

THE STORY OF SOY: A COMPARATIVE ANALYSIS OF WOMEN IN  
AGRICULTURE IN INDIA AND THE UNITED STATES USING THE WORLD'S  
MOST PROLIFIC OILSEED

BY

JORDAN STEPHANIE GREENSTEIN

A thesis submitted to the

Graduate School-New Brunswick

Rutgers, The State University of New Jersey

in partial fulfillment of the requirements

for the degree of

Master of Arts

Graduate Program in Women's and Gender Studies

written under the direction of

Dr. Zakia Salime

and approved by

---

---

---

New Brunswick, New Jersey

*May 2013*

## ABSTRACT OF THE THESIS

The Story of Soy: A Comparative Analysis of Women in Agriculture in India and the United States Using the World's Most Prolific Oilseed

by JORDAN STEPHANIE GREENSTEIN

Thesis Director:

Dr. Zakia Salime

The following chapters use soy as a lens through which to analyze the current status of agricultural systems in the United States and India and the subsequent effects on women in the field. The fact that this foreign crop (in both countries) has become a principle component in international agriculture and trade highlights the ways in which food processes throughout the world have shifted. It also demonstrates women's changing responsibilities. Notably, India's shift in focus to agricultural industrial processing, exportation, and casual labor has undermined women's more traditional roles as cultivators. Combined with alarming nutrition and hunger statistics for women in the regions that grow the most soy, the consequences of the crop's cultivation in India go far beyond economics. In the United States, the effects of soy are not as easily investigated. Soy serves as more of a representation of what industrialized agriculture can become and the unique part the United States plays in international food production. Women's roles in crop cultivation differ in the United States and in India. As such, the consequences of soy will inevitably develop in different ways.

## Table of Contents

|   |            |
|---|------------|
| <b>Chapter 1: Introduction</b>  | <b>1</b>   |
| <b>Chapter 2: The Story of Soy in the U.S. and India: How a Foreign Crop Came to Dominate the Countries' Agricultural Systems</b>   | <b>17</b>  |
| <b>Chapter 3: “The Invisible Farmer”:</b> The Forgotten Role of Women in United States Agriculture                                  | <b>27</b>  |
| <b>Chapter 4: “The Face of the Farmer in India is Female”</b>   | <b>46</b>  |
| <b>Chapter 5: From the Farm to the Table, Or At Least to the Elevators: The State of Agriculture in India and the United States</b> | <b>69</b>  |
| <b>Chapter 6: Conclusion</b>  | <b>99</b>  |
| <b>Bibliography</b>   | <b>103</b> |

## Table of Figures

|  |    |
|--|----|
| Figure 1. Picture from Dodge Ram “Farmer” Commercial                         | 28 |
| Figure 2. “American Gothic” by Grant Wood                                    | 29 |
| Figure 3. Female Principal Operators in United States                        | 31 |
| Figure 4. Government aid distributed to U.S. Farms                           | 32 |
| Figure 5. Number of Farms Operated by Women in United States                 | 35 |
| Figure 6. Female Workers in U.S. Agriculture                                 | 40 |
| Figure 7. Agricultural Laborers in the United States                         | 41 |
| Figure 8. Seed Bank at Navdanya Farm   | 46 |
| Figure 9. Division of Labor for Women Rural Workers in India                 | 54 |
| Figure 10. Women Agricultural Workers in India by Status                     | 54 |
| Figure 11. Division of Labor for Rural Female Workers in Madhya Pradesh      | 55 |
| Figure 12. Operational Holdings Belonging to Women in India                  | 58 |
| Figure 13. Female Operational Holdings in Madhya Pradesh, 1 to 10 ha., total | 59 |
| Figure 14. Female Operational Holdings in Madhya Pradesh, 20 ha. or greater  | 59 |
| Figure 15. Agricultural Population India 1960                                | 70 |
| Figure 16. Agricultural Population India 2001                                | 70 |
| Figure 17. Average Size of Operational Holdings in India from 1970 to 2006   | 71 |
| Figure 18. Individually Run Operational Holdings 1 to 7.5 ha. in India       | 72 |
| Figure 19. Individually Run Operational Holdings 7.5 ha. or more in India    | 72 |
| Figure 20. Estimated Market Value of Land and Buildings Per Farm U.S.        | 80 |
| Figure 21. Estimated Market Value of Farm Machines and Equipment U.S.        | 80 |
| Figure 22. Market Value of Agricultural Products Sold U.S. 1978 to 2007      | 80 |

|  |    |
|--|----|
| Figure 23. Total Farm Production Expenses United States 1987 to 2007 | 81 |
| Figure 24. Soy Production in India 1986 to 2013                      | 96 |

## 1. Introduction

Agricultural systems throughout the world have been shifting from small-scale to market-driven economic sectors. Most recently, the upsurge in the food commodities exchange has drastically affected the way farming is treated globally. This has had differing and far-reaching effects. Market-based agriculture necessarily features monocultures and cash crops, which besides harmful environmental effects, often undermines traditional agricultural systems and, consequently, women. This is not to say all women are particularly impacted, or that these effects are the same throughout the world. In fact, a generalized analysis of how changing agriculture has affected all women globally would be almost impossible to complete. However, a soy case study in the United States and India can create a platform from which to examine industrialized agriculture's effects on women.

The following chapters use soy as a lens through which to analyze the current status of agricultural systems in the United States and India and the subsequent effects on women in the field. The fact that this foreign crop (in both countries) has become a principle component in international agriculture and trade highlights the ways in which food processes throughout the world have shifted. It also demonstrates women's changing responsibilities. Notably, India's shift in focus to agricultural industrial processing, exportation, and casual labor has undermined women's more traditional roles as cultivators. Combined with alarming nutrition and hunger statistics for women in the regions that grow the most soy, the consequences of the crop's cultivation in India go far beyond economics. In the United States, the effects of soy are not as easily investigated.

Soy serves as more of a representation of what industrialized agriculture can become and the unique part the United States plays in international food production. Women's roles in crop cultivation differ in the United States and in India. As such, the consequences of soy will inevitably develop in different ways.

### **Why Soy?**

Dr. Vandana Shiva's *Stolen Harvest* introduced the topic of soy, which necessitated further research. The cover features soybeans with barcodes imprinted on them, and her chapter, "Soy Imperialism," tells the story of the United States' soy invasion of Indian agriculture. This introduced the idea of agricultural imperialism, and soy became the perfect case study through which to investigate the effects of foreign crops in farming systems. Through research, some of Dr. Shiva's claims have been verified and others discredited. The story of soy in India is much longer than she explains and serves as more than just an example of agricultural imperialism (it was introduced by the United States government). The ramifications go past the 1995 Agreement on Agriculture and into 2013 and beyond, facing a changing economic, political, and agricultural landscape.

This led to the inclusion of the United States. After researching the relationship between the U.S. and India in the soy trade, it seemed almost negligent to discount the country that had so much control over the industry. The government's subsidizations set the world price for soy; the price floors the USDA has set affect farmers in the U.S. and abroad; and Chicago's futures market dictates the sales. The United States plays a major part in the market through its dominance in the World Trade Organization (WTO), its

role in price control, and its introduction of soy to the world's agricultural systems. Although soy originated in China, the U.S. has arguably played the biggest part in making soy the dominant plant in world trade it is today and is also the crop's major producer. This work explores this function, and in doing so, provides a comparison to the effect on women in agriculture in India. By exploring the roles women have played, and currently play, particularly in the regions that grow soy, this work provides a thorough analysis of both the U.S. and India.

### **Approaching women in agriculture.**

This work was initially supposed to explore trade relationships. It was intended to confront the imperialistic aspects of a foreign crop in India taking over its agricultural production systems, and the ways in which that same foreign crop indicated changes in the United States as well. However, on February 3, 2013, Dodge Ram aired a commercial dedicated to its "Year of the Farmer" during the Superbowl, which unabashedly highlighted the male domination of farming in the United States. While it will be discussed in greater detail in Chapter 3, the commercial told the story through a slideshow of the "American farmer" who was, almost without fail, a white male.

It is generally accepted that the farmer in India has traditionally been considered female while the farmer in the United States has historically been considered male. However, seeing it portrayed so glaringly in Dodge's commercial to unquestionable acclaim from farm organizations begged for further questioning. The praise even came from American Agri-Women, which had a page-long thank you note to Dodge on its homepage for weeks following the airing, thanking the company for its recognition of

farmers' hard work. This thesis aims to investigate the truth behind the idea that the farmer in the United States is male and uses that as a point of comparison for food producers in India.

Consequently, this work explores the history of women in U.S. agriculture to see if there is a historical basis to the gender-specific portrayals of American farming. There was a small phase in the mid-1980s to 1990s investigating women in U.S. agriculture. Carolyn A. Sachs began the trend with *The Invisible Farmers: Women in Agricultural Production* published in 1983. She uncovers the women who engage in farm labor daily but are continuously discounted as integral members of the agricultural system in America. She engages with rural women on a personal level to examine how they feel and the barriers to their success. This work uses her second book, *Gendered Fields*, a more recent expansion on women in agriculture throughout the world. Written thirteen years later, she highlights recent changes in the U.S., including the “capitalization of agriculture” and pursues an all-encompassing analysis keeping in mind the “global economic restructuring” occurring throughout the world.<sup>1</sup> She reviews the existing literature attempting to explain why men gained control of crop production when it switched from horticulture to agriculture.<sup>2</sup> She also breaks down traditional gender associations with specific crops, claiming that these are based on their management rather than those involved with the labor.<sup>3</sup>

This applies directly to the study of soy, associated with men in both the United States and India. As Sachs explains, “Men’s crops are more likely to be of the following

---

<sup>1</sup> Carolyn E. Sachs, *Gendered Fields: Rural Women, Agriculture, and Environment* (Boulder: Westview Press, 1996), 4.

<sup>2</sup> Sachs, *Gendered Fields*, 67.

<sup>3</sup> Sachs, *Gendered Fields*, 68.

types: grain or tree; nonfood; raised for market; and raised for export. Women's crops are typically of this sort: vegetables or root; food; raised for subsistence; or raised for local consumption."<sup>4</sup> This, of course, applies to the associations, rather than who actually works with the crops. Sachs goes further to point out, "often women provide substantial labor in men's crops."<sup>5</sup> However, because the men are officially operators of the farms that grow cash crops and manage their distribution, they are typically associated with those crops.

Rachel A. Rosenfeld, one of the pioneers of women in agriculture studies, followed Sachs's first publication with her own groundbreaking work, *Farm Women: Work, Farm, and Family in the United States*. She is referenced in almost every article or book published after 1985 commenting on the subject. She takes Sachs's argument further by questioning why women's labor on farm is discounted to such an extraordinary degree. She points to the domestic ideology of the post-industrial global north where work and home were two separate entities. Meanwhile, women's labor on family farms integrated work and home in ways that social scientists could not handle. She grapples with the concepts that many feminist economists and sociologists had been trying to sort out for years, and points to these ideas as the foundation for women's undervaluation in the field of agricultural labor. She highlights the general ignorance of women's unpaid labor, the typical form their work takes on family farms. She and Sachs both take on the concept of women engaging simultaneously in productive and reproductive work. In both cases, however, Rosenfeld and Sachs emphasize that in order to study women's

---

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

work on farms, scholars must use an entirely different definition of work—particularly new for the time in which both women began examining the subject.

Several authors trace the exclusion of women from popular notions of United States agriculture, but Sachs and Rosenfeld represent the foundation of such questions. Unfortunately, it seems that the study of women in American agriculture mostly fell by the wayside into the twenty-first century. Much of what this work uses are new theorizations utilizing data collected by government agencies. However, Sachs and Rosenfeld provide a foundation for any feminist scholar studying rural sociology in the United States. In the early 1980s, Sachs began noting the mass urban migration that would result from global restructuring, the consequent inability for rural citizens to feed themselves by a shift to a market economy, and lack of leadership of women in important farm organizations.<sup>6</sup> All of these predictions came true.

Today, there is one woman on the board of directors of the American Soybean Association (ASA), the ultra-powerful soy lobbying group in Washington D.C. There is one woman in the executive committee of the United Soybean Board (USB), ASA's marketing and research counterpart, which, for legal reasons, cannot lobby. Proving Sachs's point further, there are no women in the executive committee of the Iowa Soybean Association, the state that produces the most soy in America. Following the long history of associating men alone with cash crop production, women still do not hold leadership positions in the powerful farm organizations of the United States. Even today, most women's agricultural movements are engaged in support of small-scale, organic agriculture, the relevance of which is a focus in the third chapter.

---

<sup>6</sup> Sachs, *Gendered Fields*, 178, 147, 136.

Unlike with the United States, there is a wealth of current literature examining women in agriculture in India. Most notably *Women in Agriculture*, volume 25 in *A Millennium Study on The State of the Indian Farmer*, written by Maithreyi Krishnaraj and Amita Shah and commissioned by India's Department of Agriculture and Cooperation, provides a thorough analysis. Despite the fact that the Indian government sponsored the work, the authors provide comprehensive, and even critical, information on women in Indian agriculture. M. Krishnaraj also wrote "Food Security, Agrarian Crisis and Rural Livelihoods: Implications for Women," published in *Economic and Political Weekly*, which has also been useful. Two chapters from *WTO, Globalization, and Indian Agriculture* also provide detailed information. K. Harathi and B. Deepthi Nanada's "Women Participation in Indian Agriculture," and P. Kumari, K. Mercy, Mahendra Kumar, and B.S. Rao's "Globalization and the Changing role of Women in Agriculture" both give current analyses of women in agriculture and the effects of globalization.

All of the literature reviewing women in agriculture in India has led to the same conclusion and reaffirms the earlier sentiment that the United States supposedly contrasts. Agricultural production in India has evolved through generations of women's seed collection and traditional knowledge to establish food security and nutritious local cuisines. Indian women in agriculture possess specialized knowledge, which can only be gained through experience and generations of learning. Many authors have also made note of the change in the oilseed sector and its effects on women. Bagchi's article, written thirty years ago, comments on the change yet to come, and several other authors included in *The State of the Indian Farmer* series talk about the changes in oilseed production throughout India.

A significant reason for choosing soy was its role in changing India's oilseed production, a field formerly dominated by women. While soy cannot be fully blamed for the negative effects women in agriculture have experienced such as job losses, creation of new unstable employment, devaluation of contributions to food production, change in diet, lack of food security, increased male urban migration, and the undermining of small-scale and subsistence based agriculture, it can be considered as a contributing factor. It also provides a narrower lens through which to examine agricultural change in India. Because the shifts in the country have been so sweeping, it would be impossible to review them all in one piece of writing. The Indian government's commission took twenty-seven volumes of books. Soy, therefore, provides a specific means through which to examine agricultural change, and the consequent effects on women, with the added dimensions of its dominance as a foreign cash crop and prominent figure in world trade.

### **Agricultural change?**

Several academics have already documented, in detail, the state of agriculture in India. Many authors have noted the significant shift in agriculture from subsistence to market-based and have almost universally agreed that agriculture in India has changed almost completely over the last fifty years. This has been attributed to many factors ranging from post-colonial industrialization efforts to increased competition in a global food distribution system. However, these agricultural shifts have affected everyone living in India. Food distribution has changed, urban areas are growing, and the labor force has become increasingly heterogeneous. There are so many ways with which to approach the results of India's new food production sector, it is almost impossible to

begin. Examining through the lens of women alone also could not provide a narrow enough means through which to understand. Hence, the introduction of soy to the analysis, which helps to keep the ideas focused to particular regions and food production sectors.

The *State of the Indian Farmer* millennium study's 27 volumes allow a full understanding of agriculture in India. Each comprehensively explains different aspects of Indian agriculture from *Agricultural Exports* (by B. Bhattacharyya) to *Crops and Cultivation* (by R.S. Deshpande, M.J. Bhende, P. Thippaiah, and M. Vivekananda). Additionally, *Glimpses of Indian Agriculture: Macro and Micro Aspects (A Set of Two Volumes)* provides significant resources for anyone hoping to pursue similar research. Several articles have been useful for this particular project including: "Contract Farming in India: Text and Cases," by Gurdev Singh and S.R. Asokan, "Oilseeds and Oil Economy of India," by Vijay Paul Sharma, Saradendu Patnaik, and Hiren Tilala, "Processed Food Marketing in India: Selective Case Studies," by Prakash M. Shinghi and D.S. Parmar, "Food Quality Management in Agro Enterprises," by Satish Y. Deodhar and Vijay Intodia, and "Evaluation of Oilseed Production Program in Karnataka: State Sector and District Sector Schemes" by R.S. Deshpande and K.J. Parameswarappa. They all contribute to various levels of research on agriculture in India, from understanding the oilseed market to investigating the food-processing sector.

Contract farming surprisingly plays a major role in India, and already dominates United States agriculture. In their analysis of four contract-farming case studies, Gurdev Singh and S.R. Asokan illuminate some of the benefits and consequences of such a practice in their chapter of *Glimpses of Indian Agriculture*. They varied among crops,

and the authors did not include soy in a case study. In many situations, there was a high net return with assured payment. Additionally, those with short-term crop contracts had relatively flexible obligations and could easily leave once the season ended. Those with long-term contracts, however, had to invest significantly and would face harsh punishments if they found more money elsewhere.<sup>7</sup> In some cases, the contracts were written in English or were lengthy and had confusing clauses. In all cases, the companies retained copies of these contracts, whereas the farmers never did.<sup>8</sup>

Because soy was not included, and in most cases, contract farming is not made part of official public surveys, the effect on the soy industry could not be fully analyzed. Singh had referenced contract farming as a means for processors to procure soy in his historical overview. Nevertheless, in a sample of some large soy processing companies located in Madhya Pradesh, none publicly released where or how they procured the soy originally. However, through research on the case study in the last chapter, Cargill, and general farming systems in the United States, it was revealed how big of a role contract farming was beginning to play in the soy industry and in international agriculture as a whole. Contract farming is the new, efficient way for firms to procure their materials to distribute globally, and Cargill serves as one of many examples of how this system is growing in soy, particularly in India.

---

<sup>7</sup> Gurdev Singh and S.R. Asokan, "Contract Farming in India: Text and Cases," in *Glimpses of Indian Agriculture: Macro and Micro Aspects*, ed. S.M. Jharwal et al. (New Delhi: Academic Foundation in Association with Directorate of Economics and Statistics, Dept. of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India and Agricultural Development and Rural Transformation Centre, Institute of Social and Economic Change, 2008), 2:146.

<sup>8</sup> Singh and Asokan, "Contract Farming in India," 2:147.

Unlike in India, there is a wealth of literature on contract farming in the United States, and a growing trend has been to contract outside of the country as well. In 2003, 40 percent of agricultural products in the U.S. were produced under contract, up from 29 percent in 1991 and 12 percent in 1968.<sup>9</sup> The products often have to meet strict (and sometimes unreasonable) guidelines in order to maintain coherency. Additionally, contracts are increasingly going to large-scale producers, as “it is more efficient for processors to have a few contracts with large producers than have many contracts with smaller producers.”<sup>10</sup> Consolidation of production units, of course, comes with greater risk (i.e. if there was a contamination on a farm), but the efficiency that results mitigates the consequences. This also creates horizontal integration—decreasing the number of farms growing a specific crop and increasing the size.<sup>11</sup> Research on agricultural firms based outside of the United States, such as Cargill, also revealed the shocking extent to which they had taken over roles as international farming contractors in countries such as India.

This is not meant to discount the overwhelming effect that contract farming has on United States agriculture. A 2005 article by Mary Clare Ahearn, Penni Korb, and David Banker published in the *Journal of Agricultural and Applied Economics* entitled “Industrialization and Contract in U.S. Agriculture,” provides a useful introduction to the current state of domestic agriculture. Interestingly, they credit agricultural industrialization being pursued through contract farming to the demands being created by

---

<sup>9</sup> Mary Clare Ahearn, Penni Korb, and David Banker, “Industrialization and Contract in U.S. Agriculture,” *Journal of Agricultural and Applied Economics* 37.2 (Aug. 2005): 361.

<sup>10</sup> Peter J. Barry, “Industrialization Of U.S. Agriculture: Policy, Research, And Education Needs,” *Agricultural and Resource Economics Review* 24. April (1995): 131.

<sup>11</sup> *Ibid.*

consumers.<sup>12</sup> Using the vertical integration reached by corporations who control the commodity from its production to its sale, it becomes easier to meet this demand. Peter J. Barry also addresses this idea in his analysis of vertical integration in “Industrialization of U.S. Agriculture: Policy, Research, and Education Needs.” He also extensively examines contract farming as a key aspect of the vertical integration currently dominating United States agriculture, but instead of crediting the creation of demands to consumers, points to the corporations themselves as generating those needs. While contracting may not fit into the traditional definition of vertical integration, it does contribute to the concentration of control of agriculture into fewer hands.

Contract farming contributes to the vertical integration of agriculture in the United States. Corporations are controlling much of the food market, not, as many think, by edging out family farms, but by paying those farms to produce for them. As in India, contracting puts many families at a disadvantage. They often have to use expensive chemicals or follow other stringent requirements to maintain their contracts, and if they choose not to, there are few remaining markets to join. Small farmers often cannot afford the rules set by these corporations, forcing them to take part in less lucrative markets, or to sell or lease their land to larger farms. Hence, as in India, the small farms become smaller and the large farms become larger. Meanwhile, the number of midsized farms has decreased substantially.<sup>13</sup>

---

<sup>12</sup> Ahearn et al., “Industrialization and Contract,” 347.

<sup>13</sup> Ahearn et al., “Industrialization and Contract,” 349.

## Chapters

The following chapters attempt to situate women in agriculture in the United States and India through the context of soy. The field is too large and complex to investigate without a specific lens. By narrowing the examination, soy also adds a new dimension to the analysis. U.S. and Indian agricultural systems have soy in common. For both, it is a foreign crop, and for both, it is grown as a cash crop rather than as a means to feed their own populations. Its production is predicated almost solely upon industrialized and mechanized processes, epitomizing the loss of traditional farming structures in both countries, but in very distinct ways.

This is why the second chapter begins with a historical overview of soy in both countries. Situating soy in the original contexts of American plantation agriculture and Indian subsistence farming establishes the historical differences between both countries in this particular field. It also makes the relationship between them through soy, and most likely through other new agricultural products, very clear. It provides a new means of understanding the complexity of women in India's changing roles and the growing power of Cargill in the country while also narrowing the scope of analysis. A historical overview contextualizes the entire paper. It provides a means through which to begin an examination of women in agriculture based on changes that have occurred and factors that have contributed to the systems' current states.

Chapter three provides an overview of women in United States agriculture, trying to focus specifically on the areas in the sector that deal with soy. When possible, related statistics on Iowa, the nation's largest producer of soy, are included. The chapter confronts popular ideas of women in agriculture in the country, such as the Dodge

commercial, and contrasts them with reality. Through this, the discussion expands to women as farm operators and laborers using government statistics and reports. The section attempts to dispel popular notions of women in U.S. agriculture and introduce new ways of viewing their contributions. It places women working in agriculture in the context of soy to narrow the scope of the investigation and present women's absence in this, and other moneymaking, food industries.

