for staying profitable as an industrial farmer involves the agricultural commodities themselves. By investing in grain storage, farmers benefit in multiple ways. Firstly, they are able to sell their harvested product when it suits them, rather than being at the mercy of grain buyers and natural harvest cycles. In addition, with the ability to dry and store grain, farmers are able to extend their enterprise into multiple parts of the supply chain in agricultural commodities. These benefits are extended further through the use of futures contracts, which likewise “even out” the natural cycles of agricultural production, allowing farmers to lock in prices when they know they will be profitable.

In addition, the industrial farmers sought to expand their enterprises beyond the business of planting and harvesting crops. Some expanded by selling agricultural inputs to their fellow farmers. By combining agricultural know-how and wholesale prices, these industrial farmers were able to limit their losses in the case of increased input prices while adding an additional revenue stream. Furthermore, whereas some industrial farmers lacked the capacity

to have a large full-time staff and specialized equipment, others saw this as a market opportunity. With specialized staff and equipment, these farmers were able to expand into farm services, getting paid by their fellow farmers to apply chemicals, plant crops, and even to harvest products.

The specialized skills and tools of farmers and farm employees were also used outside of the agricultural context. Some farmers expanded into real estate or junk removal in order to maximize the use of farm equipment and farm workers. The equipment and mentality necessary to work in agriculture also lend themselves to profitability in other areas, and the industrial farmers were eager for such opportunities.

Finally, it must be kept in mind that for the most part, industrial farms remain family operations. Although the industrial farming industry is dominated by men and my sample reflects this phenomenon, women play an important role in the persistence of family farms. Some support their families by taking jobs outside of the farm in order to provide financial support in down years. Others engage in a form of import substitution by performing necessary labor and saving the family the cost of outsourcing such work. The women who are included in the sample of industrial farmers each had a unique economic contribution to their families' farms. By working in agriculture but not directly on the farm, some of the women in the sample kept a passion for agriculture while contributing financially to their family's farm. Others worked jobs outside of agriculture while working on the farm. Still some others worked full-time on the farm but engaged in slightly atypical industrial farming such as horticulture.

In today's industrial agriculture, farmers must use every tool at their disposal in order to stay profitable. As we will see in the next chapter, farmers recognize the precarious situation in which they find themselves. Without the ability to set their own prices and competing on a global market, the industrial farmers had to seek every opportunity to continue making money in agriculture.

#### 4.1.2 Economic Discourse Among Industrial Farmers

In addition to understanding the techniques that industrial farmers use to maintain the financial solvency of their operations, it is also useful to understand the way that industrial farmers talk about these issues. Whereas the economic practices employed by industrial farmers reveal the ways that the global agricultural economy affects farmers on a local level, the discourse of farmers on these issues reveals the ways that farmers understand these systems and their role in them.

The remainder of this section will be structured into two major subsections. The first subsection will examine the discourse of industrial farmers regarding the constraints imposed upon them by global forces and historical trends. Industrial farmers recognized the constraints inherent in competing in a market influenced by forces as wide as geopolitical dynamics, global weather patterns, and crises including the COVID-19 pandemic. However, the second subsection will detail the ways in which farmers discuss agricultural economics in a way that gives themselves agency. Despite the challenges of succeeding in modern industrial agriculture, the farmers thought they had the resources and wherewithal to take such challenges on.

#### *U.S. Farmers in a Sea of Global Forces and Historical Trends*

When discussing the details of industrial agricultural economics, the farmers frequently recognized that even the largest farmers are small players on the global market. Despite the recognition of the global dominance of U.S. agriculture, industrial farmers acknowledged that the actions of South American and Chinese governments can have a powerful impact on their livelihoods. In addition, the industrial farmers pointed to historical trends as evidence of the challenges of modern farming. Whether these historical trends favored farmers or hurt them, the farmers thought that they had no control over them. Although farmers do their best to remain profitable, prices for agricultural commodities are affected by international trade agreements and disputes, history-shaping events. Ultimately, prices are dictated to farmers on the local level.

When discussing the role of U.S. agriculture within the international system, the industrial farmers frequently referenced the role of South America and China. Of course, the interviews were conducted during a particular period when the Trump Administration was fighting a trade war with China. Due to tariffs placed on American agricultural imports to China, Chinese buyers were purchasing more than their typical share of South American agricultural products.<sup>35</sup> As such, three industrial farmers mentioned that they saw South America as a competitor in the global agricultural market. For example, when I asked Todd what factors influenced the price of American agricultural commodities, he said:

---

<sup>35</sup> It is worth mentioning that the expansion of industrial agricultural production in South America (particularly Brazil) has contributed to the destruction of the Amazon rain forest, which is frequently cleared to make space for cattle.

There are so many factors involved in that. A big one is who's buying our products versus who's buying from South America. They grow a lot of soybeans and a lot of corn down there and when China isn't buying from us, they're going to them.

In Todd's example, he recognizes that the geopolitical struggle between the United States and China ultimately affects the prices of the crops he produces. Given the enormity of China's population, its demand plays a large role in the global prices of agricultural products. When South American farmers can step in to meet the demand vacated by U.S. farmers during the trade war, the prices of South American corn and soybeans might go up, but American prices do not.

The interaction between geopolitical struggles and the economics of industrial agriculture also ventured into the realm of environmental politics. For Jennifer, global environmental concerns needlessly impact American farmers. When discussing the benefits of ethanol, Jennifer said:

When I worked [for the corn industry], they were talking about these crazy ideas to look at the energy balance of ethanol. And because Brazil used ethanol, they were cutting down the rainforests in Brazil. And so [they said] that should be added to the energy balance equation for ethanol. And we were like, that's the most ridiculous thing we heard. Guess what? It got traction. It was. It is not a corn farmer in Michigan's fault that people are taking out the rainforests in Brazil; [we] really have nothing to do with it. But



when you add all of that to the equation, and the energy balance, it makes it not look good, right?

According to Jennifer, the inclusion of the destruction of the Amazon rainforest within the “energy balance” of ethanol ultimately hurt farmers in the United States unnecessarily. For her, industrial farmers in the United States should not have been penalized for the behavior of Brazilian farmers. However, given the global nature of the agricultural market, encouraging or requiring gasoline producers to include corn-based ethanol results in a global increase in demand for corn.

The industrial farmers recognized that these global dynamics are ultimately out of their control. Although almost all of the industrial farmers discussed the challenges of global agricultural production, none did so with any intention of having any sort of impact on such realities. As we saw in the section on politics, there were some farmers who thought that the Trump administration’s foreign policy work would ultimately benefit farmers. Others thought that the administration was fundamentally at odds with the interests of farmers. However, beyond voting for politicians who they believed would benefit American agriculture, the industrial farmers did not often think that they could influence the global market for American agricultural products.

One frequent way that the industrial farmers manifested this attitude toward their inability to influence the global market was the phrase, “we don’t get to set our prices.” Of the twenty-six industrial farmers that were interviewed for this project, nineteen used some version of this phrase. The point here is that the prices for agricultural products are dictated to

farmers, rather than negotiated. Grain buyers tell farmers what the prices are, and farmers can either choose to sell at that price or hold their grain if they think they can get a better price in the future and they have the storage capacity to hold it. In this way, the agency of industrial farmers is limited.

This perspective was put most dramatically by Randy. Randy's family has chosen to grow some non-GMO soybeans to sell to a particular buyer near their farm. When I asked how his family had come to that decision, he had this to say:

It's the only way we've ever come up with to get a premium price. Otherwise, you're just selling for whatever the buyer wants to give you. This way, we might have to do some things a little differently but at least we can demand a little higher price. At the end of the day, they're still telling us what they can pay for it, but at least it's not the bottom of the barrel like with the [genetically-modified] stuff.

According to Randy, much of the product of that buyer is sold to Japan to make soy-based products for human consumption. Because the buyer for their grain is relatively close, Randy and his family are able to take advantage of this price premium.

Industrial farmers fully understand their position within the global agricultural market. When compared to the aggregate behavior of millions of farmers in South America and at least that many grain buyers in China, the actions of any individual farmer in the United States are miniscule. As we saw with Randy, some farmers are able to take advantage of small price

premiums. For most industrial farmers, however, the reality is that whatever the market says the price is for agricultural products is the price their product will get.

In addition to being at the whims of the global market, farmers are also at the mercy of historic trends and forces. These trends can either hurt or help farmers. The three most frequently cited examples of historical events that affected farmers were the farm crisis of the 1980s, the financial crisis of the late 2000s, and of course the COVID-19 pandemic. Whereas the 1980s were universally understood to have harmed farmers, the latter two were more complicated. As consumers, farmers were as damaged as anyone else during the financial crisis. However, because the value of the dollar decreased relative to other global currencies and domestic demand remained more or less constant, the price of agricultural commodities increased. As far as the pandemic goes, farmers were indirectly affected by the decreased demand for fuel, which translated into less demand for corn-based ethanol. Whereas early interviews were quite pessimistic about the effect of the pandemic on agriculture (as many predictions were), later interviewees were more sanguine about the long-term economic fallout from the pandemic. If industrial farmers framed themselves as tiny players in a global game while describing international market forces and geopolitical developments, their descriptions of historical events and trends positioned them as merely trying to stay afloat on the waves of history.

The farm crisis of the 1980s was a complicated phenomenon on which we need only go into brief detail here. In the 1970s, the grain deal between the U.S. and the Soviet Union that came to be known as “The Great Grain Robbery” ended up decimating domestic supply and increasing prices dramatically. In response to high prices for agricultural commodities, many

farmers expanded their operations. In the early 1980s, partly as the result of a grain embargo imposed on the Soviet Union by the Reagan administration, prices for U.S. agricultural commodities dropped precipitously. Expanded capacity led to overproduction and many farms struggled to pay back the loans they had received in order to expand. This led to downward pressure on the price of farmland and ultimately to the failure of many farms.

The industrial farmers did not typically go into the details of the historic farm crisis of the 1980s. However, seven out of the twenty-six industrial farmers mentioned the 1980s as a sort of symbol of the whims of history and its effects on farmers. Four of these farmers were older and had lived through that period. Larry, who started farming in the early 1970s, brought up the topic when I asked how he had seen farming change:

Well, the eighties kind of changed everything. Before that, everyone around here was a farmer. A lot of those guys didn't make it through. We had to really tighten our belts and double down on the things that we were doing.

We were able to expand in order to... keep farming but not everyone did.

The way that Larry talks about “the eighties” is representative of the way that the older industrial farmers talked about them. The details behind the historic trends in the decade are not particularly important. The important thing was the way that the world changed around the farmers during that decade. Larry grew up in an era in which almost all of his neighbors were farmers. During the farm crisis of the 1980s, farms like the one that Larry's family runs expanded to stay afloat while others were forced to close. Like Larry, many of the other older

farmers referred to “the eighties” with a level of reverence appropriate for those having lived through a sort of trauma.

The perspectives of the three younger industrial farmers who mentioned the 1980s were slightly different from their older counterparts. Like the older generation, the younger farmers who talked about the farm crisis of the 1980s did not dive into the details of the historical causes and developments related to the event. Rather, they referred to the decade with a level of reverence for a decade that saw the closure of many a family farm. In addition, young industrial farmers like Aaron recognized that the farm crisis of the 1980s led to the consolidation of farms that continues today:

Everyone talks about how there’s fewer and fewer farmers but that started back in the eighties. Farms are going to keep getting bigger and there are going to be fewer farmers. That’s just how it is. That’s what you have to do to make it these days.

As we see in Aaron’s perspective, the consolidation of farms in the United States is beneficial for some. For farms like the one that Aaron’s family runs, the key is to stay on top of the consolidation game. But according to Aaron and others, the consolidation of farms is “just how it is,” at least since the 1980s. Although a farm family might be able to work to expand in order to stay ahead of curve of farm consolidation, they can never stop the process itself. For industrial farmers, the 1980s marks the beginning of an unstoppable process of the closure of family farms, the increase in farm size, and the decrease in the number of farmers.

If the farm crisis of the 1980s was seen by the industrial farmers as destructive for most (but not all) farmers, the financial crisis of the late 2000s and the COVID-19 pandemic of 2020 and 2021 were seen as mixed, if not potentially beneficial. Four industrial farmers referenced the financial crisis of 2008 as a unique time for farmers in the United States. Whereas many residents in rural America were suffering from job losses and mortgage defaults, farmers did relatively well during the financial crisis. According to Mark:

2008 was a weird time. A lot of folks around here lost their jobs. Lots of folk lost their houses. But people still have to eat, right? And since the dollar was down, everyone wanted to buy grain from us. So prices were pretty good and we made out alright even though everyone else was struggling.

Mark's assessment of the agricultural situation during the 2008 financial crisis shows the complications of agricultural economics. Despite the downturn of the economy as a whole, the agricultural markets remained relatively stable. As Mark points out, whereas demand for new consumer products might decrease as a result of lower incomes, people still need to provide food for their families. Furthermore, because the value of the U.S. dollar decreased relative to other global currencies, it became cheaper for foreign countries to buy U.S. agricultural commodities for import. As such, the global demand for U.S. commodities increased, raising prices.

The psychological effect of this dynamic can be challenging. The impact of the financial crisis was particularly hard on many rural communities. As Bill, one of the other industrial farmers who brought up the financial crisis said, "It's hard to see your neighbors struggling and

you're not doing so bad." All four of the industrial farmers that mentioned the peculiar dynamics of the 2008 financial crisis brought up this issue. Because demand for agricultural goods is inelastic, the economics of industrial agriculture often run contrary to the trends of the domestic market. As such, farmers often struggle when the economy does well and thrive when the market turns downward.

This complex dynamic was also present in the way that industrial farmers talked about the economic consequences of the COVID-19 pandemic. The interviews for this project were conducted from the spring of 2020 through the winter of 2021 – square in the middle of the pandemic. At the beginning of the pandemic in the spring of 2020, many farmers were pessimistic about the effect that the pandemic would have on the agricultural market. As Dan put it:

[The pandemic] could be really tough for us... With demand for gas being down, there goes the demand for ethanol. That's like a quarter of our market for corn. Plus who knows if we're going to be able to export our grain. We could be in a hell of a mess.

The perspective that Dan shared was part of a larger discussion we had about the implications of the pandemic. The conversation I had with Dan was in early May of 2020. At the time, very few people had a good idea of how long the pandemic restrictions would last. Although early fears of apocalyptic scenarios had ebbed somewhat, many people were still quite pessimistic about the future. Although Dan thought that farmers could be "in a hell of a mess," he said so in the context of saying that pretty much the whole world could be in the same mess.

Later on in the pandemic, the perspective of industrial farmers started to change. As news about the release of the vaccine and the potential for the end of restrictions started to come out, farmers began to grow optimistic about the potential for growth in the agricultural market. In late January of 2021, I asked Erica what she thought might happen with agriculture in the next year and she was cautiously positive:

I think – I should say I hope – it’s going to be a really good year. People are going to start traveling again, China’s going to start buying. I think we’re going to see a pretty quick turnaround and that’s going to be really good for farmers when it comes to prices.

Erica’s prediction turned out to be fairly prophetic. In the spring of 2021, prices for agricultural commodities increased dramatically, partly as a result of increased demand. During the financial crisis, demand for agricultural products stayed stable as consumers prioritized food purchases over other spending. Conversely, the pandemic forced the closure of many meat-processing plants, leading to the culling of large portions of the U.S. hog and cattle herd. In addition, the closure of restaurants led to complications in the supply chain for producers who were used to selling goods to those venues. As a result, the easing of pandemic restrictions led to increased demand for agricultural commodities in the spring of 2021. As I informally followed-up with some of the farmers for this project in the spring and summer of 2021, many were quite excited about the subsequent increase in prices for grain and other agricultural commodities.



When I talked to industrial farmers about these issues, the main sense was that they had very little impact on these developments. Although many thought that the behavior of government officials could influence the outcome of these events and explicitly connected them to their political leanings, the general sense was that the farmers themselves were utterly powerless in the face of these forces. In this context, farmers framed themselves as completely at the mercy of global market trends and historical events far beyond their control.

### *Self-Efficacy in the Global Market for Industrial Agriculture*

At the hands of such a vast and impersonal system, it would seem that industrial farmers lack agency when it comes to economic success in the field of agriculture. However, the majority of industrial farmers felt quite the opposite. In fact, they thought that in a world in which success often feels detached from effort or talent, farming remains a field in which hard work and smarts can be marshalled for financial success. On an individual level, industrial farmers thought that if they were able to marshal a high level of intelligence, they would be able to succeed as a farmer. Additionally, I argue that the familial nature of farms makes them unique economic entities. In the face of impersonal and overwhelming market and historical forces, farm families have a unique set of resources at their disposal. However, operating such enterprises within families also comes with its own struggles for the individuals involved.

When the industrial farmers described the intelligence necessary for success in the field of agriculture, the concept had several facets. At a fundamental level, farmers argued that farming itself requires an immense level of knowledge. Knowing how to run equipment, when to plant certain varieties and the appropriate chemicals, as well as the right time to begin

harvesting are all prerequisites for success as a farmer. As Alex said to me, “It takes some real know-how just to get your crop in and out of the field on time.” This level of intelligence was discussed at length in Part 1 of this project. Here, the more relevant facet of farmer intelligence is making the right financial and economic moves.

For the industrial farmers, the factor that separates a farmer that is on the edge of bankruptcy from a farmer that enjoys high levels of financial success is their ability to make the right moves in the various markets in which they find themselves. That is, even more than the ability to maximize efficiency and yield on the farm itself, for the industrial farmers the ability to be a shrewd and intelligent businessperson is the key to a farmer’s success.

Of the twenty-six industrial farmers I interviewed, eleven discussed the need for a farmer to be shrewd businessperson in order to be successful. For example, when I talked to Aaron about his family’s success in the business of agriculture, he said:

One of the differences between us and other farmers around here is that we understand that this is a business. We try to maximize yield and all that sort of stuff but at the end of the day, the math has to work out. If something you’re doing isn’t going to make you money, you have to cut it out.

For Aaron, the drive to maximize production in his family’s fields comes secondary to the drive to maximize profit from their operations. Aaron later referred to a billboard near his farm that celebrated a local farmer for winning Michigan’s corn yield contest by growing over 476 bushels per acre (the average for the state was around 150 bu/acre). Aaron said that in order to achieve that level of yield, the farmer had to “max out” every type of input and that the farmer had

likely lost money on that field. As Aaron later said, “it’s great that we can grow that much, but we’re not trying to win contests. We’re trying to make money.”

Aaron’s mentioning of the yield contest winner mirrored other farmers in the way they talked about this issue. Often, it wasn’t exactly clear what moves were the smart ones that led to financial success. Rather, the farmers often pointed to farms that had failed and argued that such failures must have been the result of poor decisions. For example, when I talked to Brad, he said that the high rates of closure among dairy farms was due as much to mismanagement as it was to larger forces:

Look—you see [our neighboring farm] closing down and everyone feels bad for them, but you have to look at how they were managing the farm. Those guys hadn’t upgraded their [milking] parlor in a long time, their feed’s shit, and they wonder why they can’t make any money... I feel bad for them, but you have to be smarter than that.

From Brad’s perspective, the failure of his neighbor’s farm was at least partly a result of poor management. Although he also recognized that the dairy business is a difficult one to succeed in, he argued that the failure of individual farms comes down to their inability to compete at the appropriate level. For Brad, although upgrading milking parlors and ensuring high-quality feed costs money, they are ultimately worthwhile investments. For the farmers who discussed the need to be intelligent businesspeople, the most frequent reference was to the failure of other farmers to do so and the logic of their subsequent failure. Of the eleven farmers who

mentioned then need for shrewd business logic in industrial agriculture, nine were references to the failure of other farms.

By comparing themselves to their less successful neighbors in this way, the industrial farmers accomplish two functions. The first is that the failure of farms in their area is given a local logic. On the one hand, as I discussed in the previous section, many of the farmers recognized the challenges that farmers face in the global agricultural market. On the other hand, by criticizing the farm management decisions of their less-successful neighbors, these farmers assign the responsibility for the failure of their neighbors' farms to a more local source—namely, their neighbors. In a global system that feels impossible to have a meaningful effect on, the ultimate failure of local farms becomes the responsibility of local farmers.

The corollary of this assertion and the second function accomplished by such criticism is that the farmers who remain successful can internalize their continued success. In the face of global pressure and historic trends that challenge farmers across the U.S., the farmers that remain successful do so using their own wits and economic savvy. In this way, they are able to exert a sense of agency over their lives.

This sense of agency coincides with a larger sense of self-efficacy and determination. As Kevin, who spent time working off of the farm put it:

You have to have a good head on your shoulders to be a farmer. Shit has consequences for us. If you mess up, make a bad decision, you can be done. But it's real. In [my other job], it didn't feel like messing up had consequences. Here, it feels like the things I do really make a difference.

Here we see another sense in which farmers define themselves in opposition to what they perceive to be the mainstream. Having had experience working in what he called a “normal desk job,” Kevin felt like the stakes of farming were simply higher. On both the agricultural and economic front, the knife-edge realities of modern agriculture make the decisions that farmers make of vital importance.

Despite the challenges of a globally-competitive market over which farmers have essentially zero influence (and perhaps because of this reality), the farmers thought that if they were savvy enough and worked hard enough, they could be successful in the farming business. In this way, contrary to the vision of a complete lack of agency that was portrayed in the previous section, the farmers thought that their financial success was in their own hands. Indeed, the farmers thought it was a responsibility to make their farms work both because they thought that previous generations had done so for them, and they wished to pass down their lifestyle to subsequent generations.

When industrial farms are discussed in academic circles, it is often in the context of massive operations and large agribusinesses such as Monsanto, ADM, etc. Those corporations certainly structure the field of industrial agriculture and have a tremendous impact on global agricultural production. What must be kept in mind, however, is that almost all of the so-called “industrial” farms I have referred to in this project are owned and operated by families. Although large industrial farms are corporations with millions of dollars of annual revenue, they typically remain family operations. The economic implications of this dynamic are myriad. On the one hand, farming within families creates a unique institutional memory. The industrial farmers had a sense of their place in history that I found to be unique. On the other hand, farm

families become businesses, which can strain individuals and relationships between family members.

As I discussed in the previous chapter, there were several young industrial farmers who brought up the farm crisis of the 1980s as an example of the trends in the field and the difficulties of succeeding as a farmer. Although none of the young farmers who brought up the farm crisis were actually farming in the 1980s, they were all intimately aware of the challenges of that period. I argued that this is a result of having multiple generations working on the same enterprise. In family farms, the experience of older farmers is handed down to subsequent generations through storytelling and informal education.

I asked Aaron about how he came to learn about the farm crisis of the 1980s. Although he said that he had learned some of it in agricultural classes in college, the bulk of his knowledge came from within his family. We ended up having the following exchange:

Aaron: We talked a little bit about it in some of my classes... but mainly I just picked it up talking to my dad and grandpa when he was around.

Ethan: Do you think that period was pretty important – that it shaped their thinking?

Aaron: Oh, for sure. It was a tough time and they kind of talk about it a lot... But that's the type of thing you can do when you work with your dad and grandpa. They talk about things that happened with them and you get to hopefully take some of that and apply it to different situations.

As Aaron points out, the benefit of working with two previous generations in the same business is that institutional memory can be handed down. The experience of Aaron's father and grandfather during the farm crisis of the 1980s clearly had an impact on the way they thought about farming. Because Aaron grew up around the farm and also communicates informally with his predecessors on a daily basis, he is able to pick up on such experiences and allow it to shape his own thinking. In this way, industrial farmers are able to leverage the familial nature of farming to protect themselves against the challenges and impersonal nature of the global agricultural market.

Of course, this dynamic also has a downside. By conducting businesses within families, relationships between family members are strained. When siblings, parents, uncles, aunts, and cousins become business partners, challenges can mount. As I discussed in the section on agricultural loans, Jerry and his brother were forced into buying out his uncles after years of feuding between family members. Jerry hoped that by restricting the farm ownership to himself, his brother, and his father, they would minimize in-fighting. Of course, I assume that Jerry's uncles likely also hoped for the same when they took over the farm in their youth.

Thomas also discussed the challenges of working with family members. The farm that Thomas now partially owns and operates was originally owned and run by his grandfather. After Thomas bought into the farm and took over significant management responsibilities, he thought that he would have an equal voice with his father and grandfather in making decisions. According to Thomas, he is still working on asserting his voice:

My dad and grandpa, they still see me as a kid, which can be really annoying. They have so much to teach me, and I get that. But I have ideas and I want to make this farm my own, you know? That can be really frustrating sometimes, and we've gotten into it a couple times... But what else are you going to do with family?

Thomas' sentiment was shared by several of the other industrial farmers. Of the twenty-six industrial farmers in the sample, seventeen were at least the second generation on their farms. Of those seventeen, eleven mentioned conflicts between themselves and previous generations over operational decisions. Like Thomas, when these farmers discussed these issues, they often referred to the fact that previous generations saw them as kids. Particularly within the context of families, such concepts can be difficult to break. In addition, as Thomas mentions, the familiarity of family can lead these disagreements to become larger conflicts.

In contrast, the second strain within families that this dynamic can cause is within individuals. As I discussed in the previous section, it is common for the success and failure of farms to be internalized. Because farm operations are often inherited from previous generations and farmers typically intend to pass down their operations to their children, the stakes are even higher. It is commonly understood within the agricultural community that if a farmer fails to keep their farm afloat, they can feel responsible to both previous and subsequent generations. As opposed to a typical business in which failure impacts the immediate financial situation of the business owner, their family, and its employees, the failure of a farm is understood by farmers to also affect those who previously ran the farm and those who might have done so in the future.



In the process of researching for this project, I came into contact with a host of material from agribusinesses, university agricultural extensions offices, and industrial groups. I found it remarkable how common it was for these materials to include links to mental health support for farmers. For example, Michigan State University Extension has multiple groups to help farmers manage stress on the farm and holds seminars throughout the year for farmers to recognize warning signs of deteriorating mental health in themselves and their peers.

Given the taboo nature of such topics, very few of the farmers discussed these issues in detail. After seeing such materials, I asked several subsequent interviewees if they thought these issues were problematic. The response I received on such occasions were typically non-committal and unenthusiastic. In the words of Benjamin, "I guess it might be a problem for some people. I don't really know."

Despite the limits to which farmers discussed these issues directly, they were often more open about feeling the pressure of multiple generations. For example, I asked Mark if he hoped his children would take over the farm and he had this to say:

If they love it, which I hope to God they do, I would love for them to take over after me. But it's not easy. You can't make a lot of money doing this and it can be stressful. I felt a lot of pressure from my dad and grandpa to take over and I don't want my kids to feel that from me. If they want to farm, I want them to farm for themselves, not for me.

From Mark's perspective, he would love for his children to take over the work he does on the farm. However, he recognizes the pressure that previous generations put on him to take over

the farm and he does not wish for his children to feel the same pressure. As he says, farming can be a stressful job. For Mark, the more he can lessen the extent to which his children feel pressure from their family members to be successful in farming, the better.

Despite the challenges of operating at the whims of global markets and historic trends, the industrial farmers found ways to exert their own agency. In fact, many thought that they had more control over their own success than many people are able to have in today's world. By marshaling the faculties of their own intelligence and the institutional resources inherent in a multi-generational organization, industrial farmers thought they were able to be successful in today's agricultural economy.

#### *Summary of the Economics of Industrial Agriculture*

The discourse of industrial farmers about agricultural economics demonstrates a variety of dynamics. Although farmers occasionally thought that they were powerless to resist the forces of global markets and historical events, they also evinced a sense of self-efficacy and assurance in their own ability to succeed.

In the previous chapters on the knowledge systems and politics of the logics of industrial and ecological agriculture ended with a description of how each pole portrayed its opposite. In the areas of knowledge and politics, farmers had much to criticize about the behavior of their counterparts. When it came to economics and business practices, however, farmers had very little in the way of criticisms for the opposite pole. In fact, many were supportive of all farmers in their various enterprises. This dynamic will be discussed in greater detail in the conclusion chapter.

## 4.2 Economics Within the Logic of Ecological Agricultural

When farmers and other commentators talk about agricultural economics, what they mostly mean is the economics of industrial agriculture. Global prices for agricultural commodities constitute the substantive talking points for national politicians and bureaucrats of agencies like the United States Department of Agriculture (USDA) and the Michigan Department of Agriculture and Rural Development (MDARD). However, in addition to mobilizing an alternative perspective on agricultural science and politics, ecological farmers also present different ideas about how to make money as a farmer.

As in the case of industrial farmers, ecological farmers seek to expand their positions within the supply chain of agricultural products in order to command more of the ultimate food dollar. However, ecological farmers argue that the customers who buy their products are willing to pay a premium for their products due to the manner in which they were produced. Ecological farmers have a variety of methods to demonstrate the quality of their products in order for them to fetch a higher price. They also use a variety of techniques, particularly social media, to create a unique brand and personality associated with their products. In this way, farmers demonstrate their awareness that their customers are not only concerned about the health and environmental impact of their food products, but also the ways in which purchasing food produced by ecological farmers contributes to a larger lifestyle.

The economic discourse of ecological farmers is also revealing in terms of the ways that ecological farmers think about their position in local and international agricultural markets. Ecological farmers spoke openly about the challenges of making a living as an ecological farmer. Although these farmers recognized that they would never be rich, they valued the way that

their businesses contributed to their lifestyles. As such, ecological farmers emphasized the way in which their business model fit within a larger worldview. By emphasizing local markets, ecological farmers manifest a more locally-oriented and ecologically-minded economic system. One challenge for ecological farmers was the battle between increasing their efficiency and staying true to their ecological principles. In this way, ecological farmers demonstrated a somewhat strained relationship between the logic of ecological agriculture and the economic necessities of living in a capitalist system.

The following section will proceed in two parts. The first discusses the economic practices of ecological farmers. These are the techniques and practices used by ecological farmers to maintain profitability within the logic of ecological agriculture. The second section analyzes the economic discourse of ecological farmers. As with industrial farmers, the way that these farmers talk about economics reveals a great deal about the way they think about these issues.

#### 4.2.1 Economic Practices of Ecological Farmers

Ecological farmers use a variety of techniques in order to maintain profitability. As several ecological farmers told me, “Farm sustainability also means financial sustainability.” That is, although ecological farmers were clear about the nobility and moral righteousness of their practices, they also recognized that maintaining profitability remains essential in order to continue practicing in their desired manner.

As in the case of industrial farmers using grain bin storage and futures contracts to expand into multiple parts of the supply chain, ecological farmers also sought to gain more of

the percentage of a customer's food dollar. However, rather than seeking to occupy more positions within the supply chain, ecological farmers sought to shorten the distance between themselves and customers. By selling directly to customers in farmers' markets and CSAs, ecological farmers were able to put more of the sale price of their goods into their own pockets.

In addition to garnering more of a customer's food dollar, ecological farmers sought to imbue their products with various measures of quality in order to increase its price. Various labeling practices including certified organic were used to communicate that the product was of a high quality. In addition, ecological farmers used virtual and in-person farm tours in order to communicate the value of their product to potential customers. These farmers recognized that their customers wanted food products that fit within an ecologically-conscious lifestyle. Through various methods, farmers sought to both encourage those lifestyles and match their products to it.

Finally, ecological farmers sought to maintain profitability through a mentality of entrepreneurship. By "stacking" multiple enterprises within a single system, ecological farmers created on-farm ecosystems with multiple parts geared toward profitability. In this way, ecological farmers manifested an attitude of ecological efficiency that matched the economic mindset of capitalism to the environmental focus of ecological agriculture.

These techniques were all used to maintain the profitability of the farm. In many ways, the justification for the practices of ecological farmers were those discussed in the epistemic

and political chapters. Here, I discuss the ways in which ecological farmers connect their justifications for farming within the logic of ecological agriculture to their need to make money.

### *Selling Directly to Customers*

Perhaps the most important economic technique used by ecological farmers is selling directly to customers. For industrial farmers, the ultimate human consumption of their product is almost beyond consideration. The bulk grain buyer who purchases corn from a farmer might sell it to a processor who turns it into ethanol, high-fructose corn syrup, or cattle feed that is then sold to a cattle-finishing operation for it to be consumed by beef steer that ultimately needs to be sold to another processor before perhaps ending up as a human customer's hamburger. For the ecological farmer, the tomato plucked from the tomato plant is put into the hand of a customer who will likely either eat it or prepare it for the person who will eat it. By doing so, ecological farmers are able to shorten the distance between themselves and the customer in order to maximize the percentage of a customer's food dollar they are able to put in their pocket.

For ecological farmers, there were three main ways of selling directly to customers. The first was through selling to farmers' markets. Although these markets provided farmers with the potential to sell to many customers, the farmers frequently noted that the biggest value of farmers markets was typically for getting customers into the second way of selling directly to customers: community-supported agriculture (CSA) programs or on-farm markets. The third method that ecological farmers had of selling directly to customers was to partner directly with local restaurants or grocery stores. Although restaurants and grocery stores do represent an

additional link in the chain between farmers and consumers, they are also typically willing to pay premium prices for locally-sourced, high quality food products.