Chapter four uses a similar tactic. Women in India also do not have leading roles in cash crop industries. They are the nurturers, the cultivators, the managers of seeds and small subsistence farms, presumably preventing them from making a meaningful contribution to the profitable industries in the country's agricultural production. Unlike in the United States, women's roles as farmers in India are very much recognized, as are the increasing threats to their important functions. Many movements have been started trying to salvage the roles of women in agriculture, who have maintained food security and sustainable farms for generations. Once again, government statistics are used to review the changing status of women in India as operators and laborers in the face of technological and systematic change.

This change is discussed in Chapter 5, which reviews agriculture in the United States and India, coming together in a discussion of contract farming and Cargill. Once again, where possible, it brings the focus to Iowa and Madhya Pradesh (India's largest producer of soy). However, it also reflects on the similarities and differences between the changes both countries have undergone. Clearly, agriculture is much more different around the world than it was just twenty years ago. However, those differences are unique to location and stage in agricultural industrialization. This phase began in the

United States around World War II, as discussed in Chapter 2. Meanwhile India's major shifts have been more recent, although spurred by post-Independence efforts to become competitive on an international scale.

### **Women and Agriculture in the United States and India: An Investigation Through the Story of Soy.**

The six chapters of this work address several research questions. What were the effects of soy growth in the United States and India? How have women's roles in rural areas have changed? What were women's different roles originally in cultivation in the US and India? What are the perceptions of what they were/are? If the roles have changed, what have been the consequences? What will be the consequences? More specifically, how have employment or farm operation opportunities in the agricultural sector altered? How have women's roles within the family altered as a result of agricultural industrialization? Have there been changes to tradition (religious, familial, cultural) as a result of the soy industry in certain regions of the US and India? Have women been empowered by any of these changes?

These questions serve as a guide to tell the stories of women in agriculture in two such seemingly different countries, which in reality, are actually quite similar. The chapters are meant to reflect on the status of women in agriculture in the United States and India, using the case study of soy and its historical, sociological, and political implications. By providing detailed accounts of soy's history, women's status as farm laborers and operators, and current positions of agricultural systems, the story of soy and what it means for women in agriculture can be pieced together. The changes that the

systems have undergone can be analyzed in addition to the subsequent effects on women and the roles that they historically, and now currently, play in agricultural production in the United States and India.

## **2. The Story of Soy in the U.S. and India: How a Foreign Crop Came to Dominate the Countries' Agricultural Systems**

### **History of Soy in the United States**

Today, the United States acts a leading figure in the production soy. Although it no longer produces the most soy, its companies contract out to the world's leading producers and its subsidies set the global price. Its current domination, however, is surprising. Soy was uncommon in the country for the most part but then grew exponentially (relatively recently) to what it is today. It started to become more commonly used and grown at the beginning of the twentieth century despite the fact that it had been continuously introduced to the agricultural system since 1765.<sup>14</sup> There was a brief period during the Civil War when it was used as a substitute for coffee, but otherwise, soy remained relatively unpopular.<sup>15</sup> Several world events came together one hundred years ago to create an opening for the American soy industry that has since grown to unprecedented levels.

After the Russo-Japanese War, the Japanese exported their surplus soy to Europe, which then crushed it for use in soap and cattle feed.<sup>16</sup> Until that point, the United States had only been using soy as forage for domestic animals and for its ability to produce

---

<sup>14</sup> Sidney W. Mintz, Chee-Beng Tan, and Christine M. Du Bois, "Introduction: the Significance of Soy," in *The World of Soy*, eds. Christine M. Du Bois, Chee-Beng Tan, and Sidney W. Mintz (Urbana: University of Illinois Press, 2008), 4.

<sup>15</sup> *The Cambridge World History of Food*, (Cambridge: Cambridge University Press, 2000), s.v. "Soy," by Thomas Sorosiak, 423.

<sup>16</sup> Christine M. Du Bois, "Social Context and Diet: Changing Soy Production and Consumption in the Untied States," in Du Bois et al., *The World of Soy*, 210.

*rhizobiaceae* bacteria, which enriched soil by breaking down nitrogen.<sup>17</sup> Europe's creativity with Japan's soy surplus spurred U.S. interest in new uses of soy. At the same time, the oil and fats shortage during World War I, combined with the poor quality of soy imports from Manchuria, paved the way for an increase in production. Soon after, a boll weevil infestation of US cotton 1915 solidified soy's expansion.<sup>18</sup> Soy soon grew in place of cotton and rapidly expanded in the US.

When World War I ended, those farmers who had begun to grow soy in response to the elevated demand found themselves with a surplus of soy and a lack of available markets. Congress responded with a series of tariff barriers including the 1922 Fordney-McCumber Act and, later, the 1930 Smoot-Hawley Tariff Act as well as government-guaranteed base prices for soy.<sup>19</sup> This helped to maintain soy's primacy in U.S. agriculture in the years following its sharp increase in production and indicated the start of many government investments in the industry. For example, after the passage of the Smoot-Hawley Tariff Act, made law largely through the lobbying efforts of the American Soybean Association, the Dust Bowl occurred.<sup>20</sup> This increased the need for soy in order to revive the devastated soil in the Southern Great Plains, and government subsidies with large investments in rural infrastructures and agro-industry "buoyed US soybean acreage and productivity".<sup>21</sup> Additionally, during World War II, while production sharply

---

<sup>17</sup> Mintz et al., "Introduction," 4-5; *Cambridge*, 424; Patel, Raj, *Stuffed and Starved*, (New York: Melville House, 2012), Kindle edition, Chapter 7.

<sup>18</sup> Du Bois, "Social Context," 210.

<sup>19</sup> *Cambridge*, "Soy," 424; Patel, *Stuffed and Starved*, Chapter 7.

<sup>20</sup> Du Bois, "Social Context," 213.

<sup>21</sup> Patel, *Stuffed and Starved*, Chapter 7.

increased due to oil export expectations, the government paid twice the pre-war price at \$1.60 per bushel—officiating its precedence in U.S. agriculture.<sup>22</sup>

Soy remains one of the most highly subsidized crops in the U.S. The government has taken drastic measures to maintain its dominance in worldwide agriculture. Fear that the European markets would not want soy supplies after World War II encouraged the PL 480 program, which brought food to countries in the global South, hence, creating new markets. The government also instituted new trade policies. For instance, during the GATT Kennedy Round of 1964-67, the European Union and the U.S. government agreed that the E.U. would produce cereal while the U.S. would dominate the oilseed market, hence creating specialization and eliminating competition.<sup>23</sup>

Even without government intervention, however, soy would have continued to grow in U.S. agriculture. Entrepreneurs pursued investments in soy in the 1920s because of its oil producing capabilities, particularly for manufacturing, but also for use in soaps, paints, varnishes, ink, explosives, as a substitute for rubber, and various other non-food-related items.<sup>24</sup> It would not be until the 1930s, in fact, that soy started to be used in food products as an ingredient in shortening, margarine, salad dressing, and cooking oils.<sup>25</sup> Du Bois, Tan, and Mintz go so far as to suggest in their introduction to *The World of Soy* that soy's slow introduction into food is one of the primary reasons that food manufacturers do not forwardly advertise it as an ingredient—despite its prevalence in nearly three-quarters of American grocery store products.<sup>26</sup>

---

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

<sup>24</sup> Du Bois, "Social Context," 212; *Cambridge*, "Soy," 424.

<sup>25</sup> *Cambridge*, "Soy," 424.

<sup>26</sup> Mintz, et al., "Introduction," 5; Patel, *Stuffed and Starved*, Chapter 7.

During the 1920s, many corn processors (particularly in Illinois) began to convert their factories to soy processing plants as agricultural machinery improved. Christine Du Bois explains that the increased mechanization was a necessary component of soy production. In her chapter of *The World of Soy*, she argues, “The internal combustion engine was a vital factor in opening the land to the mass production of soybeans”.<sup>27</sup> This shift in agricultural production had a dual impact on soy growth in the U.S. Agricultural machinery enabled the growth of soy, and, as a result the use of farm animals became increasingly for meat or milk rather than for their horsepower. Consequently, the demand for soy meal, rich in protein, increased and was met by the production capabilities enabled by advancements in agricultural production and processing.<sup>28</sup>

Today, soy can be found in all facets of American lives: as a preservative for grocery items, as lecithin in chocolate, as biodiesel fuel. The average American consumer would be hard pressed to spend a day without encountering soy in one way or another. Continued government support through numerous farm bills (such as the controversial 1996 Freedom to Farm Bill) and federal relief packages for oilseed growers has maintained United States supremacy in the soybean industry.<sup>29</sup> In many ways, this preeminence continues because the U.S. has created an enormous market out of its own citizens. In other cases, programs such as PL 480, and others supported by USAID, have created a steady demand for soy throughout the world. One of the most elusive examples of this market creation can be found in the history of soy in India.

---

<sup>27</sup> Du Bois, “Social Context,” 212.

<sup>28</sup> Ibid.

<sup>29</sup> Du Bois, “Social Context,” 225.

## History of Soy in India

Soy most likely arrived in India sometime before 1100 AD through trade with China. However, it remained a minor crop with the exception of a few regional pockets near the North. Outside of East Asia, soy had a relatively negligible impact until the 1940s, when the United States (after over one hundred years of breeding) transformed the crop into a highly efficient, and now the most widely used, source of vegetable oil and protein in the world.<sup>30</sup> Despite the crop's prominence, however, its production continues to be concentrated in a few select countries, the top five being the United States, Brazil, Argentina, China, and India, respectively. India's role as the fifth largest producer of soy in the world serves as the focal point of this paper. In the 1968-69 season, the country produced almost no soy.<sup>31</sup> However, for the 2011-12 season, the country produced 12.57 million tons.<sup>32</sup> What contributed to this drastic change? How could a non-native crop become such a major factor in a country's agriculture? For whom and for what purpose is this grown? And most importantly, how does this shift in agriculture affect women in India?

Finding the history of soy became the most exhaustive effort of this project. After months of searching, a short article written by one of the scientists responsible for the

---

<sup>30</sup> *Cambridge*, 424; B. B. Singh, "Success of soybean in India: the early challenges and pioneer

Promoters," *Asian Agri-History* 10 no. 1 (January – March 2006): 45-53, <http://asianagrihistory.org/vol-10/successofsoyabean.pdf>.

<sup>31</sup> United States Department of Agriculture, Foreign Agricultural Service, Production Supply and Distribution Online Database (Soy Production in India, accessed January 3, 2013), <http://www.fas.usda.gov/psdonline/psdQuery.aspx>.

<sup>32</sup> Directorate of Economics and Statistics: Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, *Agricultural Statistics At a Glance 2011*, (New Delhi: Directorate of Economics and Statistics, 2011), Table 4.19(a), [http://eands.dacnet.nic.in/latest\\_20011.htm](http://eands.dacnet.nic.in/latest_20011.htm).

institution of soy in India, Dr. BB Singh, provided the long sought-after review. His article, “Success of Soybean in India: The Early Challenges and Pioneer Promoters,” together with a few other (and less reliable) sources have led to the conclusion that soy’s popularity in India can be most appropriately studied as the product of a long and enduring effort by public and private industry. Spurred by food shortages and accomplished through international, domestic, and private-industry investment, soy finally became an integral part of the country’s agriculture in the late twentieth century.

Mahatma Gandhi himself tried to introduce the crop as early as 1935. His efforts (and others’) would not take hold until later for various reasons. There was an overwhelming lack of knowledge about soy’s cultivation and uses. Additionally, high yielding varieties had not yet been created, and consumers complained of long cooking time and “beany” flavor.<sup>33</sup> However, post-Independence food shortages and rampant malnutrition due to lack of protein led to a joint collaboration by the GB Pant University of Agriculture and Technology (Pantnagar), the Jawaharlal Nehru Krishi Vishwa Vidyalaya (Jabalpur), and the University of Illinois to experiment with high-yielding soy varieties from the United States. This was part of a larger project of agricultural experimentation during the 1960s led by the Government of India and the United States Agency for International Development (USAID). The movement established twenty-three agricultural universities (Pantnagar and Jabalpur included) meant to work jointly with select U.S. universities in order to confront India’s mounting “food crisis”.

After an initial failure with a soybean strain from Mississippi, the United States Department of Agriculture donated its world collection of soybean germplasm lines

---

<sup>33</sup> Singh, “Success of Soybean,” 46.

(3500) to Pantnagar in 1970. The university then developed several hybrid soybeans resistant to common agricultural diseases, able to produce high yields, and demonstrating good seed viability.<sup>34</sup> At the same time, Pantnagar also embarked on a serious marketing campaign. Because customers disliked the taste of unprocessed soybean, which also took too long to cook, the university scientists determined that “industrial processing was the only immediate route to creating a market for soybean in India”.<sup>35</sup>

Soy could only be processed into oil and cakes through industrial machinery, so the university enlisted Prag Oil and Rice mills to install the necessary equipment. The company was able to extract all of the oil from the bean and create a soybean cake with over 50% protein. The Knave Technical Institute then used technology from the U.S. in order to convert the cakes into textured soybean protein under the brand name Nutri Nugget. Marketed as a substitute for paneer and meat, Nutri Nugget became immensely popular, and more snack foods were developed. Additionally, Knave and Prag “were so successful that the [owners] came to Pantnagar and hired four agricultural graduates each to promote soybean cultivation on contract” near their respective plants.<sup>36</sup> Gradually, more processing plants developed around the country, particularly in Madhya Pradesh “where a large area used to be left fallow in the rainy season to conserve moisture and fertility”.<sup>37</sup> The state now produces two-thirds of the country’s soy.<sup>38</sup> However, its soy yields in the past decade have been comparatively lower than the all-India average.<sup>39</sup>

---

<sup>34</sup> Singh, “Success of Soybean,” 47-49.

<sup>35</sup> Singh, “Success of Soybean,” 48.

<sup>36</sup> Ibid.

<sup>37</sup> Singh, “Success of Soybean,” 49

<sup>38</sup> Directorate, *Agricultural 2011*, 4.2.

<sup>39</sup> Directorate, *Agricultural 2011*, 4.1.20

Overall, soy production in India steadily increased until mustard-seed production (a very popular oil seed in India at the time) suddenly halted in 1998. In her book, *Stolen Harvest*, Vandana Shiva credits this to a dropsy epidemic in the county, caused by a mustard seed contamination.<sup>40</sup> There is no way to verify this through academic sources, but cultivation of mustard seeds did decrease that season by almost 2 million tons, and India imported 830,000 tons of “artificially cheap” soybeans to replace the loss.<sup>41</sup> To put the large-scale import into perspective, only two years earlier India had imported just 50,000 tons.<sup>42</sup> Production of soybeans sharply increased in India following the epidemic, and by the 1998-99 season, surpassed mustard and rapeseed<sup>43</sup> production by almost 1.5 million tons.<sup>44</sup> During the 2010-11 season, India produced 12.66 million tons of soybeans, more than twice what it produced between 1996 and 1997 and 5 million more tons than mustard and rapeseed in the same season.<sup>45</sup> In fifty years, India has progressed from producing almost no soybeans, to becoming the fifth largest producer in the world.

---

<sup>40</sup> Vandana Shiva, *Stolen Harvest: The Hijacking of the Global Food Supply*, (Cambridge, MA: South End, 2000), 24.

<sup>41</sup> Directorate of Economics and Statistics: Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, *Agricultural Statistics At a Glance 2004*, (New Delhi: Directorate of Economics and Statistics, 2004), 73, [http://eands.dacnet.nic.in/Previous\\_AT\\_Glance\\_2004.htm](http://eands.dacnet.nic.in/Previous_AT_Glance_2004.htm); United States Department of Agriculture, Foreign Agricultural Service, *Oilseeds: World Markets and Trade, 1999*, (Washington D.C.: USDA), Table 7; Shiva, *Stolen*, 24.

<sup>42</sup> United States, *Oilseeds, 1999*, Table 7.

<sup>43</sup> Mustard and rapeseed are usually calculated together. Rapeseed is referred to more commonly in the United States as Canola.

<sup>44</sup> This is particularly interesting as soy has the least oil content when compared to other oilseeds. Its oil content is 18-20%, whereas rapeseed’s is 35-60%, *The Cambridge World History of Food*, (Cambridge: Cambridge University Press, 2001) s.v. “An Overview of Oils and Fats, with a Special Emphasis on Olive Oil,” by Sean Francis O’Keefe 376; Directorate, *Agricultural 2011*, 4.18 (a), 4.19 (a).

<sup>45</sup> Ibid.

For at least the past fifteen years, soybeans have consistently been the most widely produced, imported, exported, and crushed oilseed in the world.<sup>46</sup> The crop has also taken a major place in India's oilseed economy, ranking only after cottonseed in production levels.<sup>47</sup> Oilseed consumption, too, has increased—72% in the rural regions from the 1993-94 season to the 2009-10 season and 46% in urban areas. Overall, as R.S. Deshpande and K.J. Parameswarappa explain in their chapter of *Glimpses of Indian Agriculture*, “oilseeds occupy an important position in the Indian agricultural economy; these crops cover the second largest share of an area under the cropping pattern of the country, next only to food grains”.<sup>48</sup> This is important to understand when considering the implications of the rise of soy, particularly in respect to its usurpation of mustard seed.

Mustard seed and rapeseed production increased rapidly during the post-green revolution period.<sup>49</sup> In their article in *Glimpses of Indian Agriculture*, Vijay Paul Sharma, Saradendu Patnaik, and Hiren Tilala credit this to its traditional growth as a mixed crop with wheat. “Thus, as wheat area increased rapidly in the post-green revolution period,

---

<sup>46</sup> United States Department of Agriculture, Foreign Agricultural Service, *Oilseeds: World Markets and Trade, 2012*, (Washington D.C.: USDA), Tables 15-16, <http://usda01.library.cornell.edu/usda/fas/oilseed-trade//2010s/2012/oilseed-trade-12-11-2012.pdf>.

<sup>47</sup> United States, *Oilseeds*, 2012, Table 28.

<sup>48</sup> R.S. Deshpande and K.J. Parameswarappa, “Evaluation of Oilseed Production Program in Karnataka: State Sector and District Sector Schemes,” in Jharwal et al., *Glimpses of Indian Agriculture*, 2: 63.

<sup>49</sup> The Green Revolution was a movement in India to increase production through high-yield seeds and other new technologies, particularly in the wheat and rice industries. K. Harathi and B. Deepthi Nanada, “Women Participation in Indian Agriculture,” in *WTO, Globalization, and Indian Agriculture*, ed. Mohd. Iqbal Ali et al. (New Delhi: New Century Publications, 2011), 55.

the area under rapeseed and mustard also increased.”<sup>50</sup> However, mustard had played an important role in Indian agriculture and traditions long before the 1970s. Mustard oil once lit the *diya* lamps during the *Diwali* celebrations. It served as a natural mosquito-repellent (vital in malaria-prone areas) and a therapy for muscle and joint pain. It was also the main cooking oil for most of North India.<sup>51</sup> Additionally, mustard seed, along with other indigenous oilseeds, were processed mainly through small-scale, decentralized methods, often at local markets using indigenous technologies.<sup>52</sup> This sort of crop processing has traditionally been a field dominated by women. Subsequently, as soy replaced mustard seed, as well as other oilseed varieties, it replaced the role of women in oil and seed production.

Chapter four will review, in detail, the ways in which soy represents the usurpation of women’s important roles in Indian agricultural production. Women in India are, without a doubt, the foundation of agriculture in the country. Their contributions need to be carefully considered and the introduction of soy needs to be analyzed in the context of its male-dominated production. I included a brief history to establish agricultural change and provide an example of a crop that eliminates women in India’s important role. However, this work also aims to compare women’s roles in agriculture in both the United States and India. I begin first with women in the U.S. to provide the groundwork for an analysis of contrasting roles and a wholly different recognition of gendered contributions to agriculture.

---

<sup>50</sup> Vijay Paul Sharma, Saradendu Patnaik, and Hiren Tilala, “Oilseeds and Oil Economy of India,” in Jharwal et al., *Glimpses of Indian*, 1: 165.

<sup>51</sup> Shiva, *Stolen*, 22.

<sup>52</sup> Shiva, *Stolen*, 23.

### 3. “The Invisible Farmer”<sup>53</sup>: The Neglected Role of Women in United States

#### Agriculture

As Maithreyi Krishnaraj poignantly writes in “Food Security, Agrarian Crisis, and Rural Livelihoods: Implications for Women,” “It is not an exaggeration to say the face of the farmer in India is female.”<sup>54</sup> Hundreds of books, articles, documentaries, government documents, movies, and novels can serve to further demonstrate women’s major (and recognized) role in agricultural production in India. This image of the female farmer, using generations-old knowledge to cultivate indigenous, healthful plants has been the linchpin of several environmental, food, and feminist movements not only in India, but also throughout the global South. It also serves as a stark contrast to the farmer in the United States who is indisputably portrayed as male.

In the following chapter I argue that the American farmer has historically, and mistakenly, been regarded solely as male. I provide a brief literature review of explanations as to why this misunderstanding has occurred and present evidence to show that women are, in fact, very much a key factor in agricultural production in the United States. Unfortunately, even when these roles are recognized, they are misinterpreted. I use this chapter to provide a more truthful depiction of women in agriculture and a realistic analysis of their roles, both past and present.

---

<sup>53</sup> Title of Carolyn E. Sachs’ groundbreaking work on women in U.S. agriculture. Carolyn E. Sachs, *The Invisible Farmers: Women in Agricultural Production*, (Totowa, NJ: Rowman & Allanheld, 1983).

<sup>54</sup> Maithreyi Krishnaraj, "Food Security, Agrarian Crisis and Rural Livelihoods: Implications for Women," *Economic and Political Weekly* (December 30 2006): 5385, <http://www.epw.in.proxy.libraries.rutgers.edu/review-agriculture/food-security-agrarian-crisis-and-rural-livelihoods.html>.

### “The American Farmer”

Viewers of the 2013 Super Bowl were treated to a Dodge Ram commercial entitled, “Farmer”. Opening with a sermon crediting the creation of the farmer to God’s “Eighth Day,” on which the farmer was appointed the physically demanding, life-consuming, and tedious tasks of the American farm. During the sermon, the commercial



Figure 1 Picture from Dodge Ram “Farmer” Commercial. Taken from agricultureproud.com.

features a slideshow of pictures of U.S. farmers, all men but for one woman, a little girl, and a Latina mother and her son selling food at a stand. Additionally, all of the farmers are white, but for one African American and the Latino mother/son duo. The farmer is constantly referred to with the pronoun “he,” and at the end of the commercial is described to “laugh, and then sigh, and then reply with smiling eyes when his son says that he wants to spend his life doing what dad does”.<sup>55</sup> The image of the American farmer in this commercial is undeniably male, as was the description broadcast to the over 100 million people who watched the Super Bowl, and, as of March 7, 2013, the over 14 million who had viewed the YouTube version.<sup>56</sup>

This descriptor, however, is nothing new. From the classic painting “American Gothic,” by Grant Wood featuring an American farmer holding a pitchfork with his domesticated “spinster daughter” to Pa’s roles contrasted with Ma’s in the beloved children’s series, *Little House*, the “farmer” in America has always been male. As such,

<sup>55</sup> “Official Ram Trucks Super Bowl Commercial ‘Farmer,’” YouTube video, 2:03, from the commercial televised by CBS on February 3, 2013, posted by “ram,” February 3, 2013, <http://www.youtube.com/watch?v=AMpZ0TGjbWE>.