Farmers' markets are perhaps the most famous version of direct-to-consumer sales for ecological farmers. The scene for farmers markets has exploded in recent years as more customers seek local sources of quality food. Although these markets are very useful for ecological farmers to interact directly with customers, they can be expensive and time-consuming ventures. When I spoke with Paul about the way he reaches customers, he was clear about the pros and cons of farmers markets:

I go to the markets in Ann Arbor and Dexter. Sometimes I get to some closer to Detroit. And sometimes you can make good money. If the right crowd is there and you hit it at the right time, you can do well. But it can also be a bust... Once you add up the fee to get down there and sitting there all day, you're just not making that much money.

Paul went on to emphasize that working on the farm itself was a more efficient use of his time. Many of the other ecological farmers felt the same way. Of the twenty-five ecological farmers, twelve said they sold some of their goods at farmers markets. Of those twelve, nine said that although farmers markets useful, the markets did not constitute their main source of income.

For several of the farmers who sold at farmers markets but did not find them particularly profitable, the markets served other purposes. In particular, the farmers argued that although the markets were not primary sources of revenue, they did serve as recruitment

tools for their on-farm sales. For Cara, the key was to put on a good performance at the market in order to get customers to come to her farm.

When it's nice, I drive my mules to the market in [town]. It's kind of fun for me and it's fun for everyone to see them. [The mules] don't do a whole lot around here but they're a nice eye catcher for folks. Maybe then they come by the farm stand, sign up for the CSA—I've gotten a lot of my CSA customers that way.

In this way, Cara uses the farmers market to put on the show necessary to recruit customers to the more lucrative parts of her business. By driving mules to the farmers market, Cara enacts a particular lifestyle that CSA customers desire. The mules remind customers of an imagined time in which the world was simpler, and food was grown locally. By engaging this imagined former world, Cara engages customers to participate in the lifestyle of ecological agriculture. To a perhaps less dramatic extent, the other ecological farmers used the farmers markets to do the same thing – put on the show necessary to convince customers to participate in the lucrative part of the ecological farming business.

Indeed, the intention of the CSA program and on-farm markets or farm stands is to have the customers come to the ecological farmers. In CSA programs, individuals and families typically pay up-front for a growing season's worth of groceries. Customers then either meet at a particular location at an agreed-upon time or visit the farm itself in order to pick up their weekly or semi-weekly share of groceries. Conversely, on-farm markets or farm stands rely on



customers coming to the farm itself in order to purchase goods. Twelve ecological farmers in the sample had on-farm markets and sixteen ran CSA programs (many did both).

One benefit of running a CSA program is that it locks in a group of customers to an entire growing season's worth of groceries. These customers typically discover the farmers either through farmers markets or social media and have (literally and figuratively) bought in to what the farmers are trying to do. When I asked Jeff about the market for his farm, he was clear that the CSA was the main money-maker:

We do farmers markets, some sales to a couple of local restaurants, but our main thing is the CSA. We have folks coming every day of the week picking up groceries at the farm stand. Those folks are the heartbeat of what we do here. Without them, none of this would be here.

The farm that Jeff works on is certified organic and runs one of the larger CSA programs in southwestern Michigan. After building slowly over the course of multiple decades, the farm now has over a dozen employees and is the largest single ecological operation of any I visited. The entire business remains predicated on local sales to committed customers. Some are able to come from as far away as Chicago, but many are within an hour's drive. After speaking with Jeff and visiting the farm, I was impressed by the scale of operation built upon direct-to-consumer sales through a CSA.

In addition, as Jeff alluded to, the farm he works at also runs a farm stand. When customers come to pick up their CSA share, they occasionally purchase additional items offered in the market. Of course, the farm stand also provides the opportunity for non-CSA customers

to purchase groceries on the farm. Whereas Jeff's farm relies mainly on the CSA and the farm stand provides mostly a side benefit, Cheryl's farm relied mainly on the farm stand itself. Built in a small barn on the side of a road, Cheryl's farm stand is able to attract a significant number of tourists visiting the area. When I visited Cheryl in late July, the farm stand was packed.

Interviewer: Is the farm stand usually this busy?

Cheryl: In the summer, oh yeah. Lots of folks coming up from Chicago and that area for a getaway. Weekends are obviously busier, but we'll have a hundred people come through on a Wednesday, no problem. They like to take pictures with the barn and stuff. People like it.

Whereas Jeff's operation catered to dedicated customers looking for consistent access to particular food products, Cheryl's farm stand sought to capture tourists passing by on their way to their beach vacations. As Cheryl mentioned, the southwestern Michigan area is ideal for many Chicago-based residents to get out of the city and enjoy more rural environs coupled with the sandy beaches of Lake Michigan. Evidently, part of enjoying such a vacation includes a visit to a roadside farm stand. Again, the farm provides a platform for people to enact a more agrarian lifestyle, if only momentarily during a trip away from the city.

The final way in which ecological farmers sought to decrease the distance between themselves and their customers was through selling to local restaurants and grocery stores. A variety of restaurants throughout Michigan advertise that their products are locally sourced. In addition, several ecological farmers were able to get their products onto shelves in grocery stores such as Meijer and even locally-run convenience stores. For these outlets, the locally-

grown nature of such products imbue them with high quality status and thus a higher price. By selling to these outlets, the farmers are able to expand their markets while staying relatively close to the ultimate consumer.

Selling to restaurants in particular creates a unique demand for high quality. Sarah runs a certified organic farm that sells lamb to local restaurants. According to her, the quality of her products speaks for itself, and she does not worry about getting return customers:

You have to understand – no one else around here raises lamb like this. When I work with chefs, I tell them, “You’re never going to want to go to anyone else for your lamb.” And I’ve never been wrong about that. We just do it right here, and when the customers in those restaurants get it on their plate, they can taste the difference.

For Sarah, farming the right way creates a clear taste difference in the final product. By growing high-quality products for a long period of time, Sarah thinks she has developed a reputation among fine-dining chefs in her region. What is clear is that her operation is sustained by restaurants that are eager to pay the price premium for her product.

Whereas Sarah argues that the farming practices she uses creates a uniquely high-quality product, other farmers simply benefit from being local. For most milk products, the quality is standardized and attainable by most dairy farmers. However, Zack and his family use their milk to create ice cream products that they then sell in local convenience stores. From his perspective, having locally-sourced ice cream made people more likely to buy it:

When the customer knows that the ice cream they're eating probably came from one of the cows they drove by on the way to the store, they feel good about that. I feel good about that. I love to see people eating our ice cream... Plus we are able to get more of the price of that ice cream cone because we don't have to pay a bunch of middle-men. It goes straight to the customer.

Zack's perspective emphasizes the local nature of the logic of ecological agriculture. Zack's farm is not certified organic, but he practices many organic techniques. In addition, his operation conducts farm tours for hundreds of visitors a year. In this way, Zack seeks to demonstrate the value of local farmers to those who might not know as much about agriculture. By emphasizing the local nature of the ice cream in local convenience stores, Zack thinks that both he and the customers benefit.

The use of direct-to-consumer sales is beneficial to ecological farmers in a number of ways. Primarily, it cuts down on the number of people between the producer of the product (i.e., the farmer) and the consumer. In doing so, the farmer is able to take a greater share of the price that the consumer pays for the product. In addition, by selling directly to customers, farmers are able to exemplify the type of economics that customers of ecological products want to have. That is, customers of ecological farming products want to live a lifestyle that includes purchasing food directly from the farmer. In this way, these techniques both benefit the farmer financially and promote the logic of ecological agriculture.

*Increase Price through Quality*

As mentioned in the previous section, an important aspect of the products of ecological agriculture is the perception that they are of a higher quality. The task for ecological farmers, then, is to convince customers that the practices of their farms match what customers have come to expect of high-quality food products. In order to achieve the price premium attendant to ecologically-raised goods, farmers must demonstrate to their customers that they farm in an ecological manner. There are several techniques for achieving this goal. The first is labeling. Whether certified organic, cage-free, pasture raised, or any of the other food labels, ecological farmers use a variety of methods to communicate their practices to the customer. However, these labels have increasingly come under scrutiny for failing to hold farmers to the standards expected by customers. As such, farmers have begun to mobilize alternative methods to communicate their commitment to the logic of ecological agriculture. Ecological farmers tried to personalize their food products through social media campaigns, on-farm tours, and emotional marketing.

Of the twenty-five ecological farmers I interviewed, ten had organic certifications. For these ten farmers, organic certification through the USDA was the proper method for communicating their methods to customers. When I talked to Michael, who runs a certified organic operation of mostly blueberries on the west side of Michigan, he was convinced of the benefits of organic certification:

It's the only way people really know what you have going on at your farm. It's not easy to get certified and it's not cheap, but if you want to make sure you're doing the right thing, it's the way to go.

Having completed the organic certification, Michael is invested in its legitimacy. He later told me that he tries to educate his customers on the benefits of organic certification when they ask about it. The other ecological farmers with organic certification felt much the same.

The remaining fifteen ecological farmers were more skeptical of the benefits of organic certification. Some considered themselves “basically organic,” but without the certification. In fact, three ecological farmers told me that they were organic and then corrected themselves to say that they followed organic practices but did not have organic certification. For these farmers, the benefits of the certified organic label did not seem to be a high priority.

Other ecological farmers were more directly critical of labeling systems. Many ecological farmers came to their practices through the desire to eat healthy, chemical-free food within their own families. In the process of learning about various labeling systems, they came to distrust the legitimacy of the labels and look for alternative methods to communicate their practices to their customers. For example, Phil said that his family had begun to look into pasture-raised meat and found the labels to be lacking:

You know a lot of those labels are bullshit, right? I mean it can say “pasture-raised” and you think it’s on a pasture but that just means they have to let it onto grass some of the time. I told people if they wanted to see what was going on at my farm, they were always welcome to come by. Any day of the year, those animals are going to be on a pasture and you can see them there.

For Phil and others operating within the logic of ecological agriculture, labels can lose their legitimacy when the customers they are intended for come to feel that they fail

to live up to the standards they are intended to measure. Although labels are convenient ways to communicate that a food product was produced in a particular manner, many have come to lose their legitimacy among their core customers. Phil's method of inviting customers to come to his farm any time during the year was a common method of countering this dynamic. Nine of the fifteen farmers who rejected labels mentioned that they welcomed potential customers to visit their farms to see for themselves.

In addition to inviting customers to visit the farm in person, several farmers sought to bring their farms to the customers through the use of social media. Doing so both gives customers a background insight into the story and characters that produce their food and allows the farmers to share their lifestyle. According to ecological farmers, customers both want to know that their food is being produced in ways that are in-line with the logic of ecological agriculture and to participate in a broader lifestyle that emphasizes the natural world and a simple, rural aesthetic. Although only three of the ecological farmers relied on social media in this way, they thought that it was important part of their own operation and would continue to affect ecological farming into the future.

One method for this technique was used by Robin. The organization that Robin works for uses cutting-edge hydroponic technology to grow salad greens in a sustainable manner. For Robin, who runs the organization's social media account, sharing high-quality pictures of their growing system is an essential part of communicating their process to customers:

We're a high-tech place in a lot of ways and I try to communicate that. The rows of lettuce look pretty space age, and I like to take pictures of that. But I also try to share pictures of the people who work here, so it's like, "Yeah, we're space age, but we're also people and we like eating salad."

By sharing the high-tech nature of her workplace, Robin seeks to tap into a collectively-imagined future of indoor farms in sterile environments. Although this imagination captures an important association with futurism and environmental consciousness, she also found it important to include the human side of the operation. Through the combination of high-tech systems and the in-the-moment lived experience of the employees, Robin thought she might communicate important information to customers.

An alternative approach for ecological farmers was a to attempt to capture a natural and simple agrarian lifestyle. For Jessica, who works as part of a collective of farmers in southeast Michigan, sharing her lifestyle with customers was an important part of getting their message out:

I love what we do here. It's a different kind of life. I try to communicate that to people. The more people we can get doing this sort of thing or supporting those of us who can do this sort of thing, the better chance we have... I also think there are just a lot of opportunities to take really pretty photos and share them on Instagram.

Like many ecological farmers, the choice to farm within the logic of ecological agriculture is part of a larger lifestyle choice of living simply in community with like-minded people and the



natural environment. Part of my own interest in the topic for this project was inspired through observing ecological farmers on social media. In sharing their lifestyle on social media, ecological farmers contribute to the movement of people pushing for the advancement of the logic of ecological agriculture. Of course, as Jessica says, it helps that there ecological farming produces an abundance of opportunities to take great photos.

By using various methods to communicate the quality of their products, ecological farmers are able to expand their customer base. Through these methods, they both inform potential customers about the value of their production methods and communicate their allegiance to those methods. Although there is some division among ecological farmers about the legitimacy of methods including labeling, different ecological farmers find different ways to communicate their story to customers.

### *Entrepreneurship Mentality*

In addition to the practical techniques of trying to both increase the percentage that the farmer takes of the customer's food dollar and increase the price of farm products, ecological farmers also lean heavily into an entrepreneurial mentality in order to achieve success. Two related aspects of this mentality are diversification and efficiency. Ecological farmers seek to diversify their operation in order to maximize the profitability of their farms. Ecological farmers frequently referred to "stacking" enterprises – that is, connecting multiple systems on the farm that each produce profit while benefitting from one another. In addition, a major point that many ecological farmers made to me was to be efficient with money. Ecological farming is often part of a larger mentality shift toward a simplistic lifestyle in which the importance of material

possessions is minimized. Several ecological farmers were clear that sacrificing creature comforts like new technology was essential to the financial success on the farm. Together, these techniques comprise an ethic of entrepreneurialism that was important to the logic of ecological agriculture.

For ecological farmers, diversification served multiple purposes. As discussed in the section on epistemology, ecological farmers seek to replicate the biodiversity of nature in order to create a sustainable ecology within an agricultural system. The byproducts and activities of some species are used as inputs for the growth of others within the logic of ecological agriculture. For many ecological farmers, this logic also has economic benefits. For Amy, having a diverse array of crops with different growing seasons allows her to lengthen her CSA while matching natural cycles.

The strawberries over there, those will peak like June through early July. But we try to get some greens going early with the greenhouse so we can fill baskets with spinach in May and sometimes April... But once we get late into the season we end up with a lot of squash and potatoes... We try to follow nature. You get the food that is right to eat at that time of the year, but you have to have a wide range of crops to do that.

The diversity that Amy emphasizes as part of the logic of ecological agriculture both mimics nature and allows for the CSA to stretch from April through late October and into November. In this way, the biomimicry that is essential to the logic of ecological agriculture also supports the economics of ecological farmers.

When ecological farmers talked about the economics of diversity, many of them used the term “stacking” enterprises. The concept here is that multiple profit-generating systems can be built on top of one another in order to maximize profit. For example, ecological farmers who raise livestock on pasture-based systems will often use larger animals such as sheep or cows to graze down pastures that have grown tall. After the larger livestock pass through, farmers will put chickens or other fowl on the pasture. According to several of ecological farmers, the chickens prefer the shorter grasses and are also able to spread out the manure left by the larger livestock. Furthermore, this system allows ecological farmers to generate profit from their pasture more quickly, as the maturation time for chickens is much shorter than that of beef steers or lambs.

Of the twenty-five ecological farmers, seven of them used the term “stacking” to refer to diversifying profit-making systems on their farms. Phil used a system very much like the one described above, with a flock of laying hens following his herd of beef cattle through his pasture. In addition, Jeff’s operation sought to stack enterprises by maximizing the interests of the individuals working on the farm:

We like to let people find their niche here. I’m kind of the machinery guy.

When things break, I can usually figure out how to fix them, and that saves us money. [My coworker] is a really good graphic designer so she does a lot of our logos... [My other coworker] wanted to bring in ducks, so we’ve been trying to figure out how to work that into our system.

This method of allowing individuals to work on the types of things they're interested in was a common theme for ecological farmers. Later, Jeff linked their system of allowing individuals to find a niche that works for them to natural systems in which organisms find a niche to flourish in. In this process, ecological farmers thought that allowing each individual to build on the existing operation in a way that maximized their interests and talents would allow for the entire operation to thrive.

In addition to building multiple profit-generating systems within a single farm, ecological farmers also evince an entrepreneurial mindset by emphasizing a slow-growth, no-debt model of building a farm. This is perhaps the only area where ecological farmers were particularly critical of the economics of industrial agriculture. Whereas one of the major techniques for expanding (and even maintaining) industrial farm enterprises is through the use of agricultural loans, ecological farmers argued that such practices locked farmers into unhealthy practices. For example, Justin was highly critical of the farm credit system, likening it to a form of addiction:

These big farmers down the street, they're up to their neck in addictions. Of course, they're addicted to the chemicals that they need for any sort of soil fertility. They're also addicted to credit from the bank to fuel their practices. But of course, once you're hooked on the credit, the only thing you can do is use more chemicals and the cycle builds.