<sup>56</sup> Ibid.

the effects of agricultural change in the United States on women in particular can be very difficult to ascertain. It was not until 2002, in fact, that the United States started including second and third farm operators in the agriculture census. This means that before 2002, if women were not the primary operators of farms, they were not statistically regarded as farm operators at all.

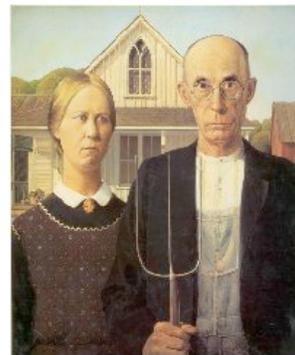


Figure 2 “American Gothic” by Grant Wood taken from Grant Wood Art Gallery webpage.

This is particularly significant as research throughout the late 1980s and early 1990s in rural sociology had already “revealed that despite agricultural modernization and mechanization, most of the so-called one-man farms still leant heavily on unpaid family labor and could not cope without extensive participation of women in daily farm work.”<sup>57</sup> Additionally, Sachs reveals that even as early as 1980, 54 percent of farmwomen in America considered themselves to be major operators of farms.

Women have always been heavy contributors to farms in the global north, but this role has consistently been overlooked. Even now, when the agricultural census has begun to research women’s positions in agriculture in the U.S. in more detail, popular culture continues to maintain their more subsidiary roles. As Sachs explains, “Immigrant women on the western frontier contributed heavily to fieldwork. European disdain for white women’s participation in fieldwork continually conflicted with the need for women’s field labor in corn and wheat production.”<sup>58</sup> During the pioneer era of the

<sup>57</sup> Bettina B. Bock, “Introduction: Rural Gender Studies in North and South,” in *Rural Gender Relations: Issues and Case Studies*, ed. Bettina B. Bock and Sally Shortall (Oxfordshire, UK: CABI Publishing, 2006), 3.

<sup>58</sup> Sachs, *Gendered Fields*, 77.

United States, women worked in the fields, despite the social faux pas. Sachs and others attribute the lack of awareness to the prevailing domestic ideology in American history, which identified rural life as the moral backbone of the country, and women's domesticity as the glue that held it together.

Gerry Walter and Susan Wilson address this domestic ideology in their article, "Silent Partners: Women in Farm Magazine Success Stories, 1934-1991." They contend that it is "propagated by social institutions and parties that diminish or ignore farm women's ownership and control of land and other farm assets."<sup>59</sup> They are surprised at the resilience of such an ideology despite the "profound technological and structural change in agriculture and turbulent gender relations in society as a whole."<sup>60</sup> The moral backbone idea emphasized by Sachs explains the need to keep women, in farm life especially, in the capacities of nurturer and caretaker. However, Walter and Wilson posit that women's portrayal in mass media maintains their subordinate roles. Although written seventeen years ago, the Dodge commercial can still apply.

### **Female Operators**

As addressed earlier, second and third operators were not counted in the agricultural census until 2002. This is particularly troubling as the majority of female operators in the United States are secondary. In the 2007 agricultural census, there were 985,192 total female operators.<sup>61</sup> 621,078 of them were second operators, and 306,209 were primary. Additionally, only 310,592 second operators were male, so the majority of

---

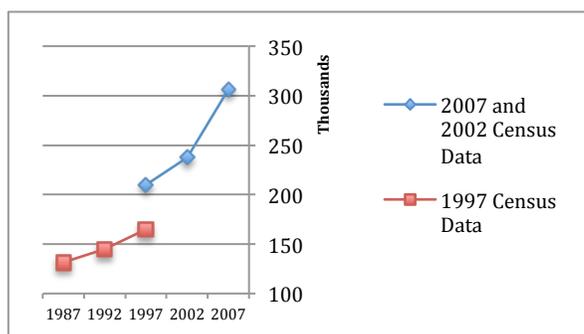
<sup>59</sup> Gerry Walter and Susan Wilson, "Silent Partners: Women in Farm Magazine Success Stories, 1934-1991," *Rural Sociology* 61(2) (2009): 227.

<sup>60</sup> Ibid.

<sup>61</sup> The 2007 agricultural census is the most recent agricultural census to be published.

secondary operators in the U.S. were female.<sup>62</sup> As such, the failure of the agricultural census to record second operators prior to 2002 discounts women's contribution as operators of farms and makes it impossible to fully understand the effects of agricultural change on women as operators in the United States. Their contributions as official farm operators are as secondary, not primary. This is beginning to change and will be addressed soon. However, it is important to note that despite women's recognition as operators by adding new levels, labor completed as a secondary or third operator is still most likely done under a man's direction or to increase his income. Sachs posits that this reinforces women's subordination in a patriarchal farming society.<sup>63</sup>

In the 2007 census, there were 306,209 female principal operators, up from 237,819 in 2002, and 209,784 in 1997.<sup>64</sup> In the 1997 census there were 165,102 general



**Figure 3 Female Principal Operators.** Data taken from US Agricultural Censuses.

female operator in 1992 and 131,641 in 1987.<sup>65</sup> Clearly, the number of farms with female operators has increased, with the sharpest slope in the past decade.

female operators for essentially the same amount of land reflected in the 2002 census. However, during this time, different types of operators were not taken into account. Additionally, there were 145,156 farms with some sort of

<sup>62</sup> United States Department of Agriculture, National Agricultural Statistics Service, *2007 Census of Agriculture*, AC-07-A-51, (Washington D.C.: USDA, 2009), 53, [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/usv1.pdf](http://www.agcensus.usda.gov/Publications/2007/Full_Report/usv1.pdf).

<sup>63</sup> Sachs, *Gendered Fields*, 129.

<sup>64</sup> Ibid.; United States Department of Agriculture, National Agricultural Statistics Service, *2002 Census of Agriculture*, AC-02-A-51, (Washington D.C.: USDA, 2004), 56, <http://www.agcensus.usda.gov/Publications/2002/USVolume104.pdf>.

Despite this overall growth in farms with female operators, the same increase has not been demonstrated in all agricultural fields. For example, there were 16,345 women principally operating oilseed and grain farms (the cash crops of the United States) in 2007, only a slight growth in operators compared to the 15,376 in 2002. The increases were mostly in vegetable and melon farming,

fruit and tree nut farming, poultry and egg production, sheep and goat farming, and “other crop farming”.<sup>66</sup> This, of course,

meant that women as principal farmers

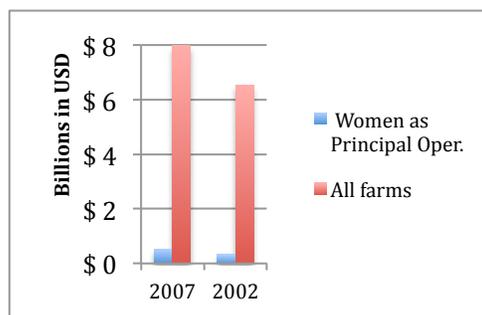


Figure 4 Government aid distributed. Data taken from 2007 and 2002 agricultural censuses.

received less government payments. In 2007, women principal operators received \$511,763,000 in government aid, while there was a total of \$7,983,922,000 distributed, and in 2002, women principal operators received \$322,681,000 compared to the \$6,545,678,000 total.<sup>67</sup> Government aid mirrors the growth of women as principal operators; however, they are clearly still at a significant disadvantage in the world of agriculture-for-profit. Government grants are essential to have a significant role in world trade and large-scale farming.

Here, I attempt to demonstrate two aspects of women as farmers in the United States. Firstly, their roles as operators have traditionally been ignored, leading to the iconic image of a man as the traditional American farmer. Secondly, that although women’s roles as operators are increasingly becoming recognized (and there are more

<sup>65</sup> United States Department of Agriculture, National Agricultural Statistics Service, *1997 Census of Agriculture*, AC97-A-51, (Washington D.C.: USDA, 1999), 24, <http://www.agcensus.usda.gov/Publications/1997/index.php>.

<sup>66</sup> United States, *2007 Census of Agriculture*, 54.

<sup>67</sup> United States, *2007 Census of Agriculture*, 54 and 15.

women operators today as well) the increases have not been in the lucrative sectors of American agriculture. Because of this, they do not receive the all-important government subsidies, the support of powerful lobbies, or strength in the commodities market. Consequently, despite women's growing roles as operators of farms (both because of growing recognition and increased individual ownership), the power in agricultural production still remains in the hands of male farmers.

### **Is the female farmer necessarily organic?**

This uneven power distribution has led to the association of women farmers in the United States with organic farming. While women as principal operators make up approximately 14 percent of total principal farm operators, they account for over 25 percent of principal operators of organic farms.<sup>68</sup> Organic farms are rarely subsidized, nor do they typically produce cash crops. This would explain why women receive less government funding and do not participate in the more profitable areas in American farming. What is most interesting, however, is the extent to which women as farmers are associated with organic farming. A quick search on the Internet for women's agricultural groups, or glancing through the short webpage of the "USDA Women Outreach Program," will lead to several organizations looking to support women in agriculture. Almost all of them, however, are catered to women engaged in small-scale organic farming.

As of February 1, 2013, the "featured farmers" on the Women's Agricultural Network webpage, run by the University of Vermont, were all small-scale, organic

---

<sup>68</sup> United States, *2007 Census of Agriculture*, 52 and 53.

farmers, mostly growing vegetables to sell within their communities. Furthering the cause, the Women, Food, and Agricultural Network (WFAN) describes its programs as

working with women landowners to educate them about conservation methods they can implement on their land...bringing together women in sustainable agriculture... and providing information and tools to help women become advocates for sustainable agriculture and healthy food systems in their own communities and at the state and federal levels.<sup>69</sup>

WFAN treats sustainability and health awareness as primary goals of women farmers, as do the multitude of other organizations that can be found throughout the United States.

Farmerjane.org also preaches local, organic agriculture. However, to its credit, it is one of the few websites to acknowledge the lack of women in Dodge's commercial. This is in contrast to the American Agri-Women website whose homepage as of February 16, 2013, featured a page-long thank you to Dodge for its recognition of American farmers' hard work and its declaration that 2013 will be the "Year of the [male] Farmer".<sup>70</sup>

While women no doubt participate in organic food production in the United States, the extent of their involvement is highly exaggerated by these organizations. There are only 20,437 farms in the country that grow organic products. While there are 4,525 female principal operators of these farms, women do not make up the majority of organic farmers, nor do organic farms come close to competing with the 2,204,792 total farms in the United States.<sup>71</sup> Of course, not all farms that grow organically are classified by the USDA as organic, but that would hardly add enough to compete with the over 2 million total farms in the country. Contrary to their portrayal by agricultural groups, the

---

<sup>69</sup> "Programs," Women, Food, and Agricultural Network, accessed February 1, 2013, <http://www.wfan.org/Programs.html>.

<sup>70</sup> "Welcome to American Agri-Women: Agriculture Gives Big Thanks to Ram Trucks for So God Made a Farmer Super Bowl Commercial," American Agri-Women, accessed February 16, 2013, <http://www.americanagriwomen.org/>.

<sup>71</sup> United States, *2007 Census of Agriculture*, 52 and 7.

majority of women farmers engage in animal production, beef cattle ranching and farming, and other crop farming.<sup>72</sup> However, their moneymaking capabilities, federal farm program participation, and market competition are significantly lower than their male counterparts.

The majority of farms operated principally by women (104,739 in 2007) made less than \$1,000 per year, 47,480 made between \$1,000 and \$2,499 in 2007, and 39,662 made between \$2,500 and \$4,999.

Only 25,600 made \$50,000 or more in 2007.<sup>73</sup>

By contrast, 482,615 total farms in 2007 made over \$50,000.<sup>74</sup> What was also interesting was that in the overall agricultural census, farm income was calculated in increments of \$50,000 to \$99,999, \$100,000 to \$499,999, and \$500,000 and above.<sup>75</sup> However, farms operated by women were only counted as \$50,000 or more. This is most likely because there were so few farms that qualified in this category.

As women generally take very little part in the most lucrative farm industries (oilseed and grains), their earning potential as farm operators is significantly lower. Consequently, only 8,182 farming households operated by women received their total income from the farm in 2007, and 184,410 of female principal operators had a primary occupation other than farming.<sup>76</sup> However, this has been a significant factor in farming

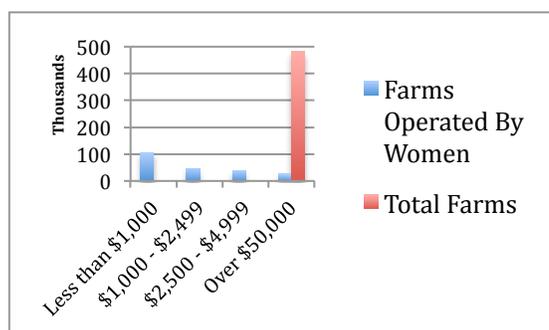


Figure 5 Number of farms operated by women. Data taken from 2007 Census of Agriculture.

<sup>72</sup> United States, *2007 Census of Agriculture*, 54.

<sup>73</sup> Ibid.

<sup>74</sup> United States, *2007 Census of Agriculture*, 7.

<sup>75</sup> Ibid.

<sup>76</sup> United States, *2007 Census of Agriculture*, 55.

for many years. Rosenfeld argues that the only way family farms have been able to stay alive has been by members of the family working off the farm to provide supplementary income.

As farms began to need more capital, the need for cash grew, and so did off-farm employment. Previously, women in farm families had produced most necessities in the home. They would sew the clothes, make soap and butter, can their own foods. There was almost no need for cash. However, through mass production, such goods became cheaper to purchase at stores than to produce, and any cottage industries being run out of the farm homes to produce small capital also became more expensive and outdated.<sup>77</sup> Additionally, “mechanization, a component in the increasing capitalization and centralization of U.S. farms, . . . meant that cash (and credit) was needed to purchase machinery.”<sup>78</sup> These changes in American consumer culture and agricultural systems increased the need for outside capital and made farms less independent. Hence, members of the family needed to work off the farm.

Depending on the situation, men or women will take outside jobs. Men generally have better moneymaking potential, but their manual labor is also thought to be more necessary to the continuation of the farm. Larger machines have not been built for women to use (e.g. inability to reach tractor pedals), but there are still tasks that need to be done by hand in which women more frequently take part. Women, however, have often historically taken off-farm jobs to assist in the family income. Rosenfeld notes Laura Ingalls’ myriad of occupations to help earn money for the family in the *Little*

---

<sup>77</sup> Rachel Ann Rosenfeld, *Farm Women: Work, Farm, and Family in the United States*, Chapel Hill: The University of North Carolina Press, 1985, 20.

<sup>78</sup> Rosenfeld, *Farm Women*, 22.

*House* series. While the need for capital certainly grew more quickly recently, there is a historical precedent for female off-farm labor in the United States.

There are many other factors of note for the farms with women as principal operators. For example, on the majority of these farms the women principal operators were not hired managers (only 6,394 in 2007 and 5,505 in 2002). They typically ran family or individual organizations and worked as single operators.<sup>79</sup> These operators were also mostly white (287,092 in 2007 and 229,587 in 2002) and were in their mid to late 50s, only slightly above the average age.<sup>80</sup> (Most farm operators in general are mostly white.) In addition, farms run by women as principal operators were between 10 and 49 acres, and most of the operators fully owned their own farms.<sup>81</sup>

There are several dimensions that can be explored concerning women as principal operators of farms. The age and race statistics are true throughout the United States, not just when examining women as operators. Additionally, the somewhat older age of the operators reflects the national trend of farms as more retirement-based or supplemental income generators. More farmers than ever have to work off the farm to earn enough income for the family. This, however, will be discussed in further detail in Chapter 5. I have meant, at this point, to dispel the more common misconceptions about women as farm operators: that they are only organic and that they do not exist. I also wanted to reaffirm many assumptions: that female farmers are at a disadvantage generally, they do not earn as much money, they do not receive as much government support, and their farms are typically smaller-scale. Women's only roles on farms in the United States,

---

<sup>79</sup> United States, *2007 Census of Agriculture*, 54.

<sup>80</sup> United States, *2007 Census of Agriculture*, 53 and 55.

<sup>81</sup> United States, *2007 Census of Agriculture*, 54.

however, are not as operators. They make immense contributions as laborers, but this has not traditionally been recognized.

### **Women as Farm Laborers**

There can be many explanations for women's exclusion from agricultural perceptions. Surely the idea of rural America as the country's moral goal carries weight. But even more simply, it is the lack of feminist inquiry that has led to what is now regarded as an extraordinary undervaluation of women's work in agriculture. Because most of the critical works on women in U.S. agriculture were written in the 1980s and 90s, every author brilliantly expounded upon the failure of sociologists and economists to, before that point, acknowledge unpaid labor as work. Sachs offers an excellent summary and further explanation of women's previous exclusion from recognition.

Evaluation of labor usually measures wage labor by using time or money as standards. However, standard methods of evaluating work that rely on these measures have little relevance for measuring work on farms that is not based on wages. The attempt to separate the categories of farm and farm household, the site of both production and reproduction, to measure women's work is artificial. Women perform productive and reproductive tasks simultaneous or a single task might include elements of production and reproduction.<sup>82</sup>

Hence a two-pronged confusion occurs. Women's work on farms is often unpaid, leading to their exclusion from labor measurements. Additionally, female labor on family farms often includes household work (such as bringing children while milking cows, providing child care and manual labor) or work in the house includes farm work. This made traditional means of analyzing work (as separate from the home) difficult,

---

<sup>82</sup> Sachs, *Gendered Fields*, 130.

especially for earlier understandings of labor and economics prior to the first sociological inquiries of women in U.S. agriculture.

Bock summarized the situation best in her literature review of early work on women in U.S. agriculture. She investigates the ways in which these early sociologists, particularly Sachs and Rosenfeld, broke through the contemporary misunderstandings of the ways women's work was comprehended.

They criticized statistics that tended to underestimate women's and overestimate men's farm work by using 'masculine' definitions of farm-work. Many tasks of women were considered as household labor and not counted as 'farm work'. They also revealed that the multitasked nature of women's work contributed to the underestimation of their engagement. Farm tasks undertaken within the house were overlooked and forgotten when farm labor was measured. The definition of farmwomen as 'assistant', 'wife' and 'homemaker' rendered her involvement in farm work invisible and secondary to her primary and publicly prominent tasks in the home.<sup>83</sup>

Before this point, work in the global north was only understood using post-industrialization understandings as a job held outside the home in return for payment.<sup>84</sup> This, of course, has changed with the advancement of feminist economics, but not fully in the realm of agricultural America.

While recent information on women farm operators was relatively easy to find, current statistics for female farm laborers continue to be incredibly elusive as many farm laborers are immigrants. If they are undocumented, the government has difficulty counting them because they typically move around (following farm seasons) over the period in which population surveys take place. Additionally, even if they remain in the same place, most are often reluctant to take part in government surveys. The Current Population Survey has been trying to weigh responses to include those who do not take

---

<sup>83</sup> Bock, "Introduction," 3.

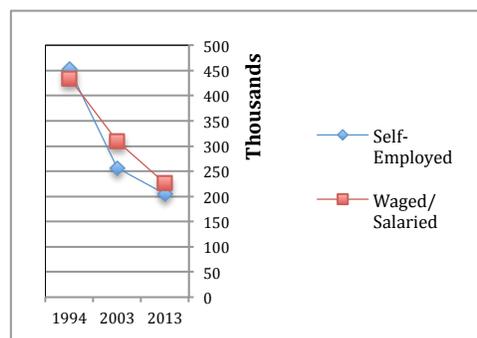
<sup>84</sup> Rosenfeld, *Farm Women*, 5.

part, but a fully accurate account of who is working on what farm cannot include all unauthorized workers.<sup>85</sup> This significantly affects the numbers as a 2008 USDA report estimated that close 50 percent of all farmworkers are undocumented.<sup>86</sup> Therefore, much of what I found through the Current Population Survey cannot be fully reliable, but it can give a relative idea of the female/male comparison in the agricultural industry.

As of January 2013, there were 205,000 self-employed women working in agriculture and 531,000 self-employed males. There were also 226,000 waged and salaried females (a small increase from self employed) compared to the 897,000 waged and salaried males, and 11,000 unpaid female family workers and 25,000 unpaid male family workers.<sup>87</sup> These numbers are all

smaller than the count in 2003, where there were

694,000 self-employed male workers and 257,000 female self-employed workers in agriculture; 991,000 male waged and salaried workers and 309,000 female; and 11,000 unpaid male family workers and 14,000 female.<sup>88</sup> In 1994, there were 1,227,000 self-



**Figure 6 Female workers in agriculture.** Taken from Current Population Survey data.

<sup>85</sup> United States Department of Agriculture, Economic Research Service, *Profile of Hired Farmworkers, A 2008 Update*, by William Kandel, Economic Research Report Number 60, (Washington D.C.: USDA, July 2008), 52, [http://www.ers.usda.gov/media/205619/err60\\_1\\_.pdf](http://www.ers.usda.gov/media/205619/err60_1_.pdf).

<sup>86</sup> United States, *Profile of Hired Farmworkers*, 5.

<sup>87</sup> Bureau of Labor Statistics (“Household Data, Not Seasonally Adjusted: A-22 Employed persons in agriculture and nonagricultural industries by age, sex, and class of worker,” Labor Force Statistics from the Current Population Survey, accessed February 16, 2013), <http://www.bls.gov/web/empsit/cpseea22.pdf>.

<sup>88</sup> Bureau of Labor Statistics (“Household Data, Annual Averages: 15. Employed persons in agriculture and related and in nonagricultural industries by age, sex, and class of worker,” Labor Force Statistics from the Current Population Survey, accessed February 16, 2013), <http://ftp.bls.gov/pub/special.requests/lf/aa2003/pdf/cpsaat15.pdf>.

employed male workers in agriculture and 452,000 women. As far as waged and salaried workers, there were 1,499,000 men and 434,000 women.<sup>89</sup> Interestingly, in all categories the number of women working in agriculture decreased. There was a sharper decrease in self-employed women in agriculture between 1994 and 2003 than in waged and salaried work, which most likely correlates with the loss of mid-sized, family farms in the country.

In contrast to the data shown above, the number of women employed in agriculture (as calculated by the Bureau of Labor Statistics) overall has remained relatively stable from 1972 to 2012. There was a brief spike in the mid-1990s, which explains the high numbers shown in Figure 6. Unfortunately, prior to 1994, it is impossible to find data combining industry with class of worker (meaning broken down into self-employed or waged/salaried in order to indicate a trend in type of work), as the Current Population Survey did not break down their questions in such a way. However,

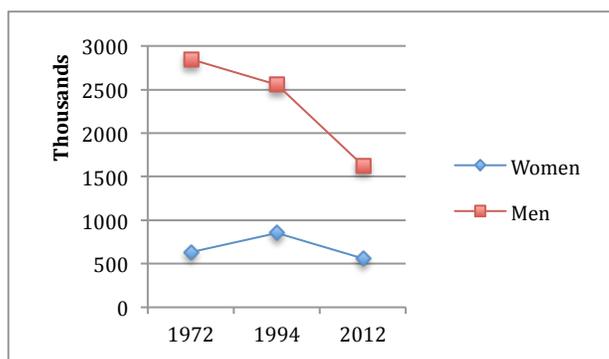


Figure 7 Agricultural Laborers in the United States. Data taken from Current Population Survey.

what can be determined is that there were 635,000 women working in agriculture in 1972, 855,000 in 1994, and 560,000 in 2012. It may be also important to note that the number of men working in agriculture throughout

<sup>89</sup> Bureau of Labor Statistics, “Unpublished detailed occupation and industry tables, Current Population Survey (CPS), Bureau of Labor Statistics: Table 8. Experienced civilian labor force and employment by detailed industry, class of worker, and sex, Annual Average 1994(based on CPS).”

the same period has decreased substantially from 2,849,000 to 1,626,000.<sup>90</sup> Men working in agriculture have clearly been affected to a greater degree by the industrialization of U.S. agriculture, but this will be discussed further in a later chapter.