According to Justin, the major issue with farm loans is that they lock the farmer into certain types of practices. After receiving loans from a bank, a farmer has no other option than to

expand their production through industrial methods. Of the twenty-five ecological farmers I interviewed, six referred to industrial farming in the terms of addiction.

The response to these criticisms for ecological farmers is to build farm enterprises slowly, pumping any profits back into the farm in order to expand. This method values getting out of debt before attempting to build an ecological farming enterprise. After achieving debt-free status, ecological farmers are encouraged to live simply and frugally while building a solid business. Jessica highlighted these issues when I talked to her:

We give talks to lots of young folks looking to start something like this. The thing I always tell them is not to quit their day job until they've gotten out of debt. Student loans, car notes, those sorts of things will drag you down when you're starting out. I say, "get those paid off, start a little something on the side, then you can work up."

It is important to note that Jessica and others encouraged early-career ecological farmers to start building their enterprises while working to pay off debts. For many ecological farming represents a rejection of the status quo and having a "normal job." However, Jessica and others cautioned hopeful ecological farmers to unburden themselves from debt before making such a jump completely. Instead, prospective farmers were encouraged to start building their enterprise on the side in order to build skills and a customer base before fully committing to the ecological farming lifestyle.

Once ecological farmers make the jump, they continue to emphasize living a frugal lifestyle. No fewer than eight ecological farmers mentioned that they do not have a Netflix

subscription as a way to indicate their dedication to a lifestyle free of creature comforts that are seen as unnecessary and a waste of money. Darren put this perspective most directly:

When we started this, we got rid of our cable subscription. We don't have Netflix or Amazon Prime or anything like that. We try to spend time with each other and doing the things that we love. [My wife] and I decided that all that other stuff is just material things that don't end up giving you much and are a ton of money.

In this way, the frugality necessary to continue working a nine-to-five job that was emphasized by Jessica is but practice for the goal of becoming an ecological farmer. Ecological farmers specifically choose to reject many of the creature comforts of modern life. The cost of such creature comforts as on-demand streaming video is saved and time that would be spent on such activities is channeled into productive work on the farm.

Together, these techniques make up a larger entrepreneurial mindset that is embraced by ecological farmers. Here, the logic of ecological agriculture becomes articulated with the financial necessities of such a business through what is understood to be a rejection of the mainstream economic mindset. Rather than building a single system in order to produce as much as possible of a single good, ecological farmers stack multiple enterprises in order to diversify their profit-making opportunities. In order to save money, ecological farmers stay away from debt as much as possible while rejecting expensive creature comforts. Combined with the techniques discussed in the previous section, this mentality allows ecological farmers to make a living in the competitive world of agriculture.

### *Summary of Economic Practices of Ecological Farmers*

Making a living as an ecological farmer is not an easy task. Ecological farmers must find ways to command more of a customer's food dollar while also increasing the price of food products and minimizing their own expenses. The entrepreneurial mentality embraced by many ecological farmers is a major connection across the agricultural spectrum. For all farmers, the knowledge and politics of their farming system must ultimately fit into a profitable business model.

#### 4.2.2 Economic Discourse Among Ecological Farmers

If the techniques discussed in the previous section demonstrate the ways in which ecological farmers go about staying profitable, their discourse on economic issues reveals the ways they pair the logic of ecological agriculture with the necessity to make/goal of making a living. In some ways, this goal can prove challenging, as many farmers adopt the logic of ecological agriculture with the intention of rejecting the dominant capitalist-consumerist lifestyle. One way that ecological farmers make this connection is by highlighting the importance of local markets. Rather than attempting to compete in a globally competitive agricultural marketplace, ecological farmers focus on feeding their local community. In this way, the logic of ecological agriculture is a localized response to a global problem. In addition, although some ecological farmers justify the high prices of their food products by arguing that there is no reason for farmers to be poor, many simply recognize that their enterprises will never lead them to great riches. Rather, ecological farmers seek to continue their lifestyles while putting healthy food on their family's table.

The first section of this chapter will focus on the ways in which ecological farmers talk about the difficulties of matching the logic of ecological agriculture with the necessities of living within a consumerist society. This section will be followed by an analysis of the localized nature of ecological agriculture's economic model. The final section of this chapter will examine the ways that ecological farmers think about money in a general sense.

*Decrease Costs/Efficiency vs. Staying True/Matching Lifestyle with Economics?*

As mentioned previously, many ecological farmers came to their practice through a significant rupture with a previous life. Many ecological farmers had a ready story to tell about how they were living an unexamined and unhealthy life that fit in with what they understood to be the mold of a "normal life." Through various political and epistemic pathways, ecological farmers adopted the logic of ecological agriculture. Importantly, none of the ecological farmers I interviewed said that they got into agriculture to become rich. Rather, they were convinced to adopt the logic of ecological agriculture through either knowledge about the necessity of ecological farming or the political calls for food justice and other movements (often both). However, after they adopted this lifestyle, they often found that it could be difficult to maintain in a world dominated by consumerism.

Ecological farmers talked about this challenge manifesting itself in multiple ways. The first challenge that ecological farmers mentioned was resisting consumerism within the family. Farmers mentioned that both they and their families occasionally struggled to maintain what they perceived to be the simple, natural, and superior lifestyle of ecological farming. Harriet was clear about the challenges of raising her daughters on their organic farm:



This life isn't easy all the time. You send your kids to school, and they see the newest gadgets their friends have. They ask you why they can't have those things. Even me. You see an ad for a new car or whatever the newest thing is, and you think to yourself, "that might be kind of nice."

An important part of the logic of ecological agriculture is a rejection of these sorts of consumerist desires. Of course, although many ecological farmers try to embrace a simpler lifestyle on their farms and in their homes, they and their families must (at least occasionally) venture off the farm. Five ecological farmers mentioned that it can be difficult to maintain the relatively spartan lifestyle that attends the logic of ecological agriculture when faced with the allure of consumerism.

Ultimately, though, ecological farmers say they prefer their lifestyles over what they consider to be the mainstream. To them, living simply and in accordance with nature allows for a life that is not only more sustainable but also more fulfilling. For example, Justin recognized the difficulty of his own lifestyle compared to that of what he considered to be the mainstream-consumerist lifestyle, and he justified his decisions in this way:

But all that stuff [*i.e.*, *consumer goods*] is like sugar. It's really attractive and it makes you feel really good for about two seconds. Then what happens? You crash. And you want more. This here – this is harder. But it fills you up in a more substantial way.

Justin's analogy reveals the intricate connections of food and lifestyle within the logic of ecological agriculture. Within this logic, the mainstream food landscape is dominated by sugary

treats that are tempting in the moment but can lead to disease in the long term. Likewise, ecological farmers see the mainstream consumerist lifestyle to be one filled with tempting items that are ultimately unfulfilling and potentially disease-inducing. The simplistic lifestyle and wholesome foodscape of ecological agriculture is seen as being better suited for both physical and mental health.

There was considerable variation among ecological farmers in terms of their stance on this issue. Whereas some farmers embraced the spartan lifestyle encouraged by the logic of ecological agriculture, others argued that the relative poverty of an ecological farmer's lifestyle was illogical. For example, when I asked about the high prices of goods produced within the logic of ecological agriculture, Michael had this to say:

See – everyone wants healthy food, but no one wants to pay for it. Everyone seems to be ok with their banker driving a Mercedes, but no one wants their farmer to be driving one. Why is that? Why do we have this expectation that farmers aren't supposed to make any money? To me, that's just a little backwards.

Michael went on to say that he preferred to reject the consumerist lifestyle like many of the other ecological farmers. However, this quote demonstrates that this position is not a simple one to take. Although Michael rejects the value for consumer goods that appears to be dominant in society, he also argues that farmers are undervalued. Although he has embraced the simple lifestyle of an ecological farmer, he also

somewhat resented the fact that such a lifestyle was in some ways imposed upon him by consumers who expect low food prices.

The second way that the consumerist economy challenges the logic of ecological agriculture is when ecological farmers leverage consumerism for their own benefit. To some extent, ecological farming has become a kind of lifestyle brand that consumers use as a form of conspicuous consumption. By purchasing food that is marked as being in compliance with the latest eco-conscious or animal-welfare standards (e.g., organic, pasture-raised, cruelty-free, hormone-free, local, etc.), customers communicate to themselves and to their proximate social group both their moral judiciousness and that they are “in the know.” For ecological farmers, there is a tension between maximizing their own profit from this form of eco-consumerism and feeling that perhaps this phenomenon is a bastardization of the logic of ecological agriculture.

Only two ecological farmers mentioned this issue. However, I found this quote from Amy to summarize this tension well:

I got into doing this because I wanted to change the world. I was young.

Maybe a little naïve but I really thought doing this sort of thing could change the world. Sometimes I worry that all I’m doing is selling people overpriced kale so they can take pictures and put them on Instagram... That’s great for business, but are we making the world a better place? I don’t know.

In this quote, Amy reveals a central tension in the logic of ecological agriculture, particularly as it relates to economics. In many ways, the logic of ecological agriculture is predicated on a rejection of mainstream consumerist economics. In building an alternative to the logic of

industrial agriculture, ecological farmers must convince consumers that purchasing their goods is worth the increased hassle of going to a farmers' market or a CSA pickup, the challenges of cooking and eating food that is in season, and the increased price of ecologically produced food. One effective method of convincing consumers is to associate their consumption of ecological agriculture products with an attractive lifestyle. In doing so, however, at least some ecological farmers thought that they were failing to fully reject the allure of consumerism.

Many ecological farmers see what they do as a radical rejection of the status quo. They understand the logic of industrial agriculture to be congruent with the dominant logic of consumer capitalism. By building an alternative to the mainstream agricultural logic, ecological farmers choose to reject consumerism. However, that rejection is not a one-time project. Ecological farmers must be continually committed to the lifestyle of ecological farming in order to avoid falling to the temptations of the mainstream. Furthermore, the rejection of consumerism can cause tension within ecological farmers when they subsequently seek to leverage lifestyle consumption in order to increase their own profits.

### *Local Markets*

One way that ecological farmers manage the tension of economics and ecological agriculture is to emphasize the local nature of their market. Whereas industrial farmers often highlighted their contribution to "feeding the world," ecological farmers were more concerned about feeding their neighbors. For ecological farmers, providing for one's community is an essential part of the logic of ecological agriculture. Although the logic of ecological agriculture

emphasizes the embeddedness of farms within an ecosystem, it also emphasizes the embeddedness of farmers within a community.

A common phrase that ecological farmers used to describe the importance of local markets is “feeding actual people.” Although almost all of the ecological farmers emphasized the importance of selling locally, seven used some version of this phrase. The sense of this phrase is that rather than contributing to a global and impersonal food system, ecological farmers contributed to the feeding of their neighbors and community members. Andy put it this way:

I love being a part of feeding people. That’s what’s really at the bottom of what we do here. I’m not just growing tomatoes and greens and that stuff. I’m growing food that goes into the kitchens of my neighbors... When it gets tough, that’s the sort of thing that keeps me going.

Ecological farming requires the knowledge and ability to grow a variety of different plants. As Andy implies the complexity of such a task can become overwhelming. However, ecological farmers are ultimately motivated by factors outside their farms. Andy’s sense of “growing food that goes into the kitchens of [his] neighbors” is a major motivator for many ecological farmers.

Furthermore, several ecological farmers see feeding one’s neighbors as a healthy economic relationship between themselves and the community. In another twist on import substitution, ecological farmers argue that by selling food in their communities, they are saving money from being siphoned off by a large corporation. For example, Christopher thought that he was fighting the good fight against global corporations:

The good thing, too, is that when I sell the guy down the street a bag of spinach, that money doesn't get put into the pockets of the Meijers or the Waltons or any other rich asshole. I put it in my pocket, then I spend it at the coffeeshop in town or whatever... It stays here.

This emphasis on keeping money and resources within a community emphasizes how the logic of ecological agriculture seeks to respond to global problems in a local manner. Christopher argues that large corporate grocery stores like Meijer and Wal Mart extract resources from a community. In contrast, by selling goods within the community, he contributes to the local economy and the overall health of his community.

Although ecological farmers argue that they contribute positively to the local economy, they also recognize that their relationship with their community was symbiotic in both directions. Without their neighbors spending money on their goods, ecological farmers would not be able to sustain themselves financially. Jake put this perspective most directly:

None of us can do this alone, you know? I couldn't do what I do without the community that has grown up around us... But I feel like that's how life works. You do your best to contribute, but at the end of the day, it's the people around you that contribute to your life.

The broader point that Jake was alluding to in this quote was that although he considered his work in the community to be beneficial, he was extremely grateful to the members of the

community that supported him. It was common among ecological farmers to recognize the importance of this relationship. As Nicole put it, “The term ‘community-supported agriculture’ says it all. We’re supported by the community.”

By recognizing the importance of a symbiotic relationship between themselves and their community, these farmers did important work to connect the logic of ecological agriculture to the necessities of contemporary economics. In fact, several used ecological analogies to emphasize the importance of their relationship with the local community. For example, Jessica argued that the economic relationship between her enterprise and the local community mirrored beneficial relationships in nature:

Ecologies are all about balance – give and take. If an organism just takes and takes and takes, eventually it can’t sustain that because there won’t be anything left. Plants and animals – what they do sustains themselves but also sustains the whole system. The food we grow here sustains the community and the money and care that the community gives us, sustains us.

Here Jessica was very explicit about drawing parallels between her understanding of ecological relationships and the economic relationships that sustain her business. In this way, she allows the logic of ecological agriculture to interweave with economics.

This pairing of economics and the logic of ecological agriculture is a major challenge for ecological farmers. As we saw in the previous section, the logic of ecological agriculture can sometimes sit uneasily next to the economics of consumerism and lifestyle branding. However, by thinking of the flow of money as similar to the flow of natural resources within ecological

systems, these farmers allow for the creation of an economics of ecological agriculture. The emphasis, of course, is on the local community. By feeding one's neighbors, ecological farmers contribute to the health and vitality of the local environment. Furthermore, ecological farmers argue that when food dollars are kept out of corporate grocery stores, they continue to circulate and sustain local economies. In this way, ecological farmers make valuable contributions to their local social world while also benefitting financially.

### *Summary of the Economics of Ecological Agriculture*

The way that ecological farmers talk about the economics of agriculture reveals much about the way they view the world. In many ways, ecological farming represents a rejection of the dominant economic models of the world in which it operates. In some ways the logic of ecological agriculture is a denial of the proposal that consumer goods can provide meaning in one's life. Ecological farmers embrace a simple lifestyle in order to engage with the things they feel truly matter: living in harmony with nature while providing food for your family and community.

At the same time, there is some contradiction within the economics of ecological agriculture's logic. While attempting to reject the consumerism that dominates mainstream society, ecological farmers remain susceptible to its siren call. Resisting the sugary sweetness of consumer goods is less a one-time decision and more a full-time commitment to this alternative lifestyle in the face of constant pressure to conform. Furthermore, as the products of ecological agriculture have grown in popularity, they have become part of a lifestyle consumerism that in some ways contradicts the logic of ecological agriculture. Ecological farmers must ride a fine



line between leveraging eco-consumerism in order to maximize profit and staying true to the logic of ecological agriculture.

Ecological farmers justify the contradictions of economics and ecological logic by focusing on the local nature of their markets. The economics of ecological agriculture are analogized as ecological relationships. Farmers provide healthy and high-quality food to their community and receive financial sustenance in return. In this way, ecological farmers solve the strain between the logic of ecological agriculture and economic necessities through the encompassing of the economic within the ecological.

#### 4.3 Conclusion: Polarization or Fragmentation in Agricultural Economics?

Perhaps the most significant difference between this section and the previous sections on knowledge and politics is the lack of polarization. When I interviewed both industrial and ecological farmers, they had much to say about the epistemology and politics of their counterparts. The quotes from farmers in this genre made up the empirical basis for the subsections titled *Industrial Farmers' View of Ecological Agriculture's Epistemology and Politics* as well as the converse. Whereas the sections on practices and discourse laid out the logics of ecological and industrial agriculture, the sections on how farmers understood their counterparts laid out the argument for polarization. In these sections, we see how important it is for logics to define themselves against other logics.

The same was not true for economics. Although some ecological farmers were critical of the reliance among industrial farmers on farm credit, this criticism extended across the spectrum of farmers. Furthermore, although some industrial farmers were critical of the price

premiums of products with organic labels, they nevertheless respected the farmers who grew such products. Indeed, beyond these two issues, there were no other criticisms from ecological or industrial farmers regarding the economic practices and perspectives of their counterparts. Rather, farmers across the board recognized the entrepreneurial drive and hardworking nature of their fellow farmers.