I have set up this chapter in order to provide a context through which to investigate women in agriculture through the production of soy. Providing a specific crop allows a narrow investigation of the situation of women in agriculture in the United States. Unfortunately, the project proved much more difficult than with India (which will be discussed in Chapter Four). As hard as it may be to determine how women's agricultural labor has been affected over time, finding women's relationship to soy is even worse. Even Sachs could not find labor relationships to specific crops.<sup>91</sup> I use examples from Iowa, however, and other data in order to present a realistic idea of the status of women in the soy industry. Here, the crop serves as an example of women's exclusion from the more profitable industries in American agriculture and the disadvantages that female farmers face.

### **Women and Soy**

As described earlier, women as farm operators are typically not involved with any of the major cash crops—soy being the second most lucrative crop in the United States. Even more indicative of their relatively low involvement is that the Midwest region (which grows the most soy in the country) has the smallest percentage of female

---

<sup>90</sup> Bureau of Labor Statistics ("Household Data, Annual Average: Current Population Survey: 2. Employment status of the civilian non-institutional population 16 years and over by sex, 1972 to date," Labor Force Statistics from the Current Population Survey, accessed February 16, 2013), <http://www.bls.gov/cps/cpsaat02.pdf>.

<sup>91</sup> Sachs, *Gendered Fields*, 78.

operators.<sup>92</sup> Iowa, the nation's largest producer of soy, has only 8,452 farms with a woman principal operator, out of the state's 92,856 total farms.<sup>93</sup> To further the comparison, the total amount of land in farms in Iowa amounts to 30,747,550 acres as of 2007.<sup>94</sup> In contrast, women as principal farmers only have 1,090,979 acres.<sup>95</sup> This leads to an average of 331 acres per farm in Iowa, but only an average of 129 acres for farms with women as principal operators. It is worth noting, however, that the median farm size in Iowa is 151 acres, far different from the average. This results from a small concentration of large farms (only 7,451 with 1,000 acres or more), and a higher concentration of (relatively) smaller farmers. Meanwhile, 36 percent of the farms in Iowa make over \$100,000 annually and 29 percent make less than \$2,500, further demonstrating the inequality in agriculture that results in the cash crop market.<sup>96</sup>

In terms of soy, 1,348 farms with women as principal operators grew soy in Iowa in 2007, while 41,524 total farms grew soy statewide.<sup>97</sup> Additionally, the majority of the farms in Iowa with women as principal operators had an economic value of less than \$2,500 annually (62 percent). It comes as no surprise then, that 70 percent of these women had a primary occupation other than farming and 55 percent worked days off of the farm.<sup>98</sup> What all of these numbers come together to show is that women as farm

---

<sup>92</sup> United States, *2007 Census of Agriculture*, 630.

<sup>93</sup> United States, *2007 Census of Agriculture*, 483, 278, 631.

<sup>94</sup> United States, *2007 Census of Agriculture*, 278.

<sup>95</sup> United States, *2007 Census of Agriculture*, 631.

<sup>96</sup> United States, *2007 Census of Agriculture*, 278.

<sup>97</sup> United States, *2007 Census of Agriculture*, 483; "Iowa: Farms with Women Principal Operators, 2007 Census of Agriculture," United States Department of Agriculture, accessed February 18, 2013, [http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/Race,\\_Ethnicity\\_and\\_Gender\\_Profiles/Iowa/cpd99019.pdf](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Race,_Ethnicity_and_Gender_Profiles/Iowa/cpd99019.pdf).

<sup>98</sup> "Iowa: Farms with Women."

operators are not only the minority, but also excluded from most money-making sectors of the industry. While the association of women with organic agriculture that overwhelms the discourse on women in the field may be exaggerated, there is certainly some truth to the idea that their farms are often small-scale. The consequences of these characteristics will be discussed later, with an overview of U.S. agriculture as a whole. What I wanted to emphasize here, however, was the extent to which men dominate the agricultural field in the U.S., that the American farmer is unquestionably perceived of as male, and that women as farmers in the U.S. serve as a direct contrast to those in India.

The relationship to soy however, remains unclear. In India, the effects of the soy industry can, at least theoretically, be determined. The introduction of soy to India represents an overall change in their agricultural system, a far cry from Gandhi's village economies. The United States agricultural system, however, was predicated upon the type of crop production that soy uses. Farms in America have been plantation-based since colonial times. As Mintz, Tan, and Du Bois explain in their introduction to *The World of Soy*, "The successes of plantations in sugar, tobacco, indigo, coffee, and cotton in the Americas were early stages in the development of a global agricultural system of production to serve an emerging world market, the very market that would eventually trade in soybeans on a vast scale."<sup>99</sup> This plantation system paved the way for the soy industry, and built United States agriculture (after colonialism) on the idea of large monocultures, specialization in commercial crops, employment of massed, seasonal, unskilled workers, and a significant dependency on the world market.<sup>100</sup>

---

<sup>99</sup> Mintz et al., "Introduction," 3.

<sup>100</sup> Mintz et al., "Introduction," 4.

Therefore, unlike in India, American women have weathered fewer overall changes in their agricultural system. Farming for most has always been a business, rather than for individual subsistence, excluding the early days of settlement in the Midwest. The changes that soy can indicate for women develop mostly as members of farming families, whose slow change in circumstance I will discuss in a later chapter. I use the example of soy in the U.S. to demonstrate women's exclusion from the lucrative aspects of agriculture, and to later highlight the ways in which a foreign crop has dominated America. Agricultural women in the U.S. also serve as a stark contrast to those in India and show how the effects of industrialization in farming can develop in different ways.

#### 4. “The Face of the Farmer in India is Female”<sup>101</sup>

Unlike in the United States, agricultural production in India has evolved through hundreds of years of seed collection and traditional knowledge. Primarily conducted and transmitted over generations, women’s work in agriculture served to establish food security and nutritious local cuisines throughout India’s history. Female farmers in India protect crops from pests, ensure successful harvests, enrich soil, and preserve the best seeds.<sup>102</sup> Women in agriculture possess specialized knowledge, which can only be gained through experience and generations of learning.<sup>103</sup> Their important role in agriculture is well known. However, recently, this function has been threatened.



Figure 8 Personal Photo, Seed Bank at Navdanya Farm, Dehradun, India.

#### Women and Soy

Along with many other crops taking over Indian agriculture, soy is too new to have been bred over generations and grown in conjunction with the perfect crops. In fact, the common strains used in India were created in a lab. Women played no role in its introduction, and have been excluded from its production, pressured through advertising

<sup>101</sup> Krishnaraj, "Food Security," 5385.

<sup>102</sup>P. Mercy Kumari, K. Mahendra Kumar, and B.S. Rao, “Globalization and the Changing role of Women in Agriculture,” in *WTO, Globalization, and Indian Agriculture*, ed. Mohd. Iqbal Ali et al. (New Delhi: New Century Publications, 2011), 72-74.

<sup>103</sup> Maithreyi Krishnaraj and Amita Shah, *Women in Agriculture*, (New Delhi: Academic Foundation, 2006), 67.

campaigns and industry force to make it part of a new traditional cuisine.<sup>104</sup> Soy's institution excludes women from oilseed production as it now dominates the field. It serves as one of many examples of the ways in which new agricultural systems have undermined women in food production and favored industry over tradition. As Krishnaraj and Shah pointedly argue, "Indian women farmers have many levels of experience, which have not been recognized and built upon."<sup>105</sup> Instead, new agricultural methods alienate these experiences by relegating agricultural women's labor in ways that disregard their valuable knowledge and skill-set.

Singh demonstrated that the introduction of soy to India was predicated solely upon industrial processing. This inherently excludes women from its production as men are more often called upon for technological and industrial work. The increased mechanization resulting from the rise of soy has undermined women's importance in food production.<sup>106</sup> In their article, "Women Participation in Indian Agriculture," K. Harathi and B. Deepthi Nanada illustrate,

Women have always been repositories of rich indigenous knowledge... passed down over generations. They have been the primary seed keepers and food processors. However these roles have changed as a consequence of mechanization and changing cropping patterns to high yielding varieties and monocultures that have completely replaced traditional farming knowledge with the use of hybrids.<sup>107</sup>

This has been true throughout Indian agriculture, but oilseeds (particularly soy) provide a remarkable demonstration, as soy requires industrialized processes in order to produce oil.

---

<sup>104</sup> Singh, "Success of Soybean," 47-48.

<sup>105</sup> Krishnaraj and Shah, *Women*, 67.

<sup>106</sup> Bagchi, Deipica, "Women in Agrarian Transition in India: Impact of Development," *Geografiska Annaler. Series B, Human Geography* 63, no. 2 (1981), 113.

<sup>107</sup> Harathi and Nanada, *Women Participation*, 65-66.

Many authors have made note of the change in the oilseed sector and its effects on women. In her article written over thirty years ago, Deipica Bagchi notes, “In cotton and oilseed regions [of Madhya Pradesh], practically entire rural populations inclusive of the communities of oil extractors by cast of *telis* have been made dependent on mechanical extraction processes.”<sup>108</sup> Even before the rapid rise of soy, industrialization through mechanization of agriculture began to take hold. She explains further, “Agricultural crop processing has traditionally been the major female involvement. The sex roles in processing of agricultural produce are being disturbed to a great extent by the mechanization of processing activities.”<sup>109</sup> Soy’s growth had already started to increase steadily during this time in Madhya Pradesh and is completely dependent on mechanical extraction processes. While soy is not solely responsible for the change in the state, its introduction clearly undermined women’s vital roles as food producers.

Harathi and Nanada also emphasize the drastic effect of women’s loss of control over production. They claim it “disturbs work patterns, employment opportunities, and ultimately the complete household food security system.”<sup>110</sup> Additionally, they identify other consequences such as “increase in migration, female-headed households, increased dependence on casual wage labor, exploitation, and increased health risks.”<sup>111</sup> Many of these health risks have been well documented. For example, 24 million more women than men in India are undernourished.<sup>112</sup> Additionally, 52 percent of married females in

---

<sup>108</sup> Bagchi, *Women in Agrarian*, 113.

<sup>109</sup> Ibid.

<sup>110</sup> Harathi and Nanada, *Women Participation*, 64.

<sup>111</sup> Ibid.

<sup>112</sup> “Country Profile: Food Security Indicators, Country: India,” Food and Agricultural Organization, last modified October 2010, 5,

the country suffer from anemia and 41.2 percent of rural women (22.7 urban) have a BMI below 18.5 (the level of chronic energy deficiency).<sup>113</sup> Most importantly, women cannot continue to cook traditional, nutritious meals. These often require long preparation time, and the cost of food around the world has risen exponentially. In households where female labor participation is high, and women continue to be responsible for providing daily meals, those meals will inevitably become less nutritious.<sup>114</sup>

Health consequences are certainly part of a major and much larger discussion on soy, which cannot be confronted in this thesis. However, Bagchi summarizes the situation well,

Necessarily viewed as an advancement, the mechanization process is supposed to be realizing labor for other activities. In reality, however, mechanization of crop processing has not only been eroding away the female employment channels and income opportunities, but also interfering with her status by disposing her of specific services to family and village society.<sup>115</sup>

We now know that female employment remains high depending on the type of crop and work, but there have been a myriad of consequences resulting from these new types of work opportunities. They have certainly interfered with women's more traditional roles in caring for the family and, for rural women, contributing to village society through care of communal natural resources and other important occupations. In a world in which women continue to be the sole family caretakers (United States included, particularly in rural, agricultural families), the interference of mechanization that Bagchi describes does

---

[http://www.fao.org/fileadmin/templates/ess/documents/food\\_security\\_statistics/country\\_profiles/eng/India\\_E.pdf](http://www.fao.org/fileadmin/templates/ess/documents/food_security_statistics/country_profiles/eng/India_E.pdf).

<sup>113</sup> Krishnaraj, "Food Security," 5386.

<sup>114</sup> Harathi and Nanada, *Women Participation*, 64.

<sup>115</sup> Bagchi, *Women in Agrarian*, 113.

significantly affect women's abilities to continue their necessary tasks and also a family's ability to function.

### **Women working in agriculture**

Female labor participation is relatively high as there have been significantly increased demands on women working in agriculture, particularly through casual labor. Although the demands on labor continue to be high in certain areas of agriculture, the resulting benefits for women have been uneven along class lines. "Mechanization has displaced women in the landless class, though landed class women gained through less drudgery."<sup>116</sup> In any case, it is difficult to group all women in every region of agriculture and India together in terms of the consequences and benefits resulting from advancements in agriculture.

What can be determined overall, is that women's agricultural labor characteristically differs from men's in that it does not involve complex tools and, therefore, relies more heavily on human energy.<sup>117</sup> As Harathi and Nanada explain, "Women's labor is preferred for labor-intensive works in production of cash crops, emerging agri-businesses/food processing units, special export zones, non-farm industrial activities or even outsourcing piece rate works thereby encouraging gender inequality."<sup>118</sup> Consequently, the advantages of advancements in agriculture have been experienced unevenly. Additionally, the demand for female labor varies according to fields. Some areas of agriculture, such as irrigated wheat, have had technological advances to the point

---

<sup>116</sup> Harathi and Nanada, *Women Participation*, 64.

<sup>117</sup> Harathi and Nanada, *Women Participation*, 55.

<sup>118</sup> Harathi and Nanada, *Women Participation*, 64.

that female labor is no longer necessary. In other areas, such as rain fed wheat, the demand for female labor continues to grow.<sup>119</sup>

Krishnaraj also notes in her article that when new seeds (such as those introduced in the Green Revolution) become less labor intensive by using chemicals in the place of manual work, women and other agricultural laborers lose jobs. Weeding and harvesting have traditionally been the work of female agricultural laborers, but herbicides and mechanization have reduced the demand. On the other hand, Krishnaraj suggests that the institution of chemicals and machines have helped some land poor and landowning women by reducing their personal work loads.<sup>120</sup> The shift in agricultural production in India reflects inequalities within national and gendered boundaries. These changes in production help some women while hurting others. These differences are demonstrated along class lines, particularly between the land-owning and landless classes.

In any case, women have clearly been affected by the indicated changes in agriculture through mechanization and industrialization. Harathi and Nanada summarize,

Shift from subsistence to market economy has a negative impact on women: The Green Revolution, which focused on increasing yields of rice and wheat, entailed a shift in inputs from human to technical. Women's participation, knowledge, and inputs were marginalized, and their role shifted from being 'primary producers to subsidiary workers'. When technology has been introduced in place where women work, women laborers have often been displaced by men.<sup>121</sup>

The changes seem to be coming here from all sides. Women's traditional roles are being usurped, their function as laborers being taken over by men. While Harathi and Nanada, like many other authors referenced in this work, cite the Green Revolution as the point of change, these ideas can be translated into the example of soy. Soy is not solely

---

<sup>119</sup> Krishnaraj, "Food Security," 5385.

<sup>120</sup> Ibid.

<sup>121</sup> Harathi and Nanada, *Women Participation*, 55.

responsible for these changes in mechanization, but instead symbolizes agriculture's increasing reliance on new ways of producing food. Technology is being created for various cash crops throughout the country, but the results have unquestionably been to the detriment of women.

Overall, technological advancements in agriculture have excluded women's needs. Research has been geared towards the needs of male farmworkers. As Singh, Gite, and Argarwal explain in their article on farm tools for women in India,

Despite their pivotal role in agriculture, most of the women are using age-old traditional tools and equipment (hand hoe [khurpa] and plain sickle) till date. Though various research organizations and state agricultural universities in the country have done considerable work on design and development of improved farm tools and equipment, they are mostly suitable for use by men.<sup>122</sup>

Consequently, advances in agricultural technologies have not necessarily been for women in the field. The investment in technology has been for the primarily male-dominated areas in agriculture.

Meanwhile, women continue to be preferred for labor-intensive jobs, particularly in cash crops and emerging agri-businesses without the added benefit of advanced farming tools. For example, women most often participate in the “transplanting, weeding, and harvesting” of crops, while men participate in land-preparation activities performed with the technology.<sup>123</sup> Sachs points to women's tendency to do the work “the closer the food is to the table,” and this work unfortunately requires more manual

---

<sup>122</sup> Shiv Prata Singh, Laxan Puna Ji Gite, and Nidhi Argarwal, “Improved Farm Tools and Equipment for Women Workers for Increased Productivity and Reduced Drudgery,” *Gender, Technology and Development* 10:2 (2006), 229-230, accessed December 1, 2012, doi: 10.1177/097185240601000204.

<sup>123</sup> Sachs, *Gendered Fields*, 72.

labor.<sup>124</sup> She also claims that it may perhaps be a consequence of male control of agriculture, which has occurred globally as a result of the prevalence of cash-crop farming taking over where subsistence farming, and hence female-dominated farming in India, once reigned.<sup>125</sup>

Women's working roles are important to note, as they more often perform the weeding in India when growing soy, which is classified as "heavy work" in the article by Singh, Gite, and Argarwal. However, using the traditional hand hoe (*Khurpa*), the output was only 45 square meters per hour. With the technology of the twin wheel hoe, found by the National Research Center for Women in Agriculture to be appropriate for women based on their relatively lower aerobic capacity, the output with soy more than tripled to 150 square meters per hour.<sup>126</sup> The hoe also eliminated the need to squat while farming. However, the machine required a work pulse of 41 beats per minute, which was higher than the 40 allowed as an "acceptable limit for continuous operation".<sup>127</sup> What this shows is that while the technology allows women farmers to save time, it also forces further physical strain at a time when they are needed most on farms.

Subsistence farming has become increasingly feminized as men take part in the mass urban migration sweeping the Global South.<sup>128</sup> As Harathi and Nanada explain, "increased male labor mobility has left women fully in charge of agricultural production on small family farms in highly competitive markets, especially when they have no

---

<sup>124</sup> Ibid.

<sup>125</sup> Sachs, *Gendered Fields*, 68.

<sup>126</sup> Singh, et al., "Improved Farm Tools," 235.

<sup>127</sup> Singh, et al., "Improved Farm Tools," 235, 240.

<sup>128</sup> Sachs, *Gendered Fields*, 69,

access to information, resources and inputs.”<sup>129</sup> Demands on women are coming from both sides—to earn money through wage labor and also to maintain subsistence farming in a country where the shift to a market economy has characterized its agricultural sector since the Green Revolution.<sup>130</sup> How have women coped with such changes in their lives? What should women prioritize? Making money? Maintaining farms? What results from the increased work opportunities made available because of male migration?

There can be no doubt that there are increased working opportunities as a result of India’s industrialization. However, as Maithreyi Krishnaraj and Amita Shah emphasize, “Increased employment has often meant increased workload without greater

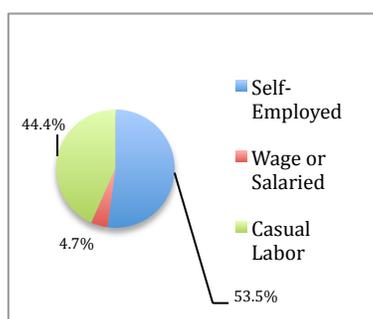


Figure 9 Rural Female Laborers; Data taken from India NSS 66th Round

empowerment.”<sup>131</sup> 39 percent of rural women in India between the ages of 15 and 59 engage in the workforce.<sup>132</sup> However, this work is often unreliable and underpaid. This statistic, taken by the National Sample Survey Office of India,

measured those who had

worked for a “relatively long part of the 365 days preceding the date of the survey.”<sup>133</sup> Therefore, it did not account for seasonal fluctuations, which can be particularly important in the rural areas. When measured as a daily status (meaning having

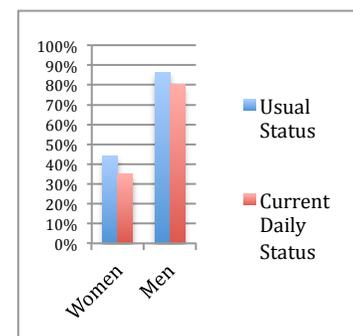


Figure 10 Data taken from NSS 66<sup>th</sup> Round.

<sup>129</sup> Harathi and Nanada, *Women Participation*, 64.

<sup>130</sup> Harathi and Nanada, *Women Participation*, 55.

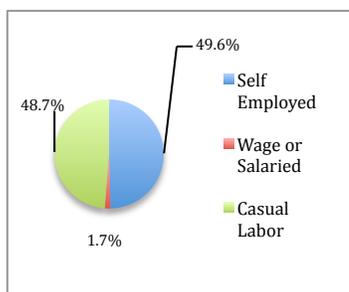
<sup>131</sup> Krishnaraj and Shah, *Women*, 91.

<sup>132</sup> National Sample Survey Office, Government of India, Ministry of Statistics & Programme Implementation, *India- Employment and Unemployment: NSS 66<sup>th</sup> Round*, DDI-IND-MOSPI-NSSO-66-10-2011 (New Delhi: NSSO, 2011), 11.

<sup>133</sup> National Sample, *India*, 10.

worked during a number days in a chosen work-week), the percentage of rural women between the ages of 15 and 59 engaging in the workforce drops to 27 percent.<sup>134</sup> There has also been a countrywide shift, for both men and women, from regular employment to casual labor.<sup>135</sup> This is in part due to mechanization and also to a “growing social heterogeneity of wage laborers” in which non-scheduled castes and tribal groups are also seeking wage employment.<sup>136</sup> For working rural women, only 4 percent engage in waged/salaried work.<sup>137</sup> In contrast, 39.9 percent work as casual laborers.<sup>138</sup> Casual laborers are not entitled to the perquisites enjoyed by waged/salaried workers, such as reimbursement for medical treatment, free accommodation, and higher pay.<sup>139</sup> Additionally, casual labor is often unreliable, which explains the stark contrast between overall workforce participation and daily workforce participation.

In Madhya Pradesh, “the soybean state,” the numbers are even worse for rural



**Figure 11 Rural Female Laborers in Madhya Pradesh. Data taken from NSS 66<sup>th</sup> Round.**

women. Only 1.7 percent of working women have regular waged/salaried jobs, and 48.7 percent work as casual laborers.<sup>140</sup> Additionally, waged/salaried rural women workers earn an average of 138.15 rs per day (compared to the 155.87 all-India average), whereas the casual laborers earn only 58.13 rs per day (compared to the 68.94 all-India

<sup>134</sup> National Sample, *India*, 11.