That is not to underplay the radical divergences between the economic systems of ecological and industrial agriculture. The scale, methods, and worldview of the economic systems of ecological and industrial farmers were as opposed as the knowledge and political systems of the respective logics. However, although the details of respective economic systems of ecological and industrial farmers deviated from one another significantly, the underlying logic remained remarkably similar. Whether operating within the logic of industrial or ecological agriculture, the farm represents a localized attempt to earn a profit in the face of countervailing global and historic pressure. Furthermore, divergences that do exist happen both within and across the supposedly polarized spectrum from ecological to industrial agriculture. Economic practices and perspectives are as fragmented within the supposed poles as they are divergent between them.

In this section, I discuss the fragmentation and compatibilities between the economic systems of ecological and industrial farming. On the level of the individuals involved, farmers across the agricultural spectrum embrace an entrepreneurial perspective toward the world. In an embrace of the American values of meritocracy and self-sufficiency, both ecological and industrial farmers valued the hard work of farming and thought that it would ultimately pay off.

Furthermore, both ecological and industrial farming should be seen as a localized exercise of agency in the context of historic and global structures that limit what farmers can do.

| <b>Table 4. Typology of Economics Among Farmers</b> |   |  |
|---|---|--|
|   | Industrial Agriculture  | Ecological Agriculture   |
| Polarized   | <ul style="list-style-type: none"> <li>• Grain storage &amp; financial instruments</li> <li>• Non-farm income</li> <li>• Keep it in the family</li> </ul> | <ul style="list-style-type: none"> <li>• Sell directly of customers</li> <li>• Increase price through quality</li> <li>• Entrepreneurship mentality</li> </ul> |
| Fragmented  | <ul style="list-style-type: none"> <li>• Some identify as Democrats (uncommon)</li> </ul>   | <ul style="list-style-type: none"> <li>• Some consider themselves progressives, others libertarians</li> </ul>   |
| Overlapping   | <ul style="list-style-type: none"> <li>• Recognition of global and historic forces, but recognize their own ability to exert local agency</li> </ul>      |  |

#### 4.3.1 Fragmentation in the Economics of Ecological and Industrial Farmers

Although polarization in agricultural economics is not as marked as the polarization in knowledge and politics, it is worth noting that there are significant variations in economic approaches between farmers. This is true both within and across the logics of industrial and ecologic agriculture.

The techniques discussed in the previous section on economic practices of industrial farmers are not utilized by all industrial farmers. For the most part, the variation in utilization of the various economic practices of industrial farmers comes down to the individual farmer's ability to marshal the capital resources necessary. That is, although a wide range of farmers practice under the logic of industrial agriculture, not all are large enough to utilize the effective economic strategies of the larger farms. Smaller industrial farms with fewer capital resources cannot take advantage of the economic benefits of grain storage. Many are often forced to sell

their grain immediately after harvesting, often at some of the lowest prices of the year. Of course, this often prevents them securing loans of any reasonable size that would be needed in order to expand, creating a situation in which they are left further and further behind their larger agricultural neighbors.

Likewise, not all ecological farmers utilize the techniques that were discussed in the section on the economic practices of ecological farmers. In this area, ecological farmers are perhaps even more fragmented than their industrial farming counterparts. Some ecological farmers prioritize the legitimacy conferred by the organic certification label. Having invested in the legitimacy of the organic certification process, these farmers often argue that it is the best way to ensure that farmers are following the logic of ecological agriculture. In my experience, the farmers that attain an organic certification typically are larger, have more capital resources, and access a broader market. Smaller farmers with fewer capital resources to invest in organic certification tend to question the extent to which an organic label truly measures the adherence of a given farm to the logic of ecological agriculture.

This fragmentation in economic practices among farmers mirrors larger patterns of wealth inequality in the United States. There seems to be growing sentiment among the U.S. population that the American Dream is defunct. Despite being told that hard work and smarts can lead to riches in the land of opportunity, many see the wealthiest families commanding increasing proportions of wealth and power. This was certainly true among the farmers that I interviewed. Whereas some of the industrial farmers I interviewed controlled upwards of ten thousand acres, others had merely hundreds. Likewise, whereas some ecological farmers had large operations with dozens of employees and significant capital resources from wealthy

investors, others were simple “mom-and-pop” operations run out of the backyard or an empty nearby lot.

I should be clear that none of the farmers I interviewed were eager to start a revolution to seize land and capital from the wealthy. Regardless of any perceived notions of inequality in access to agricultural resources, farmers remained staunchly anti-revolutionary. As we will see in the next section, farmers tended to react to the global trends they witnessed by focusing on their local environment (both to their benefit and to their detriment). Still, farmers from both the ecological and industrial logics recognized the increasing difficulty of making a living as a small farm.

One additional way in which farmers were fragmented in terms of their economic practices is related to agri-tourism. In recent years, farmers have leaned into public ideas about farming lifestyles in order to entice tourists to visit their farms for the novelty of witnessing a cow give birth or of riding a hay wagon. Some industrial farmers even intentionally damage their own corn crops to create mazes that people pay to walk through. Eight of the industrial farmers and six of the ecological farmers that I interviewed have some form of agri-tourism as a part of their business. In many ways, it is similar to other practices in which farmers utilize the tools of their farm to make non-agricultural profits. Whereas some farmers use their skills and resources to flip real estate or haul junk, others have petting zoos or corn mazes.

The distinction between farms that engage in agri-tourism and those who do not may not seem like a significant one. However, the difference came to my attention when I asked Paul if he was interested in doing any agri-tourism on his farm. Paul’s farm is located in

Southeast Michigan among beautiful rolling hills. His main business is a pasture-based beef operation in which he raises heritage cattle with picturesque coats and long horns. In other words, his operation would be ripe for farm tours and local tourists. Instead, he said, “I’m a farmer. That’s what I do. I’m not a tour guide.”

In an otherwise very friendly conversation, Paul suddenly became fairly serious. I had not expected him to react in this manner to my question and quickly moved on to other topics. I found his response to be telling, however. Across the board, the farmers I interviewed were friendly – incredibly generous with their time and willing to answer all my questions. Of course, these are also people who work long hours doing physically challenging labor. Many of the farmers I interviewed, both ecological and industrial, might be described as gruff or even intimidating. Even with the benefit of growing up in proximity to these types of farmers, I occasionally found myself a bit daunted in the face of a particularly surly interview.

These farmers take their jobs very seriously. What I learned from my interview with Paul and with many other farmers is that agri-tourism can sometimes feel as if the agricultural field is being belittled. It is as if by asking if Paul had considered incorporating an agri-tourism aspect to his farm, I was telling him that his farm was only valuable as a curiosity – a novelty interest for city folk to stop by and gawk at. It seemed to me that some farmers thought that by engaging in agri-tourism, they would be limiting the extent to which they could devote themselves to the very serious business of feeding the world. As demonstrated by the quote from Paul (an ecological farmer), this was true both for ecological farmers as well as industrial farmers.

These variations in economic approaches demonstrate that despite the significant differences between ecological and industrial farming, neither side is a monolith. Variations in resources and outlook alter the economic approaches of different farmers, whether they operate within the logic of ecological or industrial agriculture.

#### 4.3.2 Overlaps in the Economics of Industrial and Ecological Farmers

Although there were differences both across and within the spectrum of economic practices and perspectives from ecological to industrial agriculture, there were also many overlaps and congruencies. Across the board, farmers value an entrepreneurial mindset. Whatever criticisms farmers have of political ideologies, knowledge systems, or wealth inequality, they all embraced the quintessential American values of hard work with a positive purpose. In addition, both industrial and ecological farmers saw themselves as operating within a local environment while responding to global and historic pressures. In this way, farmers recognized their place as agents of history while acknowledging the limits to their own actions imposed by structural forces.

Farmers across the agricultural spectrum often complained about the difficulty of making money as a farmer. At the end of the day, farmers recognized that it was unlikely that they would ever become fabulously wealthy in the field of agriculture. Despite significant grumbling on this score, farmers valued the entrepreneurial mentality required of farmers. The hardships imposed by agricultural economics were embraced by farmers across the agricultural spectrum as a necessary price for their agrarian lifestyles. Furthermore, although farmers recognized that significant variation exists between farmers in terms of access to financial

resources (as mentioned in the previous section), this recognition did not seem to coalesce into a feeling of unfairness. Rather, farmers thought that even the wealthiest farmers were smart businesspeople who had achieved success through hard work and shrewd business maneuvers.

This respect for the entrepreneurial nature of farming reveals a foundational overlap in the economic outlook of all farmers. In some ways, farming is one of the most fundamental human enterprises. Raising crops and livestock in order to feed oneself and one's neighbors is what allows for everything else in a society to occur. Partaking in this time-honored and fundamentally necessary activity imparted a deep sense of purpose upon the farmers that I interviewed. Whether they operated under the logic of ecological or industrial agriculture, farmers embodied a sense of capability, assurance, and quiet confidence.

In some ways, the term entrepreneurial is too narrow for the dynamic that I seek to describe here. It is not simply that farmers thought that they could take risks, invest in opportunities, and hope for a positive financial return. Rather, the farmers I interviewed were remarkable in their underlying perspective on the world that allowed them to be entrepreneurial. That is, because farmers interact with the natural world in such a primal and direct manner, they often felt more confident in their position in the world than many of the non-farmers I have interacted with. Although most of them knew that they would likely never be able to purchase an expensive new car or take long vacations, they felt a deeper sense of assurance in their long-term capacity to survive.

Of course, this did not necessary mean that farmers thought their farms would last forever. On the contrary, many of the farmers I interviewed said they would be surprised if



their farms lasted two generations beyond themselves. What farming gave to farmers was a sense that they would be able to provide for themselves no matter the circumstances. By being so firmly attached to the process that provides the basic building blocks for civilization, farmers thought that they were unlikely to be forced into starvation. In solving the day-to-day challenges of farming, farmers thought that they had the wherewithal and problem-solving skills to succeed in whatever enterprise they might be forced into. In building a work ethic necessary to sustain a farm, farmers thought that they could out-work any city slicker they might have to compete against. In this way, the humility and groundedness that farmers embodied was counterbalanced by a fundamental sense of competence, surety, and agency.

An important aspect of the sense of fundamental agency that farmers felt was that it is a fundamentally local response to global forces. Farmers recognized that the skills and work ethic they brought to their work was a response to global demands and historical pressures far beyond their control. That is not to say that farmers did not engage on a political level. As we saw in the previous chapter, industrial farmers often thought that a more-conservative foreign policy combined with continued support for domestic agriculture would allow farmers to flourish. Conversely, ecological farmers thought that the U.S. government had done too much to encourage bad behavior among industrial farmers, both at home and abroad. In response, they proposed a wide range of progressive policies to encourage the adoption of the logic of ecological agriculture.

What must be kept in mind, however, is that despite their vocal support for opposing agricultural policies, ecological and industrial farmers ultimately thought that they were most able to exert their own agency in the local setting. The unique sense of agency that farmers felt

was not over global trends, whether political or climatic. Rather, farmers of all stripes perceived global events and responded to them in their local environment. For industrial farmers, perceptions of long-term demands for biofuels were responded to by doubling down on the ability to plant and harvest corn. For ecological farmers, perceptions of global environmental damage were responded to by actively seeking a more harmonious interaction with the natural environment.

In this context, a farmer said to me, “You plant a tiny seed, and you wait. In a couple months, you’re eating the food from that plant that the seed grew into. The first time you see that happen is magic.” The fact that farmers take the magic of that individual event and multiply it until it becomes a business enterprise capable of sustaining entire populations is exponential magic. By interacting with this magic on daily basis, farmers develop a deep sense of agency. Perceiving global trends and patterns, farmers respond where their agency is most powerful – their immediate environment.

#### 4.3.3 Summary: Overlaps & Fragmentation in the Polarization

The economics of agriculture are challenging. For industrial farmers, the forces that determine their bottom line include geopolitical posturing, global weather events, and historic trends toward increasing production and farm consolidation. For ecological farmers, relatively small volume must be responded to through taking a larger percentage of the customers’ food dollar and attempting to increase the price by loading their products with the value of ecological production. For farmers across the agricultural spectrum, despite significant differences in approach, the ultimate goal is to earn a profit through raising and selling crops and livestock.

Regardless of whether a farmer practices under the logic of ecological or industrial agriculture, this fundamental similarity results in common perspectives and attitudes.

# Chapter 5: Conclusion

## 5.1 Farming in Flyover Country

What does it mean to farm in flyover country? Every day, farmers around the world perform the labor necessary to feed and clothe both themselves and the non-farming population. Doing so implies long hours and tight profit margins. Ultimately, farmers are dependent upon the multitude of non-human organisms that make farming possible. As a result, the lives of farmers are complicated by the vagaries of nature, the challenges of unpredictable weather, and the complexities of biological systems. In doing this vital and challenging work, farmers occupy a position that can feel archaic in a world of technological marvels and fabulous media worlds. To farm in flyover country is to reject the glamour of the modern, coastal, urban life and embrace the necessary labor and simple pleasures of the heartland, traditional, agricultural one. To those who fly over this place, it appears as little more than endless farm fields, merely signifying an obstacle to be overcome between the liveliness of coastal environs. To those who live in this place (including this author), it is home; a place where everything important in life happens.

This is true for farmers of all varieties. For farmers who fall closer to the industrial end of the spectrum, the responsibility of feeding the world is paired with a rural-populist worldview that rejects the supposed superiority of coastal elitism. For farmers who fall closer to the ecological end of the spectrum, the environmental destruction wrought by industrial agriculture is only a fraction of the damages caused by the modern world. In this way, farmers around the world are farming in flyover country. Still, the inflection of these dynamics is

particular in the United States and especially in the state of Michigan. Mirroring the polarization that has become endemic to American politics, the field of agricultural production is characterized by opposing institutional logics.

In many ways, the logics of ecological and industrial agriculture are as polarized as any opposing perspectives in American life. Whereas farmers who operate under the logic of industrial agriculture seek to mimic the mechanized systems of a factory, farmers who operate under the logic of ecological agriculture seek to mimic the dynamic systems of the natural world. Industrial and ecological farmers have vastly different epistemic, political, and economic approaches, and often define themselves by their opposition to their counterparts.

Although the conflict between the logic of ecological and industrial agriculture is an essential characteristic of the field, there is also fuzziness within the polarization. Although farmers typically fall fairly neatly into a typology of ecological and industrial farmers, there is both variation within each group and overlaps between the two. Furthermore, farmers define their logics as much by how they are opposed to their counterpart logic as they define them by how they are internally consistent. In this way, the logics of ecological and industrial agriculture are reliant on the conflict between them for their very existence.

This conclusion will review the major findings from each of the previous empirical chapters. First, the findings that support the polarization thesis will be reviewed and discussed. Subsequently, I will review and discuss the findings that lay out evidence for the fuzziness within the polarity. The conclusion will end with recommendations for policies that would be

fruitful for farmers of all varieties and for the population at large and suggest future avenues of research.

### *Polarization*

In many ways, the farmers that were kind enough to participate in this study were as different from one another as any two groups can be. From the prevalence of pandemic-precautionary masks to the choices in clothing to the cadence of the conversation, farmers fell fairly neatly into the typology of ecological and industrial logics. Whereas ecological farmers were inspired by impact science, leaned toward progressive politics, and focused on high-quality, local food, industrial farmers depended upon production science, tended to be quite conservative politically, and built their economic systems around high quantities and global markets. The particular dynamics of these polarities provide new insights for the literature on polarization.

Perhaps the most directly polarized area between the logics of ecological and industrial agriculture is knowledge. Criticisms from farmers of all varieties paint their counterparts as “anti-scientific.” On the one hand, industrial farmers are criticized for ignoring their contribution to climate change and for damaging human health, enacting a form of denialism that goes beyond climate change to encompass a broad range of skepticism toward expertise. On the other hand, critics of ecological farmers point out that genetic modification is a cutting-edge science with a mountain of studies demonstrating the safety of the technology. Industrial farmers often pointed to the need to feed a growing global population as a justification for the advanced technological tools they use in their practice. For them, choosing to farm in a “less efficient” manner is a formula that leads to mass starvation.

The literature on polarized agricultural science articulates a contrast between the centralized, industry-generated, and industry-supporting science of industrial agriculture with the diffuse, farmer-generated, and farmer-supporting knowledge systems of ecological agriculture (Kloppenber 1991; Kloppenber et al. 2000; Kinchy 2010a). The STS literature on symmetry also suggests that in understanding how particular scientific findings become accepted, social factors must be considered alongside the strength of evidence and other technical factors (Bloor 1976; Sismondo 2017). The findings of this project suggest that scientific findings can find a home in a broad range of settings. Within each logic, science is used both as a generative tool to build techniques and perspectives and as a weapon against the competing perspective. Both ecological and industrial farmers accuse one another of being “anti-science” and argue that their perspectives are rooted in true science. When considering the adoption of new scientific findings or technologies, it is as central to understand how they fit into existing institutional logics as it is to understand their evidential basis.

The use of science as a rhetorical tool is, of course, also inflected by agricultural politics, which are also quite polarized. With a couple of notable exceptions, industrial farmers tended to be politically conservative whereas ecological farmers tended to be politically progressive. The dynamics of this polarized conflict played out in farmers’ relationships to one another and to society at large, as well as in the context of particular policies and organizations. On the level of interpersonal relationships, industrial farmers who identified as both men and women tended to value traditional gender roles, whereas ecological farmers presented a more egalitarian approach to gender. In terms of their views of society, industrial farmers presented a traditionally conservative mentality, arguing for small government and less interference in

their lives. However, they also supported federal and state policies that provide financial assistance to farmers. Conversely, ecological farmers tended to be critical of policies they labeled “farmer welfare” while calling for more government regulation in the practices of industrial farming. Finally, whereas industrial farmers were highly critical of the ideas and tactics of movements such as Black Lives Matter and Antifa, as well as the supposed support of such movements by the Democratic Party, ecological farmers were highly critical of many of the Trump administration’s policies, particularly the harsh practices at the Southern border and the direct support to farmers that arose from the administration’s trade war with China.

These divisions mirror the patterns and contradictions of the mainstream political contest in the United States. On the one hand, the conservatism of industrial farmers comes from a deep respect for what they understand to be valued traditions and proper behavior. Although critics would point out that such traditions tend to protect the interests of those already in power, a self-conscious desire to maintain such power does not appear to be a sufficient explanation for the persistence of such beliefs among conservatives. Rather, as indicated by Metz (2018) and others, it tends to be the case that conservatives will defend their perspectives even when it hurts them directly. Although scholars including Hochschild (2018) and Wuthnow (2019) argue that this sense of duty and moral steadfastness has been manipulated by conservative elites to further concentrate wealth and power, the results from this project indicate that these issues also need to be understood from the perspectives of the those who embrace them. Industrial farmers desire a sense of righteousness and strive to be good people. Their politics are an outgrowth of this striving and their position in society.



On the other hand, the politics of ecological farmers tends to be consistently critical of dominant institutions and structures of power. That it was so much easier to recruit women ecological farmers demonstrates the rejection of traditional conceptions of power that is embraced within the logic of ecological agriculture. For ecological farmers, women are essential members of the farming community and are necessary for the success of the agricultural endeavor. Support for progressive social movements and criticisms of conservative policies (from both Republican and Democratic administrations) are further examples of the system-challenging logic of ecological agriculture. As a logic that is challenging the dominant paradigm, it makes sense for ecological farmers to challenge a broad range of structures. However, by questioning such a scope of institutions, it remains a challenge for ecological agriculture to find a firm foothold in achieving its goal of becoming the dominant logic in the field.

The area that was least polarized between the logics of ecological and industrial agriculture was economics. Still, although there were relatively few direct assaults on the economics of either logic, there were some differences. Whereas industrial farmers participate in a global market of measured volumes and qualities, ecological farmers engage in their immediate geographic vicinity and seek unique methods to convince customers of the quality of their products. Interestingly, whereas industrial farmers utilize local conditions such as soil type and climate to compete for market share on the global scale, ecological farmers utilize global conditions such as ecological destruction and damaged health to compete for local dollars from consumers who are concerned about such conditions.

The polarized economics of ecological and industrial agriculture again mirror larger trends. The fight for dominance in global food production is an essential part of the forces of

globalization. That American industrial farmers are concerned about the size of the hog population in China and the amount of rain in Brazil demonstrates the on-the-ground impact of international trade agreements and supply chains that circle the globe. Conversely, the desire to produce and consume local food is emblematic of the international resistance by the discontents of globalization. As a growing number of people recognize the downsides of a global economic system, they turn to their neighbors for the necessities of life. Although the localization of healthy food can lead to concentrations in inequality as suggested by Guthman (2014), it also has the potential to be liberatory, as in the case of the urban farmers I interviewed in Detroit and Lansing, who utilize the logic of ecological farming to generate an inclusive and decentralized method to sustain their communities.

In summary, although there is considerable evidence for polarization between the scientific and political dimensions of the industrial and ecological logics, it is also remarkable how *unpolarized* the economic aspects of these two logics are. When discussing knowledge and politics, farmers often defined themselves against their counterparts, but when discussing economics, farmers almost universally applauded the business acumen and hard-working attitudes of farmers of all varieties. In some ways, the important part of this finding is the polarization. The depth of polarization among Michigan farmers is a microcosm of a society that is becoming increasingly divided into two groups, defined as much by their opposition to the other group as their intergroup allegiance. However, the lack of polarization along the economic dimension is important both in what it implies about how we might reduce polarization in American culture and politics and the question it raises about the particularities of the economic realm when compared to the epistemic and political arenas. The implications

of this finding for the goal of reducing polarization will be explored in the following sections. As far as what these findings reveal about the particularities of the economic realm, what becomes clear is that the logics of ecological and industrial agriculture ultimately share a foundation in American ideals of entrepreneurship and hard work. Combined with other areas of fuzziness amidst the polarity, these results provide useful insight to our understanding of these dynamics.

### *Fuzziness*

That the field of agricultural production is polarized should not surprise any readers of this study. The particular dynamics of polarization of this case add somewhat to our understanding of the phenomenon, but the fuzziness within and between the poles is both the central agenda of this project and, I believe, the most significant contribution that it makes. Although the field of agricultural production is polarized along several dimensions, polarization is not its only, or even its defining feature. Rather, despite farmers' tendency to define themselves in opposition to the logic of their counterparts, the logics of industrial and ecological agriculture are both internally fragmented and mutually overlapping.

In terms of the knowledge systems that farmers build their practices from, there are many divisions for both industrial and ecological agriculture. Perhaps the most impactful fragmentation among industrial farmers is the variation in which farmers approach the issue of climate change. Whereas some industrial farmers doubted the reality of climate change (trend skepticism), others questioned either the dangers of climate change (impact skepticism) or that humans were to blame for climate change (attribution skepticism). In particular, industrial

farmers were quite critical of the blame for climate change being attributed to their agricultural practices, as opposed to the activities of all other sectors of society. Furthermore, ecological farmers were also fragmented in their approach. Whereas reformist ecological farmers tended to suggest interventions including no-till, cover crops, and organic methods, revolutionary ecological farmers demand a more dramatic overhaul all aspects of the industrial agriculture system of knowledge creation. Critics of the reformist perspective say that such a perspective manifests what I have called “severity skepticism” by failing to realize the gravity of the situation at hand. Conversely, critics of the radical perspective argue that by throwing out all positive outcomes of modern science, radical farmers are manifesting what I have called “solutions skepticism.”

Despite these internal divisions within each agricultural pole, there are also significant overlaps between the two. Ecological and industrial farmers have vastly different systems for appraising information from outside sources but are very similar in that the ultimate test of new techniques or knowledge is how it works on their farm. In that way, farmers of all varieties consider farming to be akin to a craft and perfection in the agricultural craft necessitates long years of direct contact with the tools of farming in a particular geographic location. This sense of the superiority of direct experience also manifests in a general sense of epistemic populism. Whatever the qualifications of a non-local may be, farmers consider the knowledge they generate on the farm and the knowledge of their neighbors to be of paramount validity.

Epistemic populism also tends to extend to political populism among farmers of all varieties. Although industrial farmers tend to aim their skepticism at government officials and ecological farmers tend to be critical of large corporations, both are critical of distant, powerful

entities. Farmers of all varieties tend to favor a form of political decision-making that could be described as local, decentralized, and democratic. Related to the desire of farmers for a more-decentralized political apparatus is a common feeling among farmers of rootedness and connectedness to a community. Both ecological and industrial farming occur in a particular place. Farmers come to know the land that they work on and in with an intimacy that they take very seriously. Furthermore, this rootedness in their work typically confers a sense of belonging to the community in which their farm is located. By being geographically constrained in the practice of agriculture, farmers often live in the same community for multiple generations, coming to value their place within it and the benefits of living in that community.

The overlap between ecological and industrial farmers in their desire for decentralized decision-making and populist politics is mirrored in divisions within each pole in terms of specific policies and political affiliation. For industrial farmers, some variation exists in the extent to which federal supports for agriculture are considered valuable and necessary. Whereas some more conservative-minded industrial farmers consider such support an unnecessary and damaging government intervention, others consider it a reasonable concession to an otherwise small-government stance. For ecological farmers, criticisms of industrial agriculture can exist within multiple political identities. The political populism that ecological farmers often embody sometimes manifests in a fairly radical progressive vision of democratic governance of the food system and other times manifests in a libertarian, anti-government stance. The next time you attend a farmer's market, you should expect to see a fair amount of Bernie Sanders bumper stickers, but you also should not be surprised by the presence of one or two MAGA hats.

In economic terms, I have already discussed the extent to which the logics of ecological and industrial agriculture are not polarized in the economic realm. In the arenas of knowledge and politics, the two logics often define themselves in opposition to one another. Conversely, the economics of ecological and industrial agriculture are notably *unpolarized*. Not being polarized is not the same as being fragmented or overlapping, however, and there are meaningful areas where the economics of ecological and industrial agriculture demonstrate fuzziness. For example, the economic practices of both industrial and ecological farmers are constrained by the socioeconomic stratification within each pole. Industrial farmers with more capital are able to command a larger proportion of the supply chain by building storage capacity and technical abilities beyond the means of smaller industrial operations. Likewise, larger ecological operations benefit from economies of scale in a way that some smaller-scale farmers argue makes them less principled.

Although this fragmentation within each pole exists, farmers ultimately respect each other's business acumen. Farmers of all varieties tended to attribute the success of other farmers to their ability to work hard and make smart business moves. Moreover, the techniques that farmers used to increase profits were similar in that they tried to increase their presence within the supply chain and maximize the value of their capital. For industrial farmers, this meant the building of storage and harvesting equipment and the use of commodity futures. For ecological farmers, this meant selling directly to customers and keeping as much on-farm supplies as possible. For ecological farmers, the utilization of on-farm supplies (e.g., fertilizing soil with animal waste or compost) contributed to the bottom line both in the sense that it cuts costs, and it commands a higher price from consumers who value farm sustainability. For

industrial farmers, this practice was mirrored in the in-housing of necessary maintenance activities and the utilization of farm capital (both equipment and human) for off-farm enterprises.

These areas of fuzziness complicate the story of polarization as typically understood. As with any typology, the logics of ecological and industrial agriculture represent a constellation of ideas that individuals tend to group around, rather than a strict doctrine that must be adhered to. Whereas the contrast between the two helps to define the outlines of each, the fuzziness of the poles demonstrates the diversity of the members of each group, the mutual foundation upon which both logics stand, and the potential for beneficial synthesis beyond the polarization. By seeing farmers as individuals that are shaped, but not determined by the logic in which they operate, they become more human, and as such, more worthy of respect and understanding. Likewise, if we understand where the logics of ecological and industrial agriculture overlap, a conversation can be had in which interlocutors can communicate, rather than talk past one another to their own tribe. Hopefully, such conversations can lead to the benefit both the producers and the consumers of food.

## 5.2 Contributions to the Literature & Future Research

The findings of this project contribute in myriad ways to the conversation about the dynamic competition between the logics of ecological and industrial agriculture. For environmental sociologists, this project adds to the conversation about climate change denialism by both refining our understanding of traditional denialism and expanding the definition to include a broader range of perspectives. Likewise, for researchers of food and agriculture, these findings

add to our understanding of how the structure of agricultural knowledge contributes to polarization between farmers while also suggesting potentially useful collaborations. This study also contributes to our general understanding of how conflicting institutional logics both compete with one another directly and rely on each other for their existence. Finally, by building a deeper understanding of the conflict between ecological and industrial farmers, this project contributes to our general understanding of the extremes of American polarization as well as the nuances within that polarization. Although this project contributes significantly to all these areas of research, it also provides a useful foundation for future research to build upon.

The anti-reflexive nature of climate change denialism among political conservatives in the United States is clear (McCright & Dunlap 2010). The conclusions of environmental and climate scientists must be acted upon in order for modern institutions to be turned back upon themselves and become sustainable (Mol & Spaargaren 2000). In the polarized conceptualization of American politics and agriculture, industrial farmers are accused of climate change denialism both in their professed ideas and their everyday behavior. The findings of this project contribute to this understanding by further emphasizing the varieties of climate change *skepticism* and elucidating the details of how such skepticism manifests among industrial farmers. Industrial farmers do not simply deny the validity of climate and environmental science, but rather use a variety of strategies to minimize the extent to which their own practices are threatened by such science. Although industrial farmers were directly skeptical of the trend, impacts, and attributions of climate change, their main skepticism was of the politics of climate change and environmentalism. That is, farmers find ways to be skeptical of climate and environmental science because they find the bearers of such science to be in cahoots with



a political agenda with which they disagree. Cynical explanations of this phenomenon suggest that farmers are merely protecting their wealth, power, and identities (McCright & Dunlap 2011). Although this is certainly part of the story, this phenomenon must be understood from the perspectives of the farmers themselves. The findings of this study suggest that industrial farmers resent and reject accusations from distant (urban, liberal, coastal, etc.) others that they perceive as being ignorant about the particular activities of modern farming. Future research should explore the drivers of the variation among industrial farmers in climate change skepticism and seek methods for cultivating allegiances across political divides in order to effectively communicate climate and environmental science to farmers.

In addition, the findings of this project build on the work of Kari Norgaard (2011) and others in expanding the definition of climate change denialism beyond the political right. On the one hand, the more radical wing of the ecological agriculture movement suggests that agricultural politics that do not revolutionize the production of food and fiber are committing *severity skepticism* by denying the severity of the climate crisis and concomitant need for drastic changes. On the other hand, more reform-minded ecological farmers argue that by discarding tools of modern agriculture such as precision technologies and genetic modification, the radical wing manifests a *solutions skepticism* that denies the benefits of such tools. This contrast demonstrates that rather than a simple understanding of reflexivity and anti-reflexivity, we should understand reflexivity itself to be contested. Indeed, the perspective of solutions skepticism is held by nearly all industrial farmers who argue that methods such as organic agriculture seek a less efficient method of agricultural production. From the perspective of industrial farmers, by rejecting techniques and findings of modern science, it is the logic of

ecological agriculture that is anti-reflexive. Future research should examine how different logics of modernity are marshalled in different political and social contexts in order to create alternative constructions of reflexivity. Furthermore, future research should explore areas of overlap such as cover crops and no-till to understand how these issues both succeed and fail to generate mutually-understood conceptions of reflexivity.

For scholars of the sociology of agriculture and food as well as of science and technology studies in the agricultural setting, this project provides several innovations. Scholars of alternative agriculture have proposed several definitions of the movement and its goals (Beus and Dunlap 1990; Kloppenburg et al. 2000). In this project, the logic of ecological agriculture, which is embodied in the alternative agriculture movement, is contrasted directly to the logic of industrial agriculture. By doing so, the contours of each logic are made clearer in their contrast to one another. Whereas the logic of ecological agriculture is informed by the epistemology of impact science, the logic of industrial agriculture uses production science as its epistemic foundation. As such, accusations of “anti-science” are hurled and rebuffed by members of each side. Given the expansive scientific work conducted by each side, such accusations are ignored as both spurious and ignorant. Future research should continue to dig into the ways in which science is used by competing institutional logics to consolidate internal agreement and create external contrast.

In addition to the polarization between ecological and industrial farmers, the findings of this project also emphasize the fuzziness within the polarization. The politics and knowledge systems of farmers across the board are fundamentally rooted in a populist worldview and aesthetic that favors decentralization and community-based political and economic systems.

Ecological and industrial farmers may differ in who they find to be the ultimate boogeyman in the federal and international system (large corporations vs. intrusive governments), but they agree that more power should reside in the hands of community members. On the one hand, this emphasis on decentralization confers power to individuals and communities to make decisions that are right for them. On the other hand, decentralized decision-making can also confer more power to those who already have it within geographic areas and lead to increased stratification between communities. Future research should continue to explore the contradictions of decentralized political and agri-economic systems.

This project also contributes to our understanding of the dynamics of competing institutional logics. This project easily could have conceived of these dynamics within the vocabulary of social movements. However, by conceptualizing the present debate as a contest between competing institutional logics, each side is understood as active agents with semi-cohesive worldviews and differential levels of power. In addition, while the concepts of the institutional logics literature help to define each logic by their contrast with their counterpart, this project also argues for a slight variation in the way that competing institutional logics should be understood. Research in this area has emphasized either the forces that contribute to the displacement of one institutional logic by another (e.g., Beerman 2015) or the factors that contribute to the coexistence of multiple logics within an organizational field (Reay & Hinings 2009). Here, I have focused on the extent to which competing institutional logics rely on one another for their existence. This is particularly true for challenger logics, such as the logic of ecological agriculture, which are entirely predicated on a critique of the incumbent logic. However, incumbent logics also utilize contrasts with challenging logics to consolidate internal

agreement. When analyzed from within the logic of industrial agriculture, the logic of ecological agriculture is seen as internally contradictory and externally illogical. Making this contrast explicit re-asserts the value and truth of the logic of industrial agriculture, further perpetuating the contest between the two logics, which then further reinforces each individual logic. Future research should continue to examine the factors that allow logics to reinforce one another through competition and ultimate longevity of such a competition.