<sup>135</sup> A. Vaidyanathan, *Agricultural Growth in India: Role of Technology, Incentives, and Institutions* (New Delhi: Oxford UP, 2010), 145.

<sup>136</sup> Vaidyanathan, *Agricultural Growth*, 152.

<sup>137</sup> National Sample, *India*, 15.

<sup>138</sup> National Sample, *India*, 64.

<sup>139</sup> National Sample, *India*, 18-19.

<sup>140</sup> National Sample, *India*, 64.

average).<sup>141</sup> Taking into account that 87.8 percent of working rural women in the state are in the agricultural sector, these numbers reflect the status of women farmers more so than in any other field.<sup>142</sup>

Additionally, rural women in Madhya Pradesh have a usual status work rate of 44.3 percent.<sup>143</sup> However, their current daily status is 35 percent.<sup>144</sup> In contrast, rural men have a usual status work rate of 86.4 percent and an 80.2 percent daily rate.<sup>145</sup> None of these numbers indicate increased empowerment of women. What India's national survey demonstrates, instead, is a disregard of the importance of women in agriculture. Maithreyi Krishnaraj and Amita Shah pointedly write, "The face of the Indian farmer is a woman's face. The woman farmer is the kingpin of agriculture, not just a secondary helper."<sup>146</sup> However, the numbers reflected in India's national survey, and most importantly, in its "soybean state," present women as merely subsidiary and casual participants in what was once largely their domain.

### **Women as Farm Operators**

In contrast to the National Sample Survey data, India's Agricultural Census features a growth in women's role as farm operators in all class sizes except operational

---

<sup>141</sup> National Sample, *India*, 92 and 95.

<sup>142</sup> National Sample, *India*, 75.

<sup>143</sup> Usual status measures principal work and subsidiary work combined. The principal work alone for rural women in Madhya Pradesh is 41.9 percent (India, *National*, 35); National Sample, *India*, 36.

<sup>144</sup> National Sample, *India*, 38.

<sup>145</sup> National Sample, *India*, 36 and 38.

<sup>146</sup> Krishnaraj and Shah, *Women*, 149.

holdings 10 hectares (ha.) or larger.<sup>147</sup> The largest increases, however, have been in small operational holdings (2 ha. or below). This mirrors a similar shift in increases in very small operational holdings throughout India, which will be discussed in Chapter Five in the context of Indian agriculture as a whole. It also most likely reflects the resulting changes for women due to increased male migration to the cities, which is not to be taken as an indication of increased female empowerment. Krishnaraj and Shah offer a brilliant summary,

Migration of men, especially under distress situations, should imply more work burden for women rather than being seen as a positive development towards women's empowerment or gender equity. This is so because, empowerment does not merely come from workforce participation or autonomy in conducting a particular productive task (in absence of men); rather, it emanates from structural changes in ownership and control over productive resources on the one hand, and the loosening of the class/caste based hierarchies within society on the other.<sup>148</sup>

While patriarchal ideals still reign, the act of leaving women alone to care for families, farms, and wage earning hardly qualifies as a catalyst for empowerment. While the increases in female operated holdings demonstrated by India's agricultural census seemingly show an increase in female empowerment, the existing attitudes towards women in India need to be taken into account.

Women's operational holdings, nevertheless, have increased over time. Small holdings, below .5 ha., have increased substantially. In contrast, farms between 10-20 ha. have declined, and farms 20 ha. or larger have shifted irregularly yet indicate an overall

---

<sup>147</sup> 1 hectare is approximately 2.47 acres; an operational holding is land used (at least in part) for agricultural production and operated by one unit.

<sup>148</sup> Krishnaraj and Shah, *Women in Agriculture*, 92.

decline.<sup>149</sup> These drops, however, are more indicative of the state of Indian agriculture as a whole, rather than targeted specifically towards women. The data is similar for total farms.

The trends are similar to the United States', with the exception that women as principal operators are growing in all sized farms, even large. There are, of course, more women operators generally in India. For example, there are 13,357,278 female

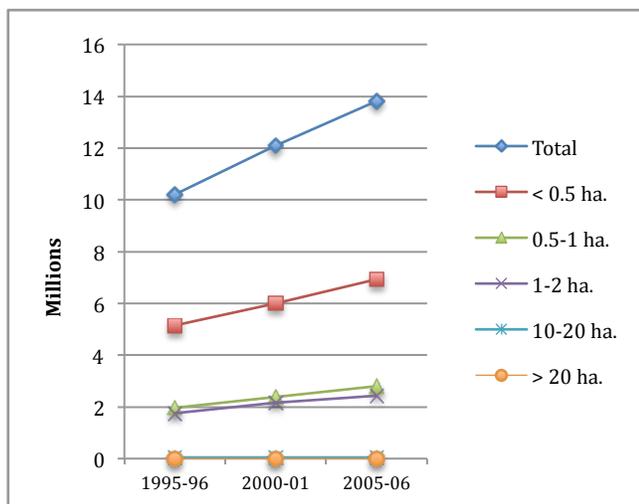


Figure 12 Operational holdings belonging to women. Data taken from Indian Agricultural Censuses.

operators of farms 4 ha. (approx. 9.88 acres) or smaller in India, but only 56,526 women principally operating farms 9 acres or smaller in the United States—far more than the three times population disparity.<sup>150</sup> However, in terms of percentages, Indian women operate 11 percent of operational holdings in India, compared to the 14 percent that women principally operate in the United States. There are of course less farms in America (2,204,792 vs. India's 129,222,237), which accounts for the fewer female operated farms, but the greater percentage.<sup>151</sup> Using the numbers, women in India clearly

<sup>149</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Female Operational Holdings 1995-96, 2000-01, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

<sup>150</sup> United States, *2007 Census of Agriculture*, 54; Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Female Operational Holdings 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

<sup>151</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Female Operational Holdings 1995-96,

exercise their primacy in agricultural production to a great extent. They are slowly gaining more operational holdings and exercising some form of control. Although the gains are uneven throughout size class, women's roles in agriculture as operators cannot be discounted. One factor to take into account, however, is women's growing land rights in the country. While they may have been operating the farm holdings all along, it could be that they are now being counted as operators in India's agricultural census to a greater degree. The urban migration discussed above is also an explanation for the increase, and with it, an emphasis that this increase in operational holdings many not necessarily indicate women's empowerment.

In Madhya Pradesh, the trends for women are unclear. There were 617,986

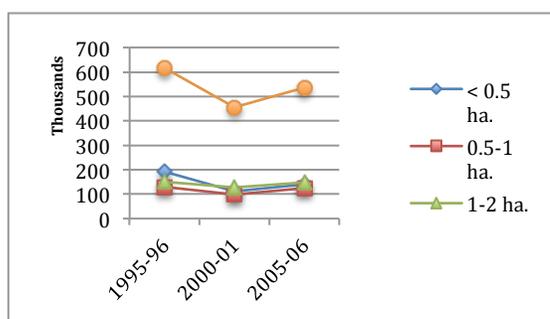


Figure 13 Female Operational Holdings in Madhya Pradesh

female-run operational holdings in 1995-96, 455,809 in 2000-01, and 536,028 in 2005-06. This trend is mirrored in the smaller-scaled holdings, those 5 ha. or smaller. However, in the holdings 5 hectares or larger, there has been a

significant decrease over the 10 year period.<sup>152</sup> This is true for all of Madhya Pradesh. The state is undergoing a series of agricultural changes, which will be discussed in the following

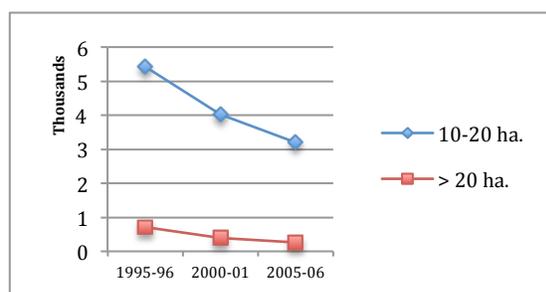


Figure 14 Female Operational Holdings in Madhya Pradesh 10-20 and 20 ha.

2000-01, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>; United States, *2007 Census of Agriculture*, 7;

<sup>152</sup> Ibid.

chapter. The only clear change that can be derived for women as farm operators is the decline in their ownership of large operational holdings, significantly more than women have experienced countrywide.

What can be explained using these statistics? Crop-specific data can be hard to pinpoint, but around the time when soy came to boom in Madhya Pradesh, women's operational holdings declined. They are now growing, once again, during the same period that men in the state are taking part in the mass migration towards the urban regions of Bhopal and Indore, quickly growing to accommodate India's rapid entrance into new manufacturing industries. Once again, I do not argue that these numbers necessarily indicate women's empowerment. However, they do accurately reflect the current status of women in agriculture in Madhya Pradesh. They are gaining more operational holdings. Whether this is the consequence of increased government recognition or because they are feeling more empowered to run farms on their own, women in the largest soy growing state are operating a greater percentage of that land (5.6 percent, up from 4.8 percent in 1995-96).<sup>153</sup>

There are other factors to take into account, however. The labor statistics in the state indicate a decline in women's steady work opportunities. Additionally, it holds the worst hunger statistics in the country. In fact, in a global comparison conducted by the International Food Policy Research Institute, Madhya Pradesh had a global hunger index score of 30.87, ranking it higher than only seven countries in the world: Ethiopia, Liberia, Sierra Leone, Niger, Berundi, Eritrea, and the Democratic Republic of Congo.<sup>154</sup> This

---

<sup>153</sup> Ibid.

<sup>154</sup> Purnima Menon, Anil Deolalikar, and Anjoy Bhaskar, *India State Hunger Index: Comparisons of Hunger Across States* (Washington D.C.: International Food Policy

score is derived from the 23.4 percent prevalence of calorie undernourishment (India's average is 20), 59.8 percent of children under five who are underweight (India's average is 40.2), and the 9.4 deaths per hundred in a child mortality survey (India's average is 7.4).<sup>155</sup>

Despite ranking last in the hunger index, it ranks fifteenth (out of seventeen) in the percent of population below the poverty line (resting at approximately 32).<sup>156</sup> It is also fifteenth in per capita income at approximately 14,000 rupees per year. The state, however, is last in real growth per capita, with its net state per capita growth actually declining.<sup>157</sup> This calculation is most interesting because the percent of growth was calculated between 1999-2000 and 2004-2005, during which Madhya Pradesh's soybean production increased exponentially and became a figure not only nationally, but also in the world market for the soybean trade. Clearly, the state is plagued by extreme inequality despite its financial importance on the world stage. Here, soy is used to pinpoint one specific state and the discouraging statistics that can be found.

### **More on Madhya Pradesh**

Finding state-wise crop data with gender is almost impossible in the United States and India. However, it can be determined that the area used for soy in Madhya Pradesh has increased from 4.32 million ha. in the 2001-02 season to 5.35 in the 2009-10

---

Research Institute, 2009), 19,  
<http://www.ifpri.org/sites/default/files/publications/ishi08.pdf>.

<sup>155</sup> Menon et al., *India State Hunger Index*, 15.

<sup>156</sup> Menon et al., *India State Hunger Index*, 22.

<sup>157</sup> Menon et al., *India State Hunger Index*, 21.

season.<sup>158</sup> This indicates a 24 percent increase in the amount of land used for producing soy in the state and a dedication of approximately one-third of its operated area to the crop. Meanwhile, the all-India increase during those same seasons was from 6.34 million ha. to 9.73, representing a 53 percent increase.<sup>159</sup> Maharashtra's recent growth in soy production accounts for most of the discrepancy.<sup>160</sup> Soy continues to dominate agriculture in India, particularly in Madhya Pradesh, and the numbers so far suggest such a growth will continue. Therefore, when I try to uniquely pinpoint the relationship of women and soy, a near impossibility, I will remain focused on Madhya Pradesh.

In an unpublished master's thesis, Ankit Jaiswal attempted to discover who was growing soy in Madhya Pradesh. He traveled through the state and conducted a sample survey primarily in the Ujjain, Dewas, and Shajapur districts, which grow the most soy in the state, respectively. In his sample, the majority of soybean farms were medium-sized (meaning between 2-4 hectares), with this selection averaging approximately 2.98 ha. When he averaged all soy-growing farms, the area increased to 4.42 ha. Because the large farms were so much larger than the small and medium farms, they affected the overall mean.

Jaiswal also examined labor on the farms. They required an average of 49.13 man-days per hectare (meaning the number of days required by men to crop one hectare), without much difference according to size class. The highest-intensity labor was in harvesting, requiring an average of 11.12 man-days per ha., and the second was hand-weeding with an average of 6.96 man-days per ha. What is most interesting about this

---

<sup>158</sup> Directorate, *Agricultural 2004*, 4.19 (b); Directorate, *Agricultural 2011*, 4.19 (b).

<sup>159</sup> Directorate, *Agricultural 2011*, 4.19 (a).

<sup>160</sup> Directorate, *Agricultural 2004*, 4.19 (b); Directorate, *Agricultural 2011*, 4.19 (b).

data is that for the purposes of this study, “woman labor days [were] converted into man days on the criteria that one woman day equal[ed] to 0.65 man days on the basis of wage rate equivalent.”<sup>161</sup> Obvious feminist issues regarding his choice of classification aside, the most labor-intensive aspects of soy production were harvesting and weeding, commonly considered to be the woman’s job in farming. Using Jaiswal’s technique of counting women’s work-day as producing only a fraction of a man’s, their roles in harvesting the same amount of soy requires more labor than the typically male-dominated aspects of farming such as transportation and marketing. These require a mere average of 4.66 man-days per ha.<sup>162</sup> This is not to say that Jaiswal is correct in assuming that a woman produces less because she is paid less. However, women in India are at a significant disadvantage. The tools used for harvesting and weeding are less advanced, as discussed earlier in the chapter. Additionally, as Jaiswal demonstrated, the tasks themselves require more man-days of work.

The three most prolific soy-growing regions in Madhya Pradesh listed above are located in the Malwa region of Madhya Pradesh.<sup>163</sup> Incidentally, the region also includes the large cities of Bhopal and Indore, which feature large industrial areas and house many of the soy processing and distribution plants in the country. Also interesting is that the three regions mentioned above, Ujjain, Dewas, and Shajapur, feature the largest populations of scheduled castes (SC) (historically oppressed peoples in India). SCs

---

<sup>161</sup> Ankit Jaiswal, “Economics of Production and Value Addition to Soybean in Madhya Pradesh,” (master’s thesis, University of Agricultural Sciences, Dharwad, August 2009), <http://etd.uasd.edu/ft/th9969.pdf>.

<sup>162</sup> Ibid.

<sup>163</sup> Centre for Advanced Research & Development, “Livelihood Zones Analysis: A tool for planning agricultural water management investments: Madhya Pradesh,” in conjunction with FAO 2010, 19, [http://www.fao.org/nr/water/docs/MP\\_LZ\\_analysis.pdf](http://www.fao.org/nr/water/docs/MP_LZ_analysis.pdf).

comprise 24.72, 18.26, and 21.98 percent of the population respectively. This is particularly significant as, according to Vaidyanathan, the “incidence of wage labor tends to be higher in regions with relatively high proportion of scheduled castes which have traditionally been excluded from land ownership.”<sup>164</sup> Consequently, rich landowners occupy much of the rural Malwa region, “with many pockets of poverty, which are inhabited by the SCs.”<sup>165</sup> Those SCs will go on to act as cheap labor in a cash-crop/plantation agricultural system.

This class disparity in the Malwa region is particularly important. Vaidyanathan poignantly addresses this in his book, writing,

Social stratification by caste and religion is far greater in India. Caste-based differentiation in occupations, and in ownership and cultivation of land has long been a distinctive feature of Indian society. Historically, and broadly speaking, the upper castes controlled land, while actual cultivation was carried out largely by lower castes; the lowest rungs of Hindu society—the ‘scheduled castes’—were restricted to the status of laborers with varying degrees of bondage. While this has changed and ownership and cultivation have become widely diffused across castes, the large majority of wage laborers in agriculture continue to be from the lower castes and scheduled castes.<sup>166</sup>

Consequently, it is important to take into consideration the near 25 percent population of SCs in the region producing the largest amount of soy. Meanwhile, 10 percent of the entire district’s rural population is comprised of landless laborers and 30 percent are marginal farmers.<sup>167</sup> Clearly, the region is diverse. However, what I hope to demonstrate are the deep class divisions and the strong presence of such a historically oppressed group. The group acts as wage laborers in a region that financially fuels the country through its agricultural production of cash crops, rather than products that could

---

<sup>164</sup> Vaidyanathan, *Agricultural Growth*, 141.

<sup>165</sup> Centre for Advanced Research, “Livelihood Zones Analysis,” 20.

<sup>166</sup> Vaidyanathan, *Agricultural Growth*, 142-43.

<sup>167</sup> Centre for Advanced Research, “Livelihood Zones Analysis,” 22.

contribute to lessen the terrible hunger statistics of India, and most importantly, the state of Madhya Pradesh.<sup>168</sup>

There are fewer scheduled tribes (ST) in the Malwa region. Although the region itself has a high percentage because of the Dewas district, which has an ST population of 16.45 percent of the total, there are fewer STs in the soy-growing regions. There are 3.11 percent of the total population in Ujjain and 2.74 percent in Shajapur. As members of STs are starting to engage in the national workforce (a new phenomenon), they have begun to affect work opportunities for already present wage laborers. However, because the population of STs is so low in the soy-growing regions, they do not have a significant impact. I want to emphasize here, that despite its high population of SCs and STs, the Malwa region remains one of the most powerful in Madhya Pradesh, housing the capital, electing the largest number of legislators, and growing the most cash crops.<sup>169</sup>

None of these facts indicate the empowerment of women in soy growing regions. Women's participation in the work force is at 39 percent, higher than the state average and one of the highest in the regions. Ujjain has 33.8 percent, Dewas, 36.2, and Shajapur a shocking 42.01. However, as discussed earlier, workforce participation does not necessarily translate to women's liberation from patriarchal holds. 62 percent of girls in the region marry before 18 (as high as 83.7 percent in Shajapur), practically stamping their participation in agriculture as a "foregone conclusion."<sup>170</sup> Additionally, the female literacy rate in the region is a shocking 24.63 percent compared to the nation's female

---

<sup>168</sup> Madhya Pradesh has the worst hunger statistics in the country.

<sup>169</sup> Centre for Advanced Research, "Livelihood Zones Analysis," 10.

<sup>170</sup> Centre for Advanced Research, "Livelihood Zones Analysis," 20.

literacy rate of 65.46 percent.<sup>171</sup> Clearly, despite the zone's engagement in cash crops and overall importance to the state, gender inequality is prevalent.

### **What does this mean for women in Indian agriculture?**

Women as agricultural laborers continue to increase, most often as casual laborers and decreasingly as operators of small, subsistence farms. Despite the overall increase Krishnaraj and Shah brilliantly summarize,

What is significant is that such increase in labor [in agriculture] has often gone in favor of female workers. This seems to have happened primarily because of several factors such as: decrease in the size of operational holdings; changes in cropping pattern towards crops like paddy, cotton, vegetables, where women have usually had a higher share in employment; withdrawal of children from agriculture; increasing male migration etc.<sup>172</sup>

However, the authors warn to be wary of seeing these increased labor opportunities and the male migration as evidence of female empowerment. The labor opportunities have been casual, meaning they are irregular, low-paid, and without benefits. In a field where labor demand is so volatile, being a casual laborer can mean going months without pay.

The debate over how women have been affected by changes in agriculture, as symbolized by soy, encounters many sociological issues from control of natural resources to class-based struggles. Krishnaraj and Shah most acutely demonstrate the ways in which women's new opportunities and struggles in the changing field of agricultural production develop in myriad ways. They write,

---

<sup>171</sup> Ibid.; Office of the Registrar General and Census Commissioner, India, *Census of India, 2011: Provisional Population Totals*, 00-001-2011-Cen-Book (E), New Delhi: Office of Registrar General, 2011, 102, [http://www.censusindia.gov.in/2011-prov-results/prov\\_results\\_paper1\\_india.html](http://www.censusindia.gov.in/2011-prov-results/prov_results_paper1_india.html).

<sup>172</sup> Krishnaraj and Shah, *Women in Agriculture*, 63.

Thus, women's expanding role in agriculture does provide a useful starting point but the role has to be qualified by questions of work quality, class variation in double burden, and whether productive labor works as a sufficient or even necessary condition for autonomy and voice. The issue of effective access as well as control over resources, therefore, becomes an important concern while discussing the actual enhancement of women's role in agriculture.<sup>173</sup>

There is no single way to explore how women as a whole are affected. Much like a comparison of women in U.S. agriculture and women in Indian agriculture must be approached in different ways, so too does an analysis of women in India alone. I have attempted to focus most on rural women, narrowing in on Madhya Pradesh and the regions in the state that grow the most soy. However, even within these groupings, questions of how class, work-quality, natural resource control, and food security factor into the analysis remain.

Studying soy cannot specifically explain all of the changes addressed above, but it can provide a means through which to enumerate them and the consequent effects on women. As Sachs explains, women throughout the world "rarely organize their lives around one particular crop; instead they engage in multiple productive and reproductive activities."<sup>174</sup> However, "with expanding commercialization and capitalization of agriculture, use of land and labor for men's cash-crop production takes precedence over women's [more traditional] cropping systems."<sup>175</sup> Soy represents this commercialization and capitalization, as its entire existence in India was based upon this agricultural change. Sachs summarizes women's roles and the changes already highlighted earlier, but notes the change specifically highlighted by soy.

---

<sup>173</sup> Krishnaraj and Shah, *Women in Agriculture*, 92.

<sup>174</sup> Sachs, *Gendered Fields*, 73.

<sup>175</sup> Sachs, *Gendered Fields*, 69.

Women have undoubtedly been marginalized by the changes in Indian agriculture, symbolized by soy. I do not attempt to reduce every circumstance for women in agriculture in India to a specific consequence of soy. Not only would this be impossible to determine, but it would also discount the many political, economic, and historical circumstances that have led to the current state of women in India and women in the country's agriculture. The history of patriarchal systems, of agricultural changes before, during, and after colonialism, of centuries of foreign trade and interference in crop production have predated the introduction of soy, but are all undoubtedly major contributing factors to the current state of women in Indian agriculture. This thesis does not attempt to address the full historical events leading to this state or to the introduction of soy in India, but they are important to acknowledge and also make the situation incredibly complex.

## 5. From the Farm to the Table, Or At Least to the Elevators: The State of Agriculture in India and the United States

### Indian Agriculture

The entire agricultural system in India has shifted. While its land use has remained relatively the same over time, its contribution to the country's gross domestic product (GDP) has dramatically shifted.<sup>176</sup> In 1960, agriculture accounted for 43 percent of India's GDP and in 2010, 19 percent.<sup>177</sup> However, these statistics do not necessarily imply a shift in agriculture's dominance in India—63 percent of India's working rural men and 79 percent of India's rural workingwomen are employed in the agricultural sector.<sup>178</sup> Rather, the percent share of GDP decrease more accurately indicates growth in India's other sectors through industrialization.<sup>179</sup> This includes food processing, “which is one of the largest [industries] in terms of production, consumption, export, and growth.”<sup>180</sup> It also explains the growing male migration to urban areas, which has increased strain on rural Indian women, and the decrease in size of average operational holdings characterizing India's present agricultural state.<sup>181</sup>

Agriculture in India has changed almost completely over the last fifty years as a result of extreme public and private intervention including commercialization,

---

<sup>176</sup> Directorate, *Agricultural 2011*, 7.3.

<sup>177</sup> World Bank, World DataBank (India, Agriculture % of GDP), <http://databank.worldbank.org/>.

<sup>178</sup> National Sample, *India*, 17.

<sup>179</sup> Vaidyanathan, *Agricultural Growth*, 145.

<sup>180</sup> Prakash M. Shinghi and D.S. Parmar, “Processed Food Marketing in India: Selective Case

Studies,” in Jharwal et al., *Glimpses of Indian Agriculture*, 2: 886.

<sup>181</sup> Harathi and Nanada, *Women Participation*, 57 and 64; Krishnaraj and Shah, *Women*, 63 and 92.

industrialization, and liberalization (both through international trade and domestic policies). In *Agricultural Growth in India: Role of Technology, Incentives, and*

*Institutions*, author A. Vaidyanathan summarized the present state of Indian agriculture:

A relatively low land-man ratio, unequal distribution of land ownership, a high degree of subdivision and fragmentation of holdings, predominance of small farms operating mostly by owner cultivators, the limited role of tenancy, and high dependence of wage labor for agricultural operations are among the distinguishing characteristics of the Indian agrarian economy.<sup>182</sup>

Several aspects of India's economy and agricultural systems have contributed to these features, and they have had subsequently diverse consequences. Most important to note is the new division of land holdings, which implicates more extreme socio-economic divisions and the inherent advantage held by agribusinesses.

Population growth caused land-man ratio to drop, which subsequently led to a "subdivision" of holdings.<sup>183</sup> The population in India has grown from 439.2 million in 1960 to 1.03 billion in 2001 and 1.21 billion in 2011. The agricultural population also increased from

131.1 million in 1960 to 234.1 million in 2001.<sup>184</sup> While this demonstrates an increase in overall agricultural population, as a percentage of the entire population there has actually been a 7 percent decrease. However,

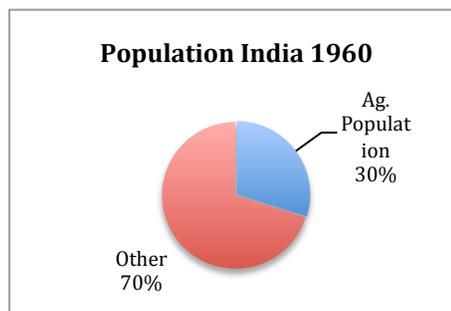


Figure 15 Data from Agricultural Statistics

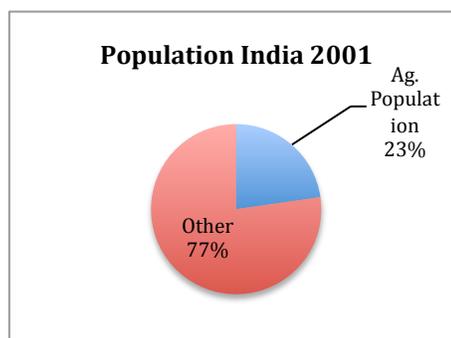


Figure 16 Data from Agricultural Statistics

<sup>182</sup> Vaidyanathan, *Agricultural Growth*, 140.

<sup>183</sup> Krishnaraj, "Food Security," 5385.

<sup>184</sup> The results from 2011 are not yet available; Directorate, *Agricultural 2011*, 2.3 (a).

the agricultural population has nevertheless increased while the area of land used for agriculture has remained relatively the same. For example, in the 1995-96 agricultural census, 163,354,880 hectares of land were used for 115,579,557 operational holdings. In 2005-06 census 158,322,983 hectares made up 129,222,237 holdings.<sup>185</sup> Consequently, subdivision of operational holdings has occurred, and the average size has steadily declined from 2.28 ha in 1970-71, to 1.23 ha in 2005-06.<sup>186</sup> Additionally, number and area of land used by women- owned operational holdings has also decreased between the 1995-96 and the 2005-06 agricultural censuses (except for operational holdings 10 ha or larger).<sup>187</sup> Essentially, there are more farmers for the same amount of land, which has led to a decrease in overall size of operational holdings and a highly uneven distribution of land ownership.<sup>188</sup>

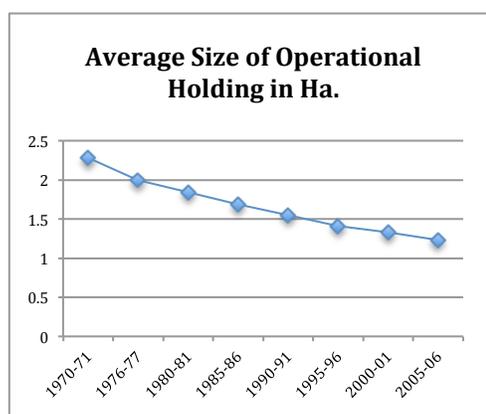


Figure 17 Data Taken From The State of Indian Agriculture.

This uneven distribution is made abundantly clear in India's agricultural census. While the number of individually-run operational holdings 2 ha. or smaller decreased in the ten year period between 1995-96 and 2005-06, the number of individually-run

<sup>185</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Number and Area of Land Operational Holdings 1995-96, 2000-01, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

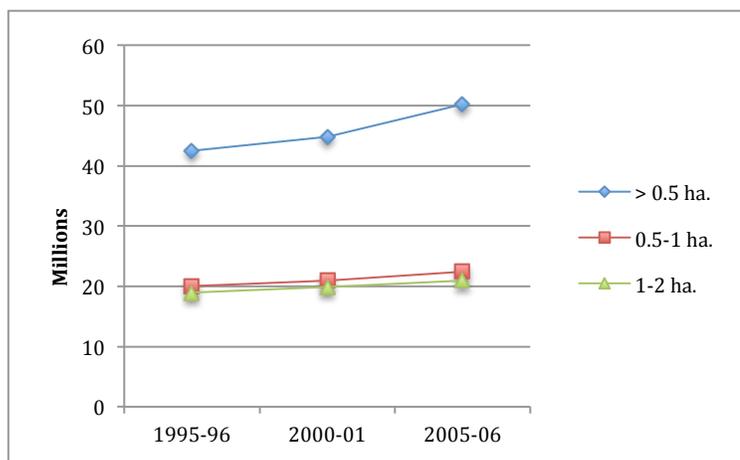
<sup>186</sup> Department of Agriculture and Cooperation, *The State of Indian Agriculture 2011-12*, (New Delhi: Press Information Bureau, Government of India), 2, <http://pib.nic.in/newsite/subpdfdisplay.aspx?docid=96>.

<sup>187</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Female Operational Holdings 1995-96, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

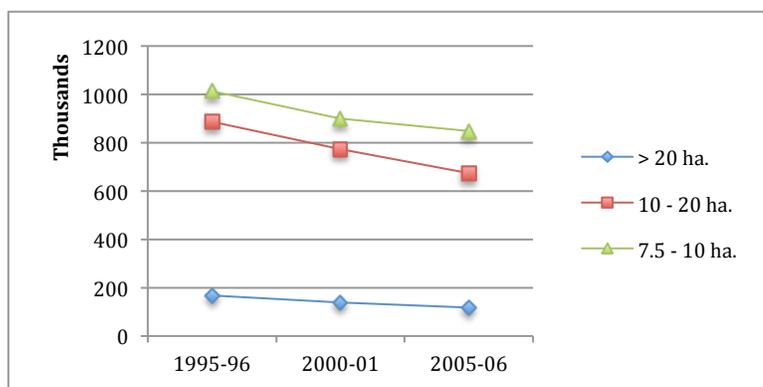
<sup>188</sup> Vaidyanathan, *Agricultural Growth*, 140.

holdings 3 ha. or larger has decreased. The sharpest decreases were in the large farms.<sup>189</sup>

As demonstrated in the graphs, the disparity between marginal and large farms has grown



over the ten years in which the census was taken. There are less individually operated large farms and far more small holdings. This not only leads to increased income disparity in a



country still attempting to recover from a caste-based society, but also, much like in the U.S., puts the majority of farmers in India at a significant

Figures 18 and 19 Individually Run Operational Holdings, All-India, Data taken from Agricultural Census

disadvantage.

The implications of the

decrease in operational holding size extend beyond loss of land. For example, larger operational holdings typically have greater access to irrigation, increasing potential for productivity.<sup>190</sup> Owners of larger farms also have more access to credit and, therefore,

<sup>189</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Number and Area of Land of Operational Holdings 1995-96, 2000-01, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

<sup>190</sup> Vaidyanathan, *Agricultural Growth*, 144.

newer technology such as tractors, which are becoming more popular in India.<sup>191</sup> This puts small farmers at a significant disadvantage in the domestic market from the get go, not to mention when competing on an international scale.<sup>192</sup> A report put out by the Indian Department of Agriculture and Cooperation entitled, “The State of Indian Agriculture: 2011-12,” however, argues that productivity remains relatively the same despite operational holding size.<sup>193</sup> It states:

Fragmentation of operational holdings has widened the base of the agrarian pyramid in most states. Empirical studies have, however, demonstrated that agricultural productivity is size neutral. Factors that determine productivity favorably include among others an easy and reliable access to modern inputs, access to suitable technology tailored for specific needs, the presence of support infrastructure and innovative marketing systems to aggregate and market the output from such small holdings efficiently and effectively. In agricultural technology, the use of high yielding varieties as in the case of Bt cotton and maize, economy in input use, the availability of quality seeds and farming techniques such as system of rice intensification enabled finally by marketing links all have high potential to improve yield.<sup>194</sup>

This analysis presents several flaws. Despite efforts made by the Indian government, small farmers have almost no access to the technologies that the report argues would increase productivity. Therefore, productivity is *not* size neutral. Additionally, the high yielding seed varieties referenced (particularly Bt cotton), have created significant financial turmoil for small farmers and political controversy for India as a whole.<sup>195</sup>

Despite farmer’s suicides, record bankruptcies, and continued food shortages for the poor in India, green revolution convictions continue to dominate agricultural policy in

---

<sup>191</sup> Animals are expensive maintain, especially for small farmers.

<sup>192</sup> Vaidyanathan, *Agricultural Growth*, 157.

<sup>193</sup> This is the first time a report of this nature has ever been published.

<sup>194</sup> Department of Agriculture, *The State*, 3.

<sup>195</sup> For more information read *The Violence of the Green Revolution: Ecological degradation and political conflict in Punjab* and *Farmer’s Suicides in India* by Vandana Shiva and *Stuffed and Starved* by Raj Patel (see bibliography).

India. Just as with soy, this necessarily prevents traditional agricultural methods and generations-old knowledge from being utilized and favors those better able to access the expensive tools and seeds needed to produce competitive yields. Inevitably, with the greater advantages in place, larger farms will continue to grow as small farms become smaller and eventually contract out, stop cultivating, or sell the land altogether.

India subsidizes agricultural costs such as transport, fertilizer, electricity, institutional credit, and large-scale irrigation.<sup>196</sup> These components are used in a much smaller degree, if at all, by small farms. Also, as noted earlier, small farms have significantly reduced access to canal irrigation and sufficient electricity.<sup>197</sup> Therefore, small-scale cultivators have less opportunity to take advantage of government subsidies. Soy growers, therefore, must be either large scale or contract farmers in order to compete in a market where heavily subsidized U.S. soy determines global prices.

In *Crops and Cultivation*, R.S. Deshpande, M.J. Bhende, P. Thippaiah, and M. Vivkenanda note the consolidation of oilseeds into medium and large size operational holdings. They credit this to the Indian government's Technology Mission on Oilseeds and Pulses, which attempted to boost the growth of both types of crops. They write,

Oilseeds gained substantially during the decade of 80s among all the size classes but mainly the gain was consolidated by medium and large size classes of holdings. This was mainly due to TMOP and through expansion of area. As a result, the production increased. The participation in the program was largely by medium and large size of holdings.<sup>198</sup>

---

<sup>196</sup> Vaidyanathan, *Agricultural Growth*, 130; Vandana Shiva, *Globalization's New Wars* (New Delhi: Women Unlimited, 2005), 17-18.

<sup>197</sup> Vaidyanathan, *Agricultural Growth*, 144 and 157.

<sup>198</sup> R.S. Deshpande, M.J. Bhende, P. Thippaiah, and M. Vivkenanda, *Crops and Cultivation* (New Delhi: Academic Foundation, 2004), 101.

In contrast, the state of Madhya Pradesh (the “Soybean State”) has seen a decrease in operational holdings across the board. Deshpande et al. note the decrease in the trend of oilseed growth under the programs, which may have been a contributing factor.

The number of total operational holdings in the state has decreased from 9,602,592 in the 1995-96 agricultural census to 7,908,997 in the 2005-2006 census. Individually owned operational holdings have decreased from, 9,101,337 to 7,472,578. Female individually owned operational holdings have also decreased from 617,986 to 536,028. There could be many reasons for this shift. There has been a recent tendency towards reverse tenancy, a process through which small and marginal farmers lease out land to larger cultivators who have the tools for greater productivity. This leads to a greater proportion of former agricultural households no longer cultivating their land and “a greater concentration of operational holdings.”<sup>199</sup> There has also been a greater demand for wage labor rather than subsistence farming.<sup>200</sup> In a state that is dominated by a commercial, cash crop, this can be expected. Many agribusinesses and soy processing plants are headquartered in Madhya Pradesh, which may have absorbed the farmers who could no longer compete. What can be certain is that agribusiness and commercialization now characterize Indian agriculture and have fundamentally changed food production in the country from small-scale to industrial.

This commercialization, however, has widespread effects, particularly on women. As Maithreyi Krishnaraj explains in her article, when formerly communal lands are privatized, and women’s ownership is thereby usurped, their rights to production and to

---

<sup>199</sup> Vaidyanathan, *Agricultural Growth*, 151.

<sup>200</sup> Harathi and Nanada, *Women Participation*, 64.

resources come into question.<sup>201</sup> Philip McMichael furthers the sentiment in *Development and Social Change* when he remarks, “Women’s lack of security and rights in land means that commercialization easily erodes women’s role in and control of food production.”<sup>202</sup> When women produce 65 percent of the food in Asia, their roles as producers should be prioritized, rather than devalued by the commercialization and commodification that has characterized the global agrarian change.<sup>203</sup> As such the prevalence of growing agribusiness, institutional holdings rather than family-run, commercialized farming rather than subsistence, all acutely affect women in ways that are rarely recognized.

Further indicating India’s agricultural change, the number of large institutional operational holdings has grown considerably.<sup>204</sup> For example, in the last Indian agricultural census, institutions (rather than individuals) held 17.6 percent of the land used by operational holdings sized 20 ha. or more totaling 12,097 farms. In 1995-96, institutions held 11.38 percent of that same land in 9,641 farms.<sup>205</sup> Numbers such as these have been a consequence of several public and private interventions. In 2002, India instituted budgetary changes in response to the “great success of the Green

---

<sup>201</sup> Krishnaraj, “Food Security, 5377.

<sup>202</sup> Philip McMichael, *Development and Social Change: A Global Perspective*, (Thousand Oaks, CA: Pine Forge, 2000), 108.

<sup>203</sup> Ibid.

<sup>204</sup> The percent of operational holdings 20 ha or larger owned by an institution has grown from 11.38 percent in the 1995-96 agricultural census to 17.6 percent in the 2005-06 census (India, Department, *Agricultural*).

<sup>205</sup> Department of Agriculture and Cooperation, Agriculture Census Division, Agricultural Census Database (All-India Tables, Number and Area of Land of Institutional Operational Holdings 1995-96, 2000-01, 2005-06), <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.

Revolution.”<sup>206</sup> The changes, which removed restrictions on the storage and movement of agricultural goods, opened new agricultural export zones, and permitted futures and forward trading in all agricultural commodities, were meant to stimulate competition and the growth of agricultural enterprises.<sup>207</sup> They also followed a long line of budgetary incentives, most notably in the food production sector, which has been highly subsidized in India since 1991.<sup>208</sup> Strong government incentives, such as tax reductions for food producers, are important in the soy sector. The crop typically requires industrial processing before being released on the market in the form of cakes, tofu, and oil. The government aid helps soy producers become more competitive in the global market, but as a consequence, also makes the entire edible oil market more aggressive domestically.<sup>209</sup>

### **India and Agricultural Trade**

Clearly, focus in India has shifted from self-sufficiency to a market economy. This characterizes many other countries in the global South, and is best exemplified through India’s growth of soy. Soy is not indigenous to India, nor can it be processed on a small scale. Instead, an American university, in collaboration with USAID, introduced the crop with the sole intention to grow it with unnaturally high yields and process it only in industrial plants.<sup>210</sup> In doing so, not only did India adopt a new way of food

---

<sup>206</sup> Indian Finance Minister qtd. in Satish Y. Deodhar and Vijay Intodia, “Food Quality Management in Agro Enterprises,” in Jharwal et al., *Glimpses of Indian Agriculture*, 2:899.

<sup>207</sup> Ibid.

<sup>208</sup> Shinghi and Parmar, “Processed Food,” 2:886-87.

<sup>209</sup> Shinghi and Parmar, “Processed Food,” 2:887.

<sup>210</sup> Singh, “Success of the Soybean,” 47-49.

production, but it also opened itself up to the global edible oil market, the effects of which would not be understood until India joined the World Trade Organization and signed the Agreement on Agriculture.

India began to liberalize its oilseed market in the early 1990s, and solidified its new policies in 1994 when it signed the Uruguay Round Agreement on Agriculture (AoA). Until that point, the country had steeply regulated the edible oil industry through “stringent licensing provisions” and “restrictions on exports and imports.”<sup>211</sup> However, when India opened the industry to the world market, which has been tampered by uneven subsidization and dominated by speculation, small farmers suffered. The AoA encourages importation, which is not inherently bad. Importation brings with it more food. It also allows exports, which can help a country’s economy and even its agricultural sectors. However, importation encourages crop specialization, which is not necessarily beneficial for a country with high food insecurity levels. Instead, monocultures dominate agriculture, and countries lose the ability to be self-sufficient and must import foreign products to feed their citizens. This also means bringing foreign agricultural products and prices to compete with domestic agriculture. Foreign crops (such as soy) flood the market, and make domestic products (such as mustard) obsolete. Cheap foreign goods (subsidized below the price of production) compete with national products at prices rural farmers cannot match. This is especially true in the edible oilseed market.

Throughout the 1990s, the edible oilseed market featured a shift in import demand from countries in the global North to countries in the South, India included—as discussed

---

<sup>211</sup> Sharma et al., “Oilseeds,” 162.

previously. With the AoA in place, distortions in the world market were supposed to have been eliminated, allowing India to import what it needed without putting its own farmers at a disadvantage. However, many of the main oilseed producers in the world kept their subsidies and continued to utilize the free trade rules. As Sharma et al. write, “For example, the EU, a net importer of oilseeds and products, and the US, a major exporter, have the most substantial domestic support programs of all oilseed-producing countries.”<sup>212</sup> This meant that the oilseed producers in India would have to compete at internationally subsidized prices, which meant that “for poor oilseeds producers...this [had] definite socioeconomic and socio-political consequences.”<sup>213</sup> The U.S. soy industry is one of the most highly subsidized markets in the world, and Indian soy farmers have to compete with it. While today, most of the soy grown in India is used domestically, the prices still need to match those of the U.S. because of the commodities exchange. India does subsidize its agriculture, but much like in the U.S., these subsidies favor large agribusinesses rather than small farmers through loans, investment in irrigation, transportation aid, and other costs unique to larger businesses.

---

<sup>212</sup> Sharma, et al., “Oilseeds,” 167.

<sup>213</sup> Ibid.

## Agriculture in the United States

There are many similarities between the agricultural changes occurring in the

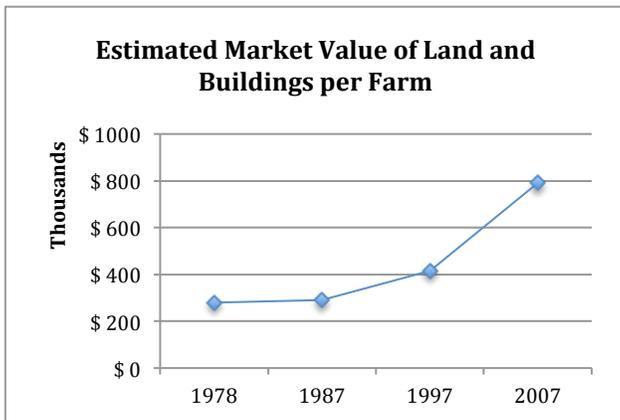


Figure 20 Data taken from U.S. 2007 Census of Agriculture

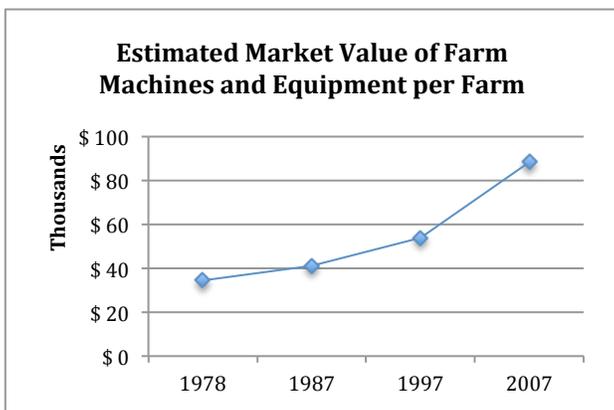


Figure 21 Data taken from U.S. 2007 Census of Agriculture

has decreased since 1978, as has the land in farms. Meanwhile, the estimated market value of land and buildings per farm and the estimated market value of farm

United States and India. Like India, the U.S. “has tended to polarize into two segments: very large operations and very small, often part-time farms.”<sup>214</sup> For example, there were 151,233 farms less than ten acres in

1978 and 232,849 in 2007 (a 54 percent increase). There were also 63,301 farms 2,000 acres or greater in 1978 and 80,393 in 2007 (a 27 percent increase). All other farm sizes decreased except for farms between 10 and 49 acres. Unlike India, the number of farms in America

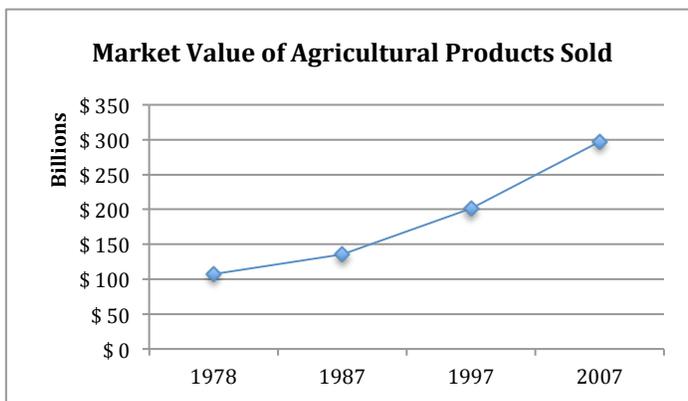


Figure 22 Data taken from U.S. 2007 Census of Agriculture

<sup>214</sup> Rosenfeld, *Farm Women*, 15.

machine on equipment on farms has increased three times what it was in 1978.<sup>215</sup> This is to be expected as “farming in the United States has become more productive, concentrated, centralized, and dependent on hired rather than family labor, with corporate farms accounting for an increasing part of farm production.”<sup>216</sup> Farms are running more efficiently and utilizing more mechanized processes. Often, the growth of commercial crops eliminates the use of fallow periods—as with India’s introduction of soy.<sup>217</sup> Additionally, advances in biotechnology have allowed crops to be grown for greater parts of the year with significantly greater yields.