The final area of scholarship that this project contributes to is research on American polarization and particularly of conservative rural Americans. The literature in this area emphasizes that conservative politicians have historically leaned on hot-button cultural issues to garner support in rural communities and subsequently pass neoliberal economic policies that ultimately harm such communities (Frank 2004; Hochschild 2018; Metzl 2018). Importantly, scholarship has also argued that positions on cultural issues such as opposition to abortion and gay marriage are manifestations of group identities, rather than strongly-held policy positions (Wuthnow 2019). The literature on polarization more generally demonstrates that political identity has come to increasingly define an encompassing set of beliefs, such that cross-cutting opinions have become less common (DellaPosta 2020). This project agrees with these assertions, but also argues that the relationship between political identity and opinions on cultural, economic, and social issues is omni-directional. Progressive beliefs about reproductive and LGBT rights have become inextricably linked with an expanded social safety net. Likewise, conservative beliefs about gun ownership and religious freedom have become entrenched with free market ideology. As Metzl points out conservatives who “vote against their own interests” do so not because they necessarily intend to harm minorities, but because they believe they

seek to uphold a political and economic system they consider to be fair.<sup>36</sup> However, these perspectives must be understood as part of a largely coherent worldview in which political actors on all ends of the spectrum see themselves as the “good guys.” In the context of future research on the agri-food system, more work needs to be done to understand the consistencies and contradictions within the political logic of both industrial and ecological agriculture, and how environmental consciousness might exist within a the widest possible range of political worldviews.

On the ecological side of the spectrum, internal divisions provide intriguing suggestions about the internal coherence of the logic of ecological agriculture. That fervent Trump supporters and self-professed libertarians coexist in the sphere of ecological agriculture alongside radical communitarians and avowed socialists attests to both the ideological permissiveness of the logic of ecological agriculture and the non-mutually-exclusive nature of political ideology more broadly. The radical differences in political ideologies among existing ecological farmers suggests that the logic of ecological agriculture might find support among a larger portion of the population than previously imagined. It also suggests that the alternative agriculture movement will continue to contend with actors with divergent agendas. Future research should examine the factors that allow for the coexistence of such politically-divergent members within the logic of ecological agriculture and how such political diversity affects the outcomes of the movement.

---

<sup>36</sup> Of course, racialized ideas about who benefits from “unfair” welfare policies and progressive social movements are an essential part of resistance to them.

These suggestions constitute but a portion of the future research directions implicated by this project. As the effects of climate change and ecological destruction continue to develop, it will be important to follow the relative successes as well as the changing contours of the logics of ecological and industrial agriculture.

### 5.3 Policy Recommendations

The findings of this project imply several directions for policies. These recommendations come in two categories, each of which come with normative assumptions. The first set of recommendations seek to make the agricultural system a more sustainable one. This set of recommendations assume the validity of environmental and climate science that demonstrates the damages caused by the current industrial agriculture system and seeks to build a system that is both committed to producing healthier food and to being able to do so for the foreseeable future. The second set of recommendations seek to curb the polarization in American society. These recommendations assume that the polarization we currently see is directly harmful to the health of our society and the people in it. By curbing polarization and worst side-effects of it, I hope to contribute to a healthier and more vibrant society. I will conclude by discussing general implications of this research for polarization in the United States.

Perhaps the easiest and most impactful thing the government could do in terms of building a more sustainable agricultural system is to encourage the development of carbon markets for agriculture. In the last decade, companies including Nori and Indigo Agriculture have begun to measure the level of carbon sequestration created by practices including cover

crops and no-till farming. The long-term plan is to create a carbon market in which organizations that are dedicated to carbon neutrality can purchase offsets from farmers. This way, a strong financial incentive is created for farmers to practice sustainability.<sup>37</sup> In order for this system to work effectively, the government should *not* become directly involved in carbon markets, except in a regulatory capacity. Given the large percentage of Fortune 500 companies that have already made pledges for carbon neutrality, the involvement of the government in creating these markets would only discourage farmers from participating. Rather, the most useful role the government could play in the development of agricultural carbon markets is to fund research to build tools for assessing and recording the carbon sequestration of various agricultural techniques. Funding should also be provided for research on the relevant social factors and communication strategies that are most likely to encourage industrial farmers to adopt sustainable practices.

The reason that an agricultural carbon market is the easiest and most impactful policy that the government could employ is because it is the most congruent with the logics of industrial and ecological agriculture. For ecological farmers, incentivizing the removal of carbon from the atmosphere through beneficial agricultural practices aligns with the attempts to improve the environment associated with impact science, the need for political intervention advocated by many progressive ecological farmers, and the entrepreneurial spirit of ecological farming. For industrial farmers, the main alignment of carbon markets with the logic of industrial agriculture is the economic one. However, it also aligns with a political desire for the

---

<sup>37</sup> To be clear, carbon market should be considered one tool among many in the climate change mitigation toolbelt.

contribution of private businesses to climate solutions and with the sense that industrial farmers have of being stewards of the land. Together, this makes a strong case for carbon markets in agriculture.

The second, much more challenging task for policymakers would be to encourage and instigate a shift in the agricultural system toward the production of more food for human consumption. The current system is highly efficient at generating calories for livestock consumption. The energy costs of growing and harvesting the hundreds of millions of bushels of corn and soybeans from American fields would not be as environmentally destructive if the grain did not subsequently undergo processing into fuel or get fed to steers in a feedlot in order to eventually become calories on a human being's plate somewhere down the line. As many of the ecological farmers in this study pointed out, meat production is environmentally damaging because of its scale and concentration. Many ecological farmers argue that beef and other livestock raised on pastures as opposed to feedlots have the potential to be environmentally neutral, if not beneficial. Shifting the American agri-food complex toward one in which agricultural production is closer to food consumption and meat production is less concentrated is a monumentally complex task and one that will take decades of concerted policy effort. Short-term policy goals should include the funding of research on the life-cycle carbon emissions of various agricultural products (i.e., corn and soybeans vs. produce) and techniques (i.e, CAFOs vs. pasture-raised). Furthermore, policy-induced shifts in the dynamics of the agricultural landscape must consider the potential downsides for low-income agricultural workers and consumers. Programs need to be created to re-employ workers from the meat industry and offset the potentially-increased price of meat and other staples. Finally, funding



should be provided for research on how to encourage a wide range of publics to shift toward a more plant-based diet.

The challenge of implementing these goals is a result of them being somewhat conflictual with the logic of industrial agriculture. Industrial farmers are concerned with producing as much product as possible in order to maximize profits while feeding the world. Because the tools of industrial farming are geared toward these goals, simply converting to producing less corn and soybeans and more produce would not be an easy switch for most industrial farmers. Likewise, despite the long history of governmental intervention in agriculture, the dominant political logic of industrial farmers would balk when faced with the scale of intervention suggested. However, given the dominance of the economic logic within industrial farming, a large shift in consumer demand toward plant-based diets would likely instigate a change in farmers' behavior.

As the previous policy recommendations suggest, much work remains to be done to best implement a shift toward a more sustainable agricultural system. As such, my final policy recommendation in this area would be to encourage the younger generation of farmers to engage directly in these issues. This could be accomplished through the education system by increasing funding to high school Future Farmers of America (FFA) and 4-H programs and by providing scholarships for bachelor's and graduate degrees in agricultural fields. These funding increases should include a curricular environment that includes at least some of the logic of ecological agriculture. By exposing farmers of the future to the logic of ecological agriculture at a young age, they may be more willing to adopt such practices in the future. Furthermore, financial programs that encourage young farmers to enter agriculture such as the Beginning

Farmers and Ranchers program from the USDA should be expanded to allow for a new generation to enter the agricultural field without having to inherit property from relatives. Finally, all these programs should prioritize the participation of a diverse range of young people.

In terms of counteracting some of the political polarization that this study has demonstrated, my final policy recommendation to decrease polarization among American farmers is to utilize local Farm Bureau organizations to encourage interaction between farmers of all varieties. The Farm Bureau meetings that I attended were almost entirely populated by industrial farmers. If ecological farmers are interested in encouraging their neighbors to engage more with the logic of ecological agriculture, and if industrial farmers are interested in decreasing the stigma associated with industrial farming, engaging directly with each other is essential. Farm Bureau meetings typically involve a presentation given by a farmer. By alternating between ecological and industrial farmers, both will be exposed to alternative perspectives. Although this may not dramatically shift any individual farmers' behavior, it will encourage each side to recognize the validity and logic of the other, decreasing polarization and encouraging cooperation. One important way that the government could facilitate such interactions is to expand rural access to broadband internet in order to allow farmers to attend meetings virtually. Although in-person interaction remains the most powerful tool against de-humanization, the COVID-19 pandemic has revealed the strength of digital connections. These recommendations are not likely to dramatically change the competition between the logics of ecological and industrial agriculture. Ultimately, if the predictions of environmental and climate scientists continue to be proven correct, changes in farming conditions will force changes to

agricultural practices. However, if farmers are encouraged to head off some of these changes and the dynamics between ecological and industrial farmers become less polarized, the producers as well as the consumers of food would benefit.

The findings of this project come from the interactions I had with farmers over the course of data collection. However, if polarization in the field of agriculture serves as a microcosm of more general polarization, the findings of this project can also apply on a broader level. This project found that the knowledge and politics of farmers are defined in many ways by their opposition to one another, just as the identities of many Americans are defined by their opposition to their political opponents. Like farmers, however, American partisans are likely to be both internally fragmented and share overlaps across the polarity. Discussions about American political polarization that does not recognize internal variation and overlaps only serves to further intensify the polarization narrative.

Perhaps the most important lesson to draw from this project is the importance of personal connections that cut across party lines. Just as I encourage farmers to use local Farm Bureau meetings to reach across the spectrum of agricultural polarization, I encourage all citizens to find areas of mutual connection with those across party lines. For farmers, the mutual connection of the business of farming can cut through the forces of polarization. For the average citizen, participating in non-political activities with fellow community members may contribute to the re-humanization of political opponents. When we begin to see those we disagree with as members of families, workplaces, and communities, we may begin to heal the divide in this country.



# Appendix A: Participants

All names mentioned in this document are pseudonyms. In addition, participants were protected by only referring generally to the approximate size of participants' farms and their main products. Finally, the location of participants' farms was only mentioned in cases in which I found their location relevant (e.g., when the local geography affected their practices), and then only generally. In Table 5, you will find the pseudonyms for the participants, the size of operation they work on, and the type of products they produce.

| Table 5: Farm Size & Products |                           |   |
|-------------------------------|---------------------------|---|
| Name                          | Approximate Size in Acres | Products                                |
| Industrial                    |                           |   |
| Aaron                         | 10,000+                   | Row Crops                               |
| Alex                          | 200                       | Row Crops                               |
| Benjamin                      | 1500                      | Dairy                                   |
| Bill                          | 3000                      | Row Crops                               |
| Brad                          | 1500                      | Dairy                                   |
| Cassy                         | 150                       | Hops                                    |
| Dan                           | 500                       | Fruit; Row Crops                        |
| Danielle                      | 8000                      | Diverse Row Crops;<br>Ornamental Plants |
| Dave                          | 8000                      | Row Crops                               |
| Derrick                       | 10000+                    | Row Crops                               |
| Eric                          | 5000                      | Row Crops;<br>Cattle; Chicken           |
| Erica                         | NA                        | Industry Group                          |
| Gary                          | 10,000+                   | Row Crops                               |
| Glenn                         | 1500                      | Dairy                                   |
| Jennifer                      | NA                        | Industry Group                          |
| Jerry                         | 4000                      | Dairy                                   |
| Kevin                         | 500                       | Row Crops                               |
| Larry                         | 10,000+                   | Row Crops                               |
| Linda                         | 10,000+                   | Row Crops                               |

|             |      |   |
|-------------|------|---|
| Mark        | 8000 | Diverse Row Crops                                 |
| Randy       | 8000 | Row Crops   |
| Sally       | 150  | Horticulture                                      |
| Thomas      | 1000 | Sod   |
| Tonya       | 100  | Fruit Crops                                       |
| Ecological  |      |   |
| Adam        | 30   | Hops  |
| Amy         | 4    | CSA & Restaurant Produce                          |
| Anna        | NA   | Ag-Extension Professor                            |
| Cara        | 15   | Organic produce; Floriculture                     |
| Cheryl      | 25   | Farmstand Produce                                 |
| Christopher | 30   | CSA Produce                                       |
| Harriett    | 15   | CSA Produce                                       |
| Jake        | 15   | CSA & Subsistence Produce                         |
| James       | 15   | CSA Produce                                       |
| Jan         | 30   | Dairy   |
| Jeff        | 150  | Organic Row Crops; CSA Produce; Diverse Livestock |
| Jessica     | 25   | Diverse Livestock; CSA produce                    |
| Justin      | 100  | CSA Produce                                       |
| Karen       | 150  | Diverse Livestock                                 |
| Luke        | 2    | CSA Produce                                       |
| Marcus      | 100  | Apples; Cider                                     |
| Nicole      | 100  | CSA Produce; Baking Goods                         |
| Paul        | 75   | Cattle  |
| Phil        | 30   | Diversified Livestock                             |

|        |      |                       |
|--------|------|-----------------------|
| Robin  | 15   | Greens                |
| Sandra | 4    | CSA Produce;<br>Cider |
| Sarah  | 75   | Livestock             |
| Zack   | 1500 | Dairy                 |

## Works Cited

- Abrams, S. J., & Fiorina, M. P. (2012). "The big sort" that wasn't: A skeptical reexamination. *PS: Political Science & Politics*, 45(2), 203-210.
- AgDaily. 2020. "Video: Did Bloomberg Belittle the Knowledge and Expertise of Farmers?"  
AGDAILY. Retrieved November 30, 2021  
(<https://www.agdaily.com/video/bloomberg-belittles-knowledge-expertise-american-farmers/>).
- Allen, John. & Kevin Bernhardt. (1995). "Farming Practices and Adherence to an Alternative Agriculture Paradigm. *Rural Sociology*. 60(2):297-309.
- Allen, P. (2008). Mining for justice in the food system: Perceptions, practices, and possibilities. *Agriculture and Human Values*, 25(2), 157-161.
- Allen, P. (2010). Realizing justice in local food systems. *Cambridge Journal of Regions, Economy and Society*, 3(2), 295-308.
- Allen, P., FitzSimmons, M., Goodman, M., & Warner, K. (2003). Shifting plates in the agrifood landscape: the tectonics of alternative agrifood initiatives in California. *Journal of rural studies*, 19(1), 61-75.
- American Medical Association. (2012). H-480.958 Bioengineered (Genetically Engineered) Crops and Foods. 2015-12-09]. American Medical Association. <https://www.ama-assn.org/ssl3/ecomm/PolicyFinderForm.pl>.
- Antonio, R. J., & Brulle, R. J. (2011). The unbearable lightness of politics: Climate change denial and political polarization. *The Sociological Quarterly*, 52(2), 195-202.
- Baldassarri, D., & Bearman, P. (2007). Dynamics of political polarization. *American*



- Sociological Review, 72(5), 784-811.
- Baldassarri, D., & Gelman, A. (2008). Partisans without constraint: Political polarization and trends in American public opinion. *American Journal of Sociology*, 114(2), 408-446.
- Beck, U. (1992). From industrial society to the risk society: questions of survival, social structure and ecological enlightenment. *Theory, culture & society*, 9(1), 97-123.
- Bell, M. M. (2004). *Farming for us all: Practical agriculture and the cultivation of sustainability*. Penn State press.
- Bell, S. E., & York, R. (2010). Community economic identity: The coal industry and ideology construction in West Virginia. *Rural Sociology*, 75(1), 111-143.
- Bell, S. E., Hullinger, A., & Brislen, L. (2015). Manipulated Masculinities: Agribusiness, Deskilling, and the Rise of the Businessman-Farmer in the United States. *Rural Sociology*, 80(3), 285-313.
- Berry, W. (1977). *The Unsettling of America*. Sierra Club Books. San Francisco.
- Beus, C. E., & Dunlap, R. E. (1990). Conventional versus alternative agriculture: The paradigmatic roots of the debate. *Rural sociology*, 55(4), 590-616.
- Bonanno, A., Busch, L., Friedland, W., Gouveia, L., & Mingione, E. (1994). *From Columbus to ConAgra: the globalization of agriculture and food*. University Press of Kansas.
- Bonanno, A. (2009). Sociology of agriculture and food beginning and maturity: the contribution of the Missouri School (1976-1994). *Southern Rural Sociology*, 24(2).
- Boutyline, A., & Vaisey, S. (2017). Belief network analysis: A relational approach to understanding the structure of attitudes. *American journal of sociology*, 122(5), 1371-1447.
- Boykoff, M. T., & Boykoff, J. M. (2007). Climate change and journalistic norms: A case-study