At the same time this is happening, there are fewer buyers and larger product markets, which span the nation and often the world, rather than formerly

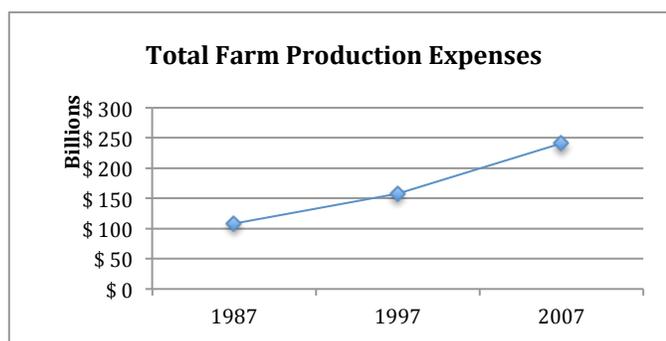


Figure 23 Data taken from U.S. 2007 Census of Agriculture

locally oriented markets.<sup>218</sup> Additionally, vertical integration has become standard in most areas of food production in the United States, meaning the company has control over every aspect of production from the farm to the grocery store. A case study on the pinnacle of agricultural vertical integration, Cargill, will be at the end of the chapter, but I will briefly review the viewpoints. Mary Clare Ahearn, Penni Korb, and David Banker posit in their article, “Industrialization and Contract in U.S. Agriculture,” that vertical integration allows for “more specific demands of consumers requiring a tighter supply

<sup>215</sup> United States, *2007 Census of Agriculture*, 7.

<sup>216</sup> Rosenfeld, *Farm Women*, 12.

<sup>217</sup> Sachs, *Gendered Fields*, 67.

<sup>218</sup> Rosenfeld, *Farm Women*, 18.

chain to adequately respond.”<sup>219</sup> Peter J. Barry also addresses this in his analysis of vertical integration in “Industrialization of U.S. Agriculture: Policy, Research, and Education Needs.” He claims that such integration, which tightens the supply chain, makes the US more competitive in the open market—even allowing domestic firms to contract outside of the country.<sup>220</sup>

However, unlike Ahearn, Korb, and Banker, Barry views the dominance of vertically integrated companies as a result of a reverse demand. He claims that the large food manufacturing conglomerates influence consumer demands, and then satisfy those demands through the efficient operations they have created through integration. By creating “fewer suppliers who provide products with specific attributes,” a cohesive, productive, and efficient food processing operation, can dominate the sector.<sup>221</sup> This, of course, has happened in the case of soy. There are fewer suppliers. Most soy is contracted to larger firms, which will be covered in detail later, and those few firms then market soy throughout the world. Even in the case of India, Barry’s argument comes to life. Those scientists responsible for the institution of soy also created a market for the product in order to increase demand. Barry argues further that the final result of this type of integration “will be a tri-model distribution of production units in agriculture: 1) Industrialized units characterized by contract production and integration; 2) Independent, large-scale family or multi-family units; and 3) Small, part-time farms heavily dependent on non-farm income.”<sup>222</sup> This has come true in every way. Contract production and vertical integration dominate United States agriculture, while the family farm still exists,

---

<sup>219</sup> Ahearn et al., “Industrialization and Contract,” 347.

<sup>220</sup> Barry, “Industrialization,” 129.

<sup>221</sup> Barry, “Industrialization,” 131.

<sup>222</sup> Ibid.

the successful ones are large-scale, and the vast majority of small farms depend heavily on non-farm income.

I do not want to argue in this chapter, as others have, that the family farm in the United States has disappeared. In fact, 97.7 percent of farms in America were classified as family-run in 2007. While there has been a decrease over time, it is not as significant as most believe. The noteworthy change has been in the types of family farms that now produce food in the United States. Small family farms made up 88.4 percent of the total farms in the U.S. in 2007, but they only produced 16.4 percent of the total agricultural product. Conversely, large-scale family farms only accounted for 9.8 percent of the total farms in 2007, but they produced 65.9 percent of the agricultural product. Clearly, the family farm is still very much a presence in the United States and altogether produces 82.3 percent of the food. However, the farms that produce most of the food are now larger (annual sales of \$250,000 or more) and engaged in high yielding, mechanized, and less sustainable production.<sup>223</sup> This, of course enables, more access to government aid, which then leads to more capital to purchase machinery, high-tech seeds, and other agricultural technologies. These then allow the farm produce more food in less time and keep profits high.

This is where the disconnect in popular culture has occurred. Many in the United States believe there has been a decline in the family farm. Clearly, this is not the case. However, what has happened is that the nature of farming in America itself, or at least the popular image of it, has changed. The idea of a white man, working from dawn to dusk,

---

<sup>223</sup> United States Department of Agriculture, Economic Research Service, *Structure and Finances of U.S. Farms: Family Farm Report, 2010 Edition*, by Robert A. Hoppe and David E. Banker, EIB-66 (Washington D.C., U.S. Dept. of Agr., Econ. Res. Serv., July 2010), iv-v, [http://www.ers.usda.gov/media/184479/eib66\\_1\\_.pdf](http://www.ers.usda.gov/media/184479/eib66_1_.pdf).

producing food for his family plus enough to sell for the profits he needs, comprising the bulk of agricultural production in America is no longer the case. I question whether this ever was. As I briefly mentioned in Chapter 1, agricultural systems in the United States have always been cash-oriented. The entire reasoning behind the colonization of America was to produce goods to export to Europe.

The idea was never to create the small farming culture that many picture it to have been. While this does, in many ways, characterize what was the Midwest, this was not the intention for the settlers of America. Du Bois, Mintz, and Tan illustrate in their introduction, “From the sugar plantations of the seventeenth century to the wheat farms of the twentieth century, capitalistic New World farms have of course always been oriented to the sale of their products, and since the beginning most of it has been aimed overseas.”<sup>224</sup> The plantation system unquestionably characterized early America, as it does today in the Midwest. While many families have certainly struggled, having to take off-farm jobs or moving to big cities and allowing larger farms to grow, the argument cannot be made that the entire agricultural system in America has changed. What is different, however, is the growth of corporate farming.

The definition of family farms in the U.S. has changed over time, so it would not be accurate to compare the growth of corporate farming to family farming as demonstrated in the agricultural census. Today a family farm is defined as being majority owned by an operator and his/her relatives by blood or marriage. For the 2007 census, it was defined more accurately by how the farm had been financially

---

<sup>224</sup> Mintz, et al., “Introduction,” 3-4.

organized.<sup>225</sup> This is not an issue when examining corporate farms. Since 1976, the number of corporate farms has nearly doubled from 50,231 to 96,074 in 2007.<sup>226</sup> Meanwhile, as addressed earlier, the land in farms in the United States has decreased during that time. Consequently, there are more corporate farms for less land. Currently, the 96,074 farms classified as “corporate” operate 125,319,810 acres of land, creating an average of approximately 1,300 acres per farm. At the same time, 1,906,355 farms classified as “family or individual” operate 574,150,050 acres of land, making an average of about 300 acres per farm.<sup>227</sup> Clearly, there is a strong argument behind the idea that corporate farming is growing to the detriment of family farms. Some authors have even argued that the corporate control has harmed rural communities as well.

Thomas Lyson and Rick Welsh have illustrated the positive correlations between corporate-control and poverty levels.<sup>228</sup> Their results do not prove that large-scale agriculture, in particular, increases poverty, but they do show that poverty levels in states with anti-corporate farming laws are low in farming-dependent counties in comparison to farming-dependent counties in states without anti-corporate farming laws. Large-scale farming alone, however, failed to prove these statistics.<sup>229</sup> Therefore, the authors could only conclusively determine that corporate-controlled agriculture negatively affects people in rural farming-dependent areas. However, this is a significant discovery. As they claim, “The ten largest US-based multi-national corporations control almost 60

---

<sup>225</sup> United States, *Structure and Finances of U.S. Farms*, 2.

<sup>226</sup> United States, *2007 Census of Agriculture*, 7.

<sup>227</sup> United States, *2007 Census of Agriculture*, 80.

<sup>228</sup> Thomas A. Lyson and Rick Welsh, "Agricultural Industrialization, Anticorporate Farming Laws, and Rural Community Welfare," *Environment and Planning A* 37.8 (2005): 1489, doi:10.1068/a37142.

<sup>229</sup> Lyson and Welsh, “Agricultural Industrialization,” 1488.

percent of the food and beverages sold in the United States.”<sup>230</sup> Additionally, while there were only 1,075 non-family corporations with more than ten stockholders in 2002, they had sales of over \$5 million per year. Family-owned farms, in contrast, averaged \$670,000 per year.<sup>231</sup> Further, nearly half of all agricultural products were produced that year by only 1.6 percent of farms, and 90 percent of agricultural products were produced by 15 percent of the farms.<sup>232</sup>

None of this is surprising and has already been reviewed. There is unquestionably a significant “concentration of production on a decreasing number of farms,” which has an overall negative effect on rural agriculture-dependent populations.<sup>233</sup> One aspect, however, that needs to be addressed is that corporate-owned farms do not truly represent the corporate control of agriculture in the United States. Contract farming is a growing trend, and is the means through which most large corporations in the United States procure food for processing and sale.

### **Contract Farming**

Ahearn et al. explain in their evaluation of vertical integration, the smaller supply chain allows for consumer demand to be met. A USDA review reiterated those same sentiments

Agricultural contracts can lead to improvements in efficiency throughout the supply chain for products by providing farmers with incentives to deliver products

---

<sup>230</sup> Lyson and Welsh, “Agricultural Industrialization,” 1480.

<sup>231</sup> Ibid.

<sup>232</sup> Ahearn, et al., “Industrialization and Contract,” 361.

<sup>233</sup> Ahearn, et al., “Industrialization and Contract,” 347.

that consumers want and to produce products in ways that reduce processing costs and, ultimately, retail prices.<sup>234</sup>

In this way, corporations can dictate what products will be grown and how. They can ensure quality and congruence without having to actually operate the farms themselves. This becomes an extraordinarily efficient way to procure agricultural products for large-scale production, but also keeps the production itself officially in the hands of family farmers.

In contract farming, a non-farm business will contract a farm to grow certain crops in either a marketing or production contract. “The [marketing] contract sets a price (or a pricing formula), product quantities and qualities, and a delivery schedule. Contractor involvement in production is minimal, and the farmer provides all the inputs.”<sup>235</sup> The contract is finalized before the harvest or before the livestock is ready to be marketed. The production contract, in contrast, gives the contractor ownership of the commodity during production and pays the farmer a fee in return. The contractor takes financial responsibility for most the inputs as well.<sup>236</sup> In most marketing contract cases, as Rosenfeld explains, the non-farm company will set “the price to be paid for the commodity. [Meanwhile,] the farmer continues to bear most of the risk associated with a crop or other failure.”<sup>237</sup> If the farmer’s production ends up being lower than the agreed upon amount, s/he would have to make up the difference with spot-purchases, which are significantly more expensive than the cost the farmer would have paid, decreasing the

---

<sup>234</sup> United States Department of Agriculture, Economic Research Service, *Agricultural Contracting Update: Contracts in 2008*, by James M. MacDonald and Penni Korb, EIB-72 (Washington D.C.: U.S. Dept. of Agr., Econ. Res. Serv., Feb. 2011), 5, <http://www.ers.usda.gov/media/104365/eib72.pdf>.

<sup>235</sup> United States, *Structure and Finances of U.S. Farms*, 39.

<sup>236</sup> Ibid.

<sup>237</sup> Rosenfeld, *Farm Women*, 16.

overall profit. Additionally, should the contractor fail to pay, the farmer could receive less from the resulting spot market purchases.<sup>238</sup>

The costs are not all so dire. In many ways farmers can benefit. They can experience a reduction of price risks, as they have been guaranteed a set price even if the predictions have been incorrect and the commodity could sell for a cheaper rate. They can also base their contract on futures market rates if they choose.<sup>239</sup> The farmers also benefit from assured returns on capital investments, alleviation of marketing burdens, and easier access to credit.<sup>240</sup> The greatest advantage is clearly the prospect of a guaranteed buyer. Most large-scale farmers are willing to make many sacrifices to ensure sales at the end of a season.

Unfortunately, these sacrifices can be numerous. The practice of contracting, in most cases, takes the decision-making capabilities away from the family.<sup>241</sup> Non-farming companies, depending on the contract, often dictate how certain agricultural products should be grown in order to ensure product consistency. If the decision-making role for women was low in the family farm already, family farms contracting out implies an even further decreased role for women in farm management. If the family cannot even make its own decisions, the opportunities for women inevitably decrease.<sup>242</sup> One famous situation portrayed in the documentary *Food Inc.* is that of a farmer, Carole Morison, whose contract with Purdue ended because she refused to fully enclose her chicken house. Meanwhile, Tyson farmers were forced to invest so much in high-tech, “efficient”

---

<sup>238</sup> United States, *Agricultural Contracting Update*, 5.

<sup>239</sup> United States, *Agricultural Contracting Update*, 4.

<sup>240</sup> *Ibid.*; Rosenfeld, *Farm Women*, 16.

<sup>241</sup> Rosenfeld, *Farm Women*, 30.

<sup>242</sup> *Ibid.*

facilities in order to maintain their contracts that their profits were extraordinarily low.<sup>243</sup> This does highlight the most contract-dominated industry (broilers), but it could also reliably indicate the case for other contracts as well. If farmers have made capital investments in order to appease their contractors, than they are left with few alternatives when the contract runs out. This is often used as a tactic to lower contract payments.

As vertical integration continues to dominate in agriculture in the United States, contract farming will grow. The USDA report makes sure to clarify between the two, but I find that there is not much difference between procuring the product through contract and growing it within the company. Contracting benefits the non-farming company in ways that owning the farm could not. As the report argues,

But vertical integration makes for a more complex firm, which may be difficult to manage. Farm operators become farm managers in vertically integrated businesses and may not be required to provide the effort or the decision-making that they would in the role of an owner/operator.<sup>244</sup>

In contrast, contracting removes these negative consequences, but still allows for the non-farming company to essentially control the product. There is not much difference between owning the farm and dictating the inputs, methods, and selling price of its crops.

Currently, the plurality of contract farms is classified as “very large” (meaning with sales of \$500,000 or more). 29.1 percent of contract farms are classified as such.<sup>245</sup> Large-scale farms (sales of \$250,000 or more) in general account for 48 percent of total contract farms.<sup>246</sup> A report by the Economic Research Service of the USDA explains, “Because larger farms tend to earn higher returns than smaller farms, production ...

---

<sup>243</sup> *Food Inc.*, directed by Robert Kenner, (Magnolia Home Entertainment, 2009), DVD.

<sup>244</sup> United States, *Agricultural Contracting Update*, 6.

<sup>245</sup> United States, *Structure and Finances of U.S. Farms*, 38.

<sup>246</sup> *Ibid.*

continues to shift to larger operations and to contracts.”<sup>247</sup> Consequently, a larger share of agricultural production is under contract than the share of farmers under contract.<sup>248</sup>

This does mitigate some of the potential consequences highlighted earlier by Rosenfeld for family farmers bearing the risk for failures having made investments to adhere to the stringent demands. However, it also introduces new ones. She asserts,

While market production contracts leave at least the actual production in the hands of the farmer, there is concern that such arrangements favor the larger farmers. Other types of markets for a particular commodity may disappear when contracting is the dominant arrangement. If large farms are better able to get contracts than small ones, then small farmers may find themselves without a market at all for their products.

Contract farming thus becomes one of a series of means through which large farms gain a significantly competitive advantage, and small farms are edged out of the market.

Depending on the crop, agribusiness progresses through contract farming. In other cases, it develops through vertical integration and subsidy advantages. However, in almost every crop, non-farming businesses are increasingly controlling the industry rather than family farms.

Contract farming is a growing feature in Indian agriculture as well. While tenancy does not characterize Indian agriculture (as it does most other agrarian economies), contract farming has become a new method through which agricultural firms can procure raw materials where the market has fallen short.<sup>249</sup> In their analysis of four contract farming case studies, Gurdev Singh and S.R. Asokan write, “Contract farming is emerging as an important tool for agribusiness firms to organize production. Policy

---

<sup>247</sup> United States, *Agricultural Contracting Update*, iv.

<sup>248</sup> Ahearn et al., “Industrialization and Contract,” 355.

<sup>249</sup> Vaidyanathan, *Agricultural Growth*, 141-42; Singh and Asokan, “Contract Farming in India,” 2:143.

makers view it as a means to boost rural income and employment.”<sup>250</sup> The costs and benefits varied among crops, and the authors did not include soy in a case study. In many situations, there was a high net return with assured payment. Additionally, those with short-term crop contracts had relatively flexible obligations and could easily leave once the season ended. Those with long-term contracts, however, had to invest significantly and would face harsh punishments if they found more money elsewhere.<sup>251</sup> In some cases, the contracts were written in English or were lengthy and had confusing clauses. In all cases, the companies retained copies of these contracts, whereas the farmers never did.<sup>252</sup> Because soy was not included, and in most cases, contract farming is not made part of official public surveys, the effect on the soy industry cannot be analyzed. However, it should be considered as a possibility for the crop. Singh referenced contract farming as a means for processors to procure soy in his historical overview. However, in a sample of some large soy processing companies located in Madhya Pradesh, none publicly released where or how they procured the soy originally.

Contract farming does not yet play as big of a role in the soy industry as in broiler and other sectors, but it is a growing trend. The share of soy in total U.S. contract production has increased from 1.7 percent in 2001-02 to 6.4 percent in 2008, with livestock products accounting for the largest share.<sup>253</sup> The share of soy under contract in the United States has also increased from 9.4 percent to 25.1 percent.<sup>254</sup> This is not surprising as the benefits for these farmers are clear. The farms under contract had an

---

<sup>250</sup> Singh and Asokan, “Contract Farming,” 2:143.

<sup>251</sup> Singh and Asokan, “Contract Farming,” 2:146.

<sup>252</sup> Singh and Asokan, “Contract Farming,” 2:147.

<sup>253</sup> United States, *Agricultural Contracting Update*, 12.

<sup>254</sup> United States, *Agricultural Contracting Update*, 13.

average value of production of \$561,264 (\$157,716 of soy) in 2008 while non-contract farms had produced \$335,008 of goods (and \$78,906 of soy). The distribution of these contracts differed over size class as well. The average size for contract farms was 375 harvested acres almost twice non-contract farms' average of 192 harvested acres.<sup>255</sup>

It is also worth noting that most soy producers only contract about half of their crop and that it took approximately 75 acres to meet the average production contract.<sup>256</sup> Additionally, the trend to pursue contracts grew rapidly after a period extreme instability in the market, which persuaded farmers to ensure steady profits at the end of a harvest.<sup>257</sup> This was uniquely beneficial in 2008, as soy farmers received an average of \$0.88 more per bushel of soy than prices received for the crop in a nationwide average. However, these statistics were not steady during the most volatile period for soy sales, 2005 to 2008. During this time, the share of soy farmers in the United States under contract increased from 21.2 percent to 33.9 percent.<sup>258</sup>

Most of these soy contracts are market rather than production. The USDA report predicts similar increases so that the farmer can ensure a market and steady price. The authors explain,

Such contracts are simpler than production contracts and, while they introduce new risks in the form of contract volume commitments, they do not govern the same capital commitment envisioned in livestock production contracts. With fluctuations in prices likely to continue, more producers can be expected to use marketing contracts as a tool for risk management.<sup>259</sup>

This is mostly in response to the volatility of soybean prices, which can be difficult for a farmer alone to confront. There are co-ops for farms to join, but most soy farmers rarely

---

<sup>255</sup> United States, *Agricultural Contracting Update*, 23.

dedicate their entire harvest to a single contract anyway, leaving flexibility for the rest of their product.

### **Global Agribusiness: Cargill**

Cargill, the United States' largest agricultural company, is attempting to reach out to farmers. It entered the soybean industry in 1943 through its acquisition of three processing plants in Iowa and Illinois. It then looked to Tennessee for the storage elevators, where most soy travels even today after purchasing.<sup>260</sup> Recently, Cargill has begun to reach out to Ohio farmers through a joint project with Dupont. According to the company's website,

For the 2013 growing season, Cargill will contract with soybean farmers in the Sidney, Ohio, area to grow Plenish® high oleic soybeans that will be delivered to Cargill's soybean facility for processing (on-farm storage with buyer's call). Growers will be eligible for a processor-paid incentive for producing and delivering high oleic soybeans. Interest in Plenish® high oleic soybean oil from food companies continues to be strong and the 2013 Cargill contract program will support ongoing market development activity.<sup>261</sup>

Nevertheless, in 2007, only 506 farms in the U.S. were under contract growing grains and oilseeds, as compared to the 17,001 raising broilers and other meat-type chickens.<sup>262</sup>

---

<sup>256</sup> United States, *Agricultural Contracting Update*, 23 and 28.

<sup>257</sup> United States, *Agricultural Contracting Update*, 25.

<sup>258</sup> United States, *Agricultural Contracting Update*, 26-27.

<sup>259</sup> United States, *Agricultural Contracting Update*, 28.

<sup>260</sup> "Cargill Timeline, 1865 – present," Cargill, accessed March 1, 2013, <http://www.cargill.com/wcm/groups/public/@ccom/documents/document/doc-cargill-history-timeline.pdf>.

<sup>261</sup> "Dupont Pioneer, Cargill Announce 2013 Plenish® High Oleic Soy IP Contract Program," Cargill, accessed March 1, 2013, <http://www.cargill.com/news/releases/2012/NA3069013.jsp>.

<sup>262</sup> United States, *2007 Census of Agriculture*, 48.

However, Cargill has recently been making more concerted efforts towards contract farming, so it may be safe to predict a growth in the 2012 agricultural census.

This is all part of Cargill's attempt at vertical integration. Cargill operates its own grain elevators, which it uses to store soy purchased through several different types of marketing contracts. The levels of control vary, but it can be safe to assume that many farms opt to utilize Cargill's extensive presence in soy inputs production (e.g. seeds, technologies), financing programs, and insurance agencies. The company has extraordinary dominance in soybean futures trading. It also owns its own processing plants, transportation methods (e.g. cargo ships, shipping facilities) throughout the world, and global distribution offices. In fact, Cargill operates its own transportation division through Cargill ETM, which charters out shipping vessels over all major oceanic routes to a myriad of industries and operates its own ports. Cargill ETM also operates an energy division, which has offers energy products from natural gas to petroleum and coal, and even a metals division to buy, sell, process, and trade metals, which can be used for agricultural technologies. The company also develops and markets human food products globally in addition to its food ingredients division. Located in 65 countries (including Brazil where its processing plant/shipping facility has recently come under intense political controversy) and an annual charter of 150 million metric tons of grains and oilseeds, Cargill has control in every single aspect of the soy industry.