- of US mass-media coverage. *Geoforum*, 38(6), 1190-1204.
- Brubaker, R. (2017). Why populism?. *Theory and society*, 46(5), 357-385.
- Brulle, R. J. (2014). Institutionalizing delay: foundation funding and the creation of US climate change counter-movement organizations. *Climatic change*, 122(4), 681-694.
- Brulle, R. J., & Jenkins, J. C. (2006). Spinning our way to sustainability?. *Organization & Environment*, 19(1), 82-87.
- Brulle, R. J. (2018). The climate lobby: a sectoral analysis of lobbying spending on climate change in the USA, 2000 to 2016. *Climatic change*, 149(3-4), 289-303.
- Brulle, R. J., Carmichael, J., & Jenkins, J. C. (2012). Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. *Climatic change*, 114(2), 169-188.
- Buck, D., Getz, C., & Guthman, J. (1997). From farm to table: The organic vegetable commodity chain of Northern California. *Sociologia ruralis*, 37(1), 3-20.
- Busch, L., Lacy, W. B., Burkhardt, J., & Lacy, L. R. (1991). *Plants, power and profit: social, economic and ethical consequences of the new biotechnologies*. Blackwells.
- Busch, L., & Juska, A. (1997). Beyond political economy: actor networks and the globalization of agriculture. *Review of International Political Economy*, 4(4), 688-708.
- Busch, L. (2000). The moral economy of grades and standards. *Journal of Rural Studies*, 16(3), 273-283.
- Busch, L., & Bain, C. (2004). New! Improved? The transformation of the global agrifood system. *Rural sociology*, 69(3), 321-346.
- Buttel, F. H., & Belsky, J. (1987). Biotechnology, plant breeding, and intellectual property:

- Social and ethical dimensions. *Science, Technology, & Human Values*, 12(1), 31-49.
- Buttel, F. H. (2000). The recombinant BGH controversy in the United States: Toward a new consumption politics of food?. *Agriculture and Human Values*, 17(1), 5-20.
- Callon, M. (1984). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. *The sociological review*, 32(1\_suppl), 196-233.
- Carfagna, L. B., Dubois, E. A., Fitzmaurice, C., Ouimette, M. Y., Schor, J. B., Willis, M., & Laidley, T. (2014). An emerging eco-habitus: The reconfiguration of high cultural capital practices among ethical consumers. *Journal of Consumer Culture*, 14(2), 158-178.
- Carmichael, J. T., Brulle, R. J., & Huxster, J. K. (2017). The great divide: Understanding the role of media and other drivers of the partisan divide in public concern over climate change in the USA, 2001–2014. *Climatic change*, 141(4), 599-612.
- Carmichael, J. T., & Brulle, R. J. (2017). Elite cues, media coverage, and public concern: an integrated path analysis of public opinion on climate change, 2001–2013. *Environmental Politics*, 26(2), 232-252.
- Carolan, Michael. 2006. "Social Change and the Adoption and Adaption of Knowledge Claims: Whose truth do you trust in regard to Sustainable Agriculture?" *Agriculture and Human Values*. 23:325-339
- Clancy, K. A., & Clancy, B. (2016). Growing monstrous organisms: the construction of anti-GMO visual rhetoric through digital media. *Critical Studies in Media Communication*, 33(3), 279-292.
- Clark, B., & York, R. (2008). Rifts and shifts. *Monthly Review*, 60(6), 13-24.

- Collins HM, Evans R and Weinel M (2017) STS as science or politics? *Social Studies of Science* 47(4): 580–586.
- Conforti, P. (2011). Looking ahead in world food and agriculture: perspectives to 2050. Food and Agriculture Organization of the United Nations (FAO).
- Cowan, Sarah, & Baldassarri, D. (2018). “It Could Turn Ugly’: Selective Disclosure of Attitudes in Political Discussion Networks.” *Social Networks* 52:1–17.  
<https://doi.org/10.1016/j.socnet.2017.04.002>.
- DellaPosta, D. (2020). Pluralistic collapse: The “oil spill” model of mass opinion polarization. *American Sociological Review*, 85(3), 507-536.
- DuPuis, E. M. (2000). Not in my body: BGH and the rise of organic milk. *Agriculture and human values*, 17(3), 285-295.
- DuPuis, E. M. (2002). *Nature's perfect food: How milk became America's drink*. NYU Press.
- DuPuis, E. M., & Gillon, S. (2009). Alternative modes of governance: organic as civic engagement. *Agriculture and human values*, 26(1-2), 43-56.
- DuPuis, E. M., & Geisler, C. (1988). Biotechnology and the Small Farm: What Can Green-Revolution Studies Tell Us about the Social Impacts of Bovine Growth Hormone?. *BioScience*, 38(6), 406-411.
- Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2012). Climate on cable: The nature and impact of global warming coverage on Fox News, CNN, and MSNBC. *The International Journal of Press/Politics*, 17(1), 3-31.
- Friedland, W. H., Barton, A. E., & Thomas, R. J. (1981). Manufacturing green gold. *Cambridge Books*.
- Friedland, W. H. (1982). The end of rural society and the future of rural sociology. *Rural*

- Sociology*, 47(4), 589.
- Friedland, W. H. (2002). Agriculture and rurality: beginning the “final separation”?. *Rural sociology*, 67(3), 350-371.
- Friedmann, H. (1993). The political economy of food: a global crisis. *New left review*, (197), 29-57.
- Fuller, S. (2016). Embrace the inner fox: Post-truth as the STS symmetry principle universalized. *Social Epistemology Review and Reply Collective*, 25.
- Goodman, D., & DuPuis, E. M. (2002). Knowing food and growing food: beyond the production–consumption debate in the sociology of agriculture. *Sociologia ruralis*, 42(1), 5-22.
- Goodman, D., & Redclift, M. (2002). *Refashioning nature: food, ecology and culture*. Routledge.
- Goodman, D. (2004). Rural Europe redux? Reflections on alternative agro-food networks and paradigm change. *Sociologia ruralis*, 44(1), 3-16.
- Goodman, D. (1999). Agro-food studies in the ‘age of ecology’: nature, corporeality, biopolitics. In *The Rural* (pp. 127-148). Routledge.
- Guthman, J. (2014). *Agrarian dreams: The paradox of organic farming in California* (Vol. 11). Univ of California Press.
- Guthman, J., Morris, A. W., & Allen, P. (2006). Squaring farm security and food security in two types of alternative food institutions. *Rural sociology*, 71(4), 662-684
- Guthman, J., & DuPuis, M. (2006). Embodying neoliberalism: economy, culture, and the politics of fat. *Environment and planning D: Society and Space*, 24(3), 427-448.
- Guthman, J. (2008). Bringing good food to others: Investigating the subjects of alternative

- food practice. *Cultural geographies*, 15(4), 431-447.
- Hamilton, L., 2011. Education, politics, and opinions about climate change: evidence for interaction effects. *Climatic Change*. 104, 231-242.
- Hamilton, L., Colocousis, C., Duncan, C., 2010. Place effects on environmental views. *Rural Sociol.* 75 (2), 326-347.
- Hamilton, L., Keim, B., 2009. Regional variation in perceptions about climate change. *Int. J. Climatol.* 29, 2348-2352.
- Harding, S. (2016). 6. "Strong Objectivity" and Socially Situated Knowledge. In *Whose science? Whose knowledge?* (pp. 138-163). Cornell University Press.
- Hassanein, N., & Kloppenburg Jr, J. R. (1995). Where the Grass Grows Again: Knowledge Exchange in the Sustainable Agriculture Movement 1. *Rural Sociology*, 60(4), 721-740.
- Hendrickson, M. K., & Heffernan, W. D. (2002). Opening spaces through relocalization: locating potential resistance in the weaknesses of the global food system. *Sociologia ruralis*, 42(4), 347-369.
- Hess, D. J. (2007). *Alternative pathways in science and industry*. MIT Press.
- Hess, D. J., Mai, Q. D., & Brown, K. P. (2016). Red states, green laws: ideology and renewable energy legislation in the United States. *Energy Research & Social Science*, 11, 19-28.
- Hess, D. J., & Brown, K. P. (2017). Green tea: clean-energy conservatism as a countermovement. *Environmental Sociology*, 3(1), 64-75.
- Hetherington, M. J. (2001). Resurgent mass partisanship: The role of elite polarization. *American Political Science Review*, 95(3), 619-631.
- Hill, S. J., & Tausanovitch, C. (2015). A disconnect in representation? Comparison of trends

- in congressional and public polarization. *The Journal of Politics*, 77(4), 1058-1075.
- Hochschild, A. R. (2018). *Strangers in their own land: Anger and mourning on the American right*. The New Press.
- IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. (2015). Some organophosphate insecticides and herbicides. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans*. Vol 112.
- Intergovernmental Panel on Climate Change (IPCC). (2014). Fifth assessment report. Geneva, Switzerland: IPCC.
- Kazin, M. (2016). Trump and American populism: Old wine, new bottles. *Foreign Aff.*, 95, 17.
- Kinchy, A. J., & Kleinman, D. L. (2003). Organizing credibility: Discursive and organizational orthodoxy on the borders of ecology and politics. *Social Studies of Science*, 33(6), 869-896.
- Kinchy, A. J., Kleinman, D. L., & Autry, R. (2008). Against free markets, against science? Regulating the socio-economic effects of biotechnology. *Rural Sociology*, 73(2), 147-179.
- Kinchy, A. J. (2010). Anti-genetic engineering activism and scientized politics in the case of “contaminated” Mexican maize. *Agriculture and Human Values*, 27(4), 505-517.
- Kinchy, A. (2010). Epistemic boomerang: Expert policy advice as leverage in the campaign against transgenic maize in Mexico. *Mobilization: An International Quarterly*, 15(2), 179-198.
- Kinchy, Abby. 2012. *Seeds, science, and struggle: The global politics of transgenic crops*. MIT Press, Boston.
- Kloppenburg Jr, J. (1991). Social theory and the de/reconstruction of agricultural science:

- local knowledge for an alternative agriculture 1. *Rural sociology*, 56(4), 519-548.
- Kloppenburg Jr, J., Lezberg, S., De Master, K., & Stevenson, G. W. (2000). Tasting Food, Tasting Sustainability: Defining the Attributes of an Alternative Food System with Competent, Ordinary People. *Human organization*, 59(2).
- Kloppenburg, J. (2010). Impeding dispossession, enabling repossession: biological open source and the recovery of seed sovereignty. *Journal of agrarian change*, 10(3), 367-388.
- Knorr-Cetina, K. (1999). *Epistemic cultures: How the sciences make knowledge*. Harvard University Press.
- Lacy, W. B. (2000). Empowering communities through public work, science, and local food systems: Revisiting democracy and globalization. *Rural sociology*, 65(1), 3-26.
- Leap, B. T. (2019). *Gone Goose: The Remaking of an American Town in the Age of Climate Change*. Social Forces.
- Leiserowitz, A. A. (2005). American risk perceptions: Is climate change dangerous?. *Risk Analysis: An International Journal*, 25(6), 1433-1442.
- Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic change*, 77(1-2), 45-72.
- Leiserowitz, A. A., Maibach, E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013). Climategate, public opinion, and the loss of trust. *American behavioral scientist*, 57(6), 818-837.
- Lockie, S. (2017). Post-truth politics and the social sciences. *Environmental Sociology*, 3(1), 1-5.



- Lynch, Michael. 2020. "We Have Never Been Anti-Science: Reflections on Science Wars and Post-Truth." *Engaging Science, Technology, and Society* 6(0):49–57.
- Marisa Dispensa, J., & Brulle, R. J. (2003). Media's social construction of environmental issues: focus on global warming—a comparative study. *International Journal of sociology and social policy*, 23(10), 74-105.
- Marsden, T. (2012). Third Natures? Reconstituting Space through Place-making Strategies for Sustainability. *International Journal of Sociology of Agriculture & Food*, 19(2).
- McCright, A. M. (2010). The effects of gender on climate change knowledge and concern in the American public. *Population and Environment*, 32(1), 66-87.
- McCright, A. M., & Dunlap, R. E. (2000). Challenging global warming as a social problem: An analysis of the conservative movement's counter-claims. *Social problems*, 47(4), 499-522.
- McCright, A. M., & Dunlap, R. E. (2003). Defeating Kyoto: The conservative movement's impact on US climate change policy. *Social problems*, 50(3), 348-373.
- McCright, A. M., & Dunlap, R. E. (2010). Anti-reflexivity. *Theory, Culture & Society*, 27(2-3), 100-133.
- McCright, A., Dunlap, R., Maquart-Pyatt, S., (2016). Political ideology and views about climate change in the European Union. *Environ. Polit.* 25 (2), 338-358.
- McCright, A., Dunlap, R., 2011a. Cool dudes: the denial of climate change among conservative white males in the United States. *Global Environ. Change* 21, 1163-1172.
- McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The*

- Sociological Quarterly*, 52(2), 155-194.
- Merton, R. K. (1968). The Matthew Effect in Science: The reward and communication systems of science are considered. *Science*, 159(3810), 56-63.
- Meyer, R. (2018). They're Here to Fix Climate Change! They're College Republicans. *The Atlantic*. Retrieved from <https://www.theatlantic.com/science/archive/2018/02/college-republicans-carbon-climate-change-plan/554465/>
- Michigan State University. 2019. "MSU Extension Tackles Farm Stress." *MSUToday*. Retrieved January 31, 2020 (<http://msutoday.msu.edu/news/2019/msu-extension-tackles-farm-stress/>).
- Moffitt, B., & Tormey, S. (2014). Rethinking populism: Politics, mediatisation and political style. *Political studies*, 62(2), 381-397.
- Mudde, C., & Kaltwasser, C. R. (2017). *Populism: A very short introduction*. Oxford University Press.
- National Academies of Sciences, Engineering, and Medicine. (2016). *Genetically engineered crops: experiences and prospects*. National Academies Press.
- Norgaard, K. M. (2011). *Living in denial: Climate change, emotions, and everyday life*. MIT Press.
- Nugent, W. (2009). *Progressivism: A very short introduction*. Oxford University Press.
- Panizza, F. (2005). *Introduction: Populism and the mirror of democracy*.
- Rahmstorf, Stefan. 2004. "The Climate Sceptics." *Weather Catastrophes and Climate Change*.
- Schurman, R. (2004). Fighting "Frankenfoods": Industry opportunity structures and the efficacy of the anti-biotech movement in Western Europe. *Social problems*, 51(2),

243-268.

- Schurman, R., & Munro, W. A. (2013). *Fighting for the Future of Food: Activists versus Agribusiness in the Struggle over Biotechnology* (Vol. 35). U of Minnesota Press.
- Smith, L. G., Kirk, G. J., Jones, P. J., & Williams, A. G. (2019). The greenhouse gas impacts of converting food production in England and Wales to organic methods. *Nature communications*, 10(1), 1-10.s
- Tilman, D., Fargione, J., Wolff, B., D'antonio, C., Dobson, A., Howarth, R., & Swackhamer, D. (2001). Forecasting agriculturally driven global environmental change. *science*, 292(5515), 281-284.
- USDA. (2017). *USDA's National Agricultural Statistics Service: Ag Census*. USDA, NASS, Washington, DC.
- US EPA. (2019). *Inventory of US greenhouse gas emissions and sinks: 1990–2017*.
- van der Linden, S., Leiserowitz, A., & Maibach, E. (2019). The gateway belief model: A large-scale replication. *Journal of Environmental Psychology*, 62, 49-58.
- Wuthnow, R. (2010). *Remaking the heartland: Middle America since the 1950s*. Princeton University Press.
- Wuthnow, R. (2015). *In the blood: Understanding America's farm families*. Princeton University Press.
- Wuthnow, R. (2019). *The Left Behind: Decline and Rage in Small-Town America*. Princeton University Press.
- Wynne, B. (1992). Misunderstood misunderstanding: social identities and public uptake of science. *Public understanding of science*, 1(3), 281-304.
- Wynne, B. (2005). Risk as globalizing' democratic' discourse? Framing subjects and citizens

pp. 66–82 in Melissa Leach, Ian Scoones & Brian Wynne (eds.) *Science and Citizens*.