In the animal feed industry (dominated by soy and corn), the company produces the inputs and tools, works with animal producers, and markets the product to food retailers. Through its acquisition of Continental Grain Company in 1998, it opened more markets throughout the world. Continental had already opened the first foreign-owned

feed mill in China in the 1970s and had essentially transformed the industry there.<sup>263</sup> Its operations in the feed industry are also particularly important as poultry and livestock consume 98 percent of U.S. soybean meal. Interestingly, in a recent study conducted by the United Soybean Board through a project called, “Beyond the Elevator,” over one-third of U.S. soy farmers did not know their true end customer. 25 percent believed it to be the storage elevator, used by statewide co-ops or operated by agribusinesses.<sup>264</sup> This represents a shocking disconnect between the farmers and the profitability of their product. It also shows how, even in the United States, with such a dominating agricultural presence in the world, the food producers are still at a disadvantage.

Cargill represents just one of the companies that dominates soy in the United States. Other such as Archer Daniels Midland (ADM), Monsanto, and DuPont cannot be discounted. They are very famous amongst politically minded people in the United States for their somewhat controversial roles in several industries, but unknown to the general public, although many documentaries and Monsanto’s new advertising campaign in Washington D.C. may serve to change that. ADM’s vertical integration more closely resembles Cargill’s than the other companies, which control the more biotechnology-related aspects of the soy industry. It also “opened the world’s largest soy extraction facility in Decatur, Illinois” in 1939, in essence starting what soy production is today.<sup>265</sup> In all cases, however, these companies’ power in soy must be recognized in order to fully

---

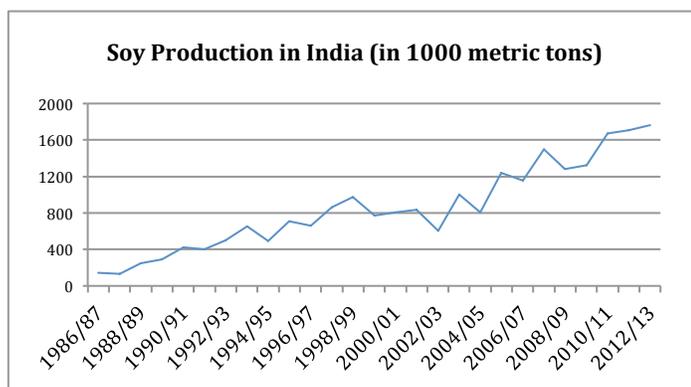
<sup>263</sup> Information taken from Cargill website.

<sup>264</sup> “Beyond the Elevator: Checkoff Urges Farmers to Know Their Leading Customers,” United Soybean Board, accessed March 1, 2013, <http://www.unitedsoybean.org/topics/animal-ag/beyond-the-elevator/>.

<sup>265</sup> Patel, *Stuffed and Starved*, Chapter 7.

understand what soy means in the United States, and even in India, where Cargill's presence has grown significantly.

Twenty-five years after beginning operations in India, Cargill now has investments in every aspect oilseed production in the country. On its website, the company states, "We originate, process, store, trade, and market in a wide range of



agricultural commodities such as grains, oilseeds, sugar, and cotton.”<sup>266</sup> The company has grown significantly in its refining and processing roles of both indigenous and edible oils,

Figure 25 Data taken from USDA FAS database.

an aspect of the market once dominated by women.

Its products in oil refinery include the Sweekar, NatureFresh, and Gemini companies, which sell versions of refined mustard, soybean, sunflower, palm, and imported olive oils. Cargill also produces hydrogenated fats through its companies Sunflower Vanaspati and Rath Vanaspati.

Cargill identifies itself as “one of the largest originators and marketers of food and coarse grains in India,” which is interesting as it is an American company.<sup>267</sup>

Further, India's soy production doubled from 132,000 metric tons to 247,000 one year

<sup>266</sup> “Cargill in India,” Cargill India, accessed March 1, 2013, <http://www.cargill.co.in/en/about/index.jsp>.

<sup>267</sup> “Grains and Oilseeds,” Cargill India, accessed March 1, 2013, <http://www.cargill.co.in/en/products/grain-oilseeds/index.jsp>.

after Cargill's arrival in the country.<sup>268</sup> While the connection cannot be precisely determined, it does follow the trend of soy in India—of American bodies playing astonishingly key roles in the industry. First, it was American Universities and now American corporations. The United States' undeniable presence in the relationship between India and soy reaches its pinnacle with Cargill. It demonstrates the incredible reach of American agri-business and the influence of United States crop production on India.

According to its website, Cargill's soybean ventures source from the domestic market and import and export the crop. Also, in an attempt to “cater to the growing demand of consumers for vegetable protein,” Cargill processes and crushes soybeans “across western and central India”.<sup>269</sup> Interestingly, while it operates an oil/food depot in Indore (a major agricultural-industrial area), all of its oil refinery locations are located near coasts.<sup>270</sup> Consequently, its ETM division has a major presence in the country as Cargill also offers its industrial customers transportation solutions, energy products, and metal. Much like in the United States, the company also deals in animal feed and agricultural financing in the country. As the world's largest private company, as ranked by Forbes, Cargill's power carries over to India and the rest of the world. Its extensive vertical integration allows it to control every aspect of soy's production, from beginning to end, posing questionable consequences for farmers irrespective of location or crop as

---

<sup>268</sup> United States, Foreign Agricultural Service, Production Supply and Distribution Online Database (Soy Production in India).

<sup>269</sup> “Grains and Oilseeds.”

<sup>270</sup> “Locations,” Cargill India, accessed March 1, 2013, <http://www.cargill.co.in/en/locations/index.jsp>.

soy itself (whether as animal feed or soil nutrient) is involved in most agricultural processes in the world.

Cargill's potential for monopolization is already being realized in the soy industry, and as the world is now so dependent on the crop, everyone is at risk, from the farmers to the consumers to government pension funds invested in the commodities market. Cargill can effectively determine global prices of soy, giving poor farmers in any country little option but to accept the privately determined market value. Additionally, given the results of the world's recent financial crisis, the possible failure of the world's largest private company could devastate all of agriculture.

## 6. Conclusion

Soy serves as an excellent example of industrialization, commercialization, and agribusiness growth in both the U.S. and India. Particularly in India, its introduction through the United States provides a dimension of foreign intervention that makes the story even more unique. An American crop replaced traditional food sources and farming systems. It transferred India's small-scale, decentralized oil market, to an agribusiness culture, in which agricultural laborers increase and cultivators decrease. It also opened the country, built on a small-farm culture, to the "soybean futures market" worth billions (to Western investors).<sup>271</sup> It even paved the way for a new system of "e-choupal," which provides Internet access to soy farmers to check prices of soybean commodity futures and determine when to sell.<sup>272</sup> The shift to soy also undermines the traditional knowledge and ecological value of seeds already used in the country. When soybeans replaced mustard seed, as well as other oilseed varieties, it replaced a product of not only health, but also of traditional and spiritual value. Additionally, it replaced the role of women in oil and seed production.

Rural women in India play a vital role in food production. They cultivate seeds through a traditional form of genetic modification using informal breeding and innovation.<sup>273</sup> This has traditionally been women's role, which was undermined by, not only a decrease in traditional oilseed use, but also the introduction of a non-native crop to

---

<sup>271</sup> Shiva, *Stolen*, 27.

<sup>272</sup> Colle, Royal D, "Education, Development, and the E - World: Is Something Missing here?" *Comparative Education Review* 52.2 (2008): 279, doi: 10.1086/529497; Waldman, Amy, "India's Soybean Farmers Join the Global Village," *The New York Times*, January 1, 2004, <http://www.nytimes.com/2004/01/01/world/india-s-soybean-farmers-join-the-global-village.html?pagewanted=all&src=pm>.

<sup>273</sup> Kumari et al., "Globalization," 72-74.

Indian agriculture. This foreign crop took primacy over the seeds that had been cultivated over generations. Soybeans are the second most widely produced oilseed in the country after cotton—most of which is patented by an American corporation and has caused its own host of humanitarian and environmental destruction in the country.<sup>274</sup> Clearly, soy represents the imperialist aspects of world agriculture that I have only been able to touch upon in this work.

While my initial intention was to explore the consequences unique to such an agricultural takeover, I found that the different roles of women in agriculture in the United States and India provided a more fruitful study. I used soy in order to narrow down my level of exploration, yet still attempted to retain the idea that soy is not native to either country. Soy is not grown to feed populations or to maintain global health. If it were, the state in India that grows the most soy would not have the worst hunger statistics in the country. Nor would the region in America that grows the most soy (the Midwest) have its own host of health issues (mainly obesity) caused by poor nutrition.

Soy is produced solely to make money. It must be grown, processed, and sold on a large scale. (Competition in the commodities market makes it necessary to at least join a co-op in order to sell soy in either country.) Women typically do not take part in this type of agriculture. The reasons vary according to country and culture, but the fact is true throughout. Consequently, when agricultural systems refocus to participation in world trade over growing nutritious foods, women are alienated from the process, even more so with a crop that requires large-scale, mechanized processing in order to be used.

---

<sup>274</sup> Deshpande and Parameswarappa, “Evaluation of Oilseed Production,” 63

This work examines several aspects of agricultural systems in the United States and India, using soy as a means through which to narrow the study. It shows how farming systems are becoming increasingly mechanized and industrialized, and the consequent effects on women, which is beautifully illustrated by soy. It demonstrates the ways in which women's roles in agriculture have been undervalued or undermined as a result of agriculture change, negligence in previous sociological inquiries, or lack of statistical knowledge. This can also be explained using soy as one of the many case studies in a review of agriculture in India and the United States. This work also verifies common conceptions on women in farming, agricultural change, and food production systems and attempts to dispel others. This all comes together in order to achieve this work's final purpose, to illustrate the state of women in agriculture in the United States and India using the story soy as a strategic lens.

As explained in the introduction, there are many areas left to explore. I had intended, when first embarking on this work, to include an analysis of health. In the future, I hope to do just that. Food systems are changing globally, and so has health. The lack of access to nutritious food in the United States and India is a gendered issue, and will be my focus for future work. Soy adds a dimension because it makes overly processed, artificial, and generally unhealthy foods available cheaply, while using the resources that could be used for more nutritious foods (whether it be money or farmland). Other areas of study, such as world trade and international relations, also were not included, but provide more gaps to fill at a later date. Now, however, it can be concluded that agricultural systems have changed, for better or worse, and that, inevitably, women have been uniquely (and often negatively) affected. Soy serves as one of just many

examples that demonstrate the devaluation of women's contribution to agriculture, the mechanization and industrialization of food production, and the loss of control over food that women are currently experiencing in both the United States and India.

## Bibliography

- Ahearn, Mary Clare, Penni Korb, and David Banker. "Industrialization and Contract in U.S. Agriculture." *Journal of Agriculture and Applied Economics* 37, no. 2 (Aug. 2005): 347-64.
- Ali, Mohd. Iqbal and G. Bhaskar, eds. *WTO, Globalization, and Indian Agriculture*. New Delhi: New Century Publications, 2011.
- Bagchi, Deipica. "Women in Agrarian Transition in India: Impact of Development." *Geografiska Annaler. Series B, Human Geography* 63, no. 2 (1981): 109-17.
- Barry, Peter J. "Industrialization Of U.S. Agriculture: Policy, Research, And Education Needs." *Agricultural and Resource Economics Review* 24 (April 1995): 128-135. <http://purl.umn.edu/31463>.
- "Beyond the Elevator: Checkoff Urges Farmers to Know Their Leading Customers." United Soybean Board. Accessed March 1, 2013. <http://www.unitedsoybean.org/topics/animal-ag/beyond-the-elevator/>.
- Bock, Bettina B. "Introduction: Rural Gender Studies in North and South." In *Rural Gender Relations: Issues and Case Studies*, edited by Bettina B. Bock and Sally Shortall, 1-18. Oxfordshire, UK: CABI Publishing, 2006.
- Bureau of Labor Statistics ("Household Data, Annual Average: Current Population Survey: 2. Employment status of the civilian non-institutional population 16 years and over by sex, 1972 to date," Labor Force Statistics from the Current Population Survey, accessed February 16, 2013), <http://www.bls.gov/cps/cpsaat02.pdf>.
- ("Household Data, Annual Averages: 15. Employed persons in agriculture and related and in nonagricultural industries by age, sex, and class of worker," Labor Force Statistics from the Current Population Survey, accessed February 16, 2013). <http://ftp.bls.gov/pub/special.requests/lf/aa2003/pdf/cpsaat15.pdf>.
- ("Household Data, Not Seasonally Adjusted: A-22 Employed persons in agriculture and nonagricultural industries by age, sex, and class of worker," Labor Force Statistics from the Current Population Survey, accessed February 16, 2013). <http://www.bls.gov/web/empstat/cpseea22.pdf>.
- "Cargill in India." Cargill India. Accessed March 1, 2013. <http://www.cargill.co.in/en/about/index.jsp>.
- "Cargill Timeline, 1865 – present." Cargill. Accessed March 1, 2013. <http://www.cargill.com/wcm/groups/public/@ccom/documents/document/doc-cargill-historytimeline.pdf>.

- Centre for Advanced Research & Development, "Livelihood Zones Analysis: A tool for planning agricultural water management investments: Madhya Pradesh," in conjunction with FAO 2010.  
[http://www.fao.org/nr/water/docs/MP\\_LZ\\_analysis.pdf](http://www.fao.org/nr/water/docs/MP_LZ_analysis.pdf).
- Colle, Royal D. "Education, Development, and the E - World: Is Something Missing here?" *Comparative Education Review* 52.2 (2008): 275-280. doi: 10.1086/529497.
- Deodhar, Satish Y. and Vijay Intodia. "Food Quality Management in Agro Enterprises." In Jharwal et al., *Glimpses of Indian Agriculture: Macro and Micro Aspects*, 2: 899-906.
- Department of Agriculture and Cooperation. Agriculture Census Division. Agricultural Census Database (All-India Tables, Female Operational Holdings, 1995-96, 2000-01, 2005-06). <http://agcensus.dacnet.nic.in/nationalholdingtype.aspx>.
- Department of Agriculture and Cooperation. *The State of Indian Agriculture 2011-12*. New Delhi: India, Press Information Bureau, Government of India.  
<http://pib.nic.in/newsite/subpdfdisplay.aspx?docid=96>.
- Deshpande, R.S. and K.J. Parameswarappa. "Evaluation of Oilseed Production Program in Karnataka: State Sector and District Sector Schemes." In Jharwal et al., *Glimpses of Indian Agriculture: Macro and Micro Aspects*, 2: 63-88.
- Deshpande, R.S., M.J. Bhende, P. Thippaiah, and M. Vivkenanda, *Crops and Cultivation*. New Delhi: Academic Foundation, 2004.
- Directorate of Economics and Statistics. Department of Agriculture and Cooperation. Ministry of Agriculture. Government of India. *Agricultural Statistics At a Glance 2004*. New Delhi: India. Directorate of Economics and Statistics, 2004.  
[http://eands.dacnet.nic.in/Previous\\_AT\\_Glance\\_2004.htm](http://eands.dacnet.nic.in/Previous_AT_Glance_2004.htm).
- Directorate of Economics and Statistics. Department of Agriculture and Cooperation. Ministry of Agriculture. Government of India. *Agricultural Statistics At a Glance 2011*. New Delhi: India. Directorate of Economics and Statistics, 2011.  
[http://eands.dacnet.nic.in/latest\\_20011.htm](http://eands.dacnet.nic.in/latest_20011.htm).
- Du Bois, Christine M. Chee-Beng Tan, and Sidney Wilfred Mintz, eds. *The World of Soy*. Urbana: University of Illinois, 2008.
- Du Bois, Christine M. "Social Context and Diet: Changing Soy Production and Consumption in the Untied States." In Du Bois et al., *The World of Soy*, 208-233.
- "Dupont Pioneer, Cargill Announce 2013 Plenish® High Oleic Soy IP Contract

Program.” Cargill. Accessed March 1, 2013.  
<http://www.cargill.com/news/releases/2012/NA3069013.jsp>.

*Food Inc.* Directed by Robert Kenner. Magnolia Home Entertainment, 2009. DVD.

“Grains and Oilseeds.” Cargill India. Accessed March 1, 2013.  
<http://www.cargill.co.in/en/products/grain-oilseeds/index.jsp>.

Harathi, K. and B. Deepthi Nanada. “Women Participation in Indian Agriculture.” In Ali et al., *WTO, Globalization, and Indian Agriculture*, 55-67.

“Iowa: Farms with Women Principal Operators, 2007 Census of Agriculture.” United States Department of Agriculture. Accessed February 18, 2013.  
[http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/Race,\\_Ethnicity\\_and\\_Gender\\_Profiles/Iowa/cpd99019.pdf](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/Race,_Ethnicity_and_Gender_Profiles/Iowa/cpd99019.pdf).

Jaiswal, Ankit. “Economics of Production and Value Addition to Soybean in Madhya Pradesh.” Master’s thesis, University of Agricultural Sciences, Dharwad, August 2009. <http://etd.uasd.edu/ft/th9969.pdf>.

Jharwal S.M., R.S. Deshpande, Vijay Paul Sharma, R.P.S. Malik, Brajesh Jha, and S.A. Ansari, eds. *Glimpses of Indian Agriculture: Macro and Micro Aspects*. 2 vols. New Delhi: Academic Foundation in Association with Directorate of Economics and Statistics, Dept. of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India and Agricultural Development and Rural Transformation Centre, Institute of Social and Economic Change, 2008.

Krishnaraj, Maithreyi and Amita Shah. *Women in Agriculture*. New Delhi: Academic Foundation, 2006.

Krishnaraj, Maithreyi. "Food Security, Agrarian Crisis and Rural Livelihoods: Implications for Women." *Economic and Political Weekly* (December 30 2006): 5376-388. <http://www.epw.in.proxy.libraries.rutgers.edu/review-agriculture/food-security-agrarian-crisis-and-rural-livelihoods.html>.

Kumari, P. Mercy, K. Mahendra Kumar, and B.S. Rao. “Globalization and the Changing role of Women in Agriculture.” In Ali et al., *WTO, Globalization, and Indian Agriculture*, 68-83.

“Locations.” Cargill India. Accessed March 1, 2013.  
<http://www.cargill.co.in/en/locations/index.jsp>.

Lyson, Thomas A., and Rick Welsh. "Agricultural Industrialization, Anticorporate Farming Laws, and Rural Community Welfare." *Environment and Planning A* 37 no. 8 (2005): 1479-491. doi:10.1068/a37142.

- McMichael, Philip. *Development and Social Change: A Global Perspective*. Thousand Oaks, CA: Pine Forge, 2000.
- Menon, Purnima, Anil Deolalikar, and Anjoy Bhaskar. *India State Hunger Index: Comparisons of Hunger Across States*. Washington D.C.: International Food Policy Research Institute, 2009.  
<http://www.ifpri.org/sites/default/files/publications/ishi08.pdf>.
- Mintz, Sidney W., Chee-Beng Tan, and Christine M. Du Bois. "Introduction: the Significance of Soy." In Du Bois et al., *The World of Soy*, 1-26.
- National Sample Survey Office. Government of India. Ministry of Statistics & Programme Implementation. *India- Employment and Unemployment: NSS 66<sup>th</sup> Round*. DDI-IND-MOSPI-NSSO-66-10-2011. New Delhi: India, NSSO, 2011.
- Office of the Registrar General and Census Commissioner, India. *Census of India, 2011: Provisional Population Totals*. 00-001-2011-Cen-Book (E). New Delhi: India, Office of Registrar General, 2011. [http://www.censusindia.gov.in/2011-prov-results/prov\\_results\\_paper1\\_india.html](http://www.censusindia.gov.in/2011-prov-results/prov_results_paper1_india.html).
- "Official Ram Trucks Super Bowl Commercial 'Farmer.'" YouTube video, 2:03. from the commercial televised by CBS on February 3, 2013, posted by "ram," February 3, 2013. <http://www.youtube.com/watch?v=AMpZ0TGjbWE>.
- Patel, Raj. *Stuffed and Starved: The Hidden Battle for the World Food System*. Brooklyn, NY: Melville House Pub., 2008.
- "Programs." Women, Food, and Agricultural Network. Accessed February 1, 2013.  
<http://www.wfan.org/Programs.html>.
- Rosenfeld, Rachel. *Farm Women: Work, Farm, and Family in the United States*. Chapel Hill: The University of North Carolina Press, 1985.
- Sachs, Carolyn E. *Gendered Fields: Rural Women, Agriculture, and Environment*. Boulder: Westview Press, 1996.
- Sachs, Carolyn E. *The Invisible Farmers: Women in Agricultural Production*. Totowa, NJ: Rowman & Allanheld, 1983.
- Sharma, Vijay Paul, Saradendu Patnaik, and Hiren Tilala. "Oilseeds and Oil Economy of India." In Jharwal et al., *Glimpses of Indian Agriculture: Macro and Micro Aspects*, 1: 161-172.
- Shinghi, Prakash M. and D.S. Parmar. "Processed Food Marketing in India: Selective Case Studies." In Jharwal et al., *Glimpses of Indian Agriculture: Macro and Micro Aspects*, 2: 885-898.

- Shiva, Vandana and Kunwar Jalees. *Farmers Suicides in India*. New Delhi: Research Foundation for Science, Technology and Ecology, 2005.
- Shiva, Vandana. *Globalization's New Wars: Seed, Water & Life Forms*. New Delhi: Women Unlimited, 2005.
- . *Stolen Harvest: The Hijacking of the Global Food Supply*. Cambridge, MA: South End, 2000.
- . *The Violence of the Green Revolution: Ecological Degradation and Political Conflict in Punjab*. Dehra Dun: Research Foundation for Science and Ecology, 1989.
- Singh, B. B. "Success of soybean in India: the early challenges and pioneer Promoters." *Asian Agri-History* 10 no. 1 (January – March 2006): 45-53. <http://agris.fao.org/agris-search/search/display.do?f=2009/IN/IN0601.xml;IN2006001862>.
- Singh, Gurdev and S.R. Asokan. "Contract Farming in India: Text and Cases." In *Glimpses of Indian Agriculture: Macro and Micro Aspects*, 2: 143-148.
- Singh, Shiv Prata, Laxan Puna Ji Gite, and Nidhi Argarwal. "Improved Farm Tools and Equipment for Women Workers for Increased Productivity and Reduced Drudgery." *Gender, Technology and Development* 10, no. 2 (2006): 229-230. doi: 10.1177/097185240601000204.
- "Soybean." In *The Cambridge World History of Food*. Volume 1. Cambridge: Cambridge University Press, 2000.
- United States Department of Agriculture. Economic Research Service. *Agricultural Contracting Update: Contracts in 2008*. By James M. MacDonald and Penni Korb. EIB-72. Washington D.C.: U.S. USDA, ERS, 2011. <http://www.ers.usda.gov/media/104365/eib72.pdf>.
- . Economic Research Service. *Profile of Hired Farmworkers, A 2008 Update*. By William Kandel. Economic Research Report Number 60. Washington D.C.: U.S. USDA, 2008. [http://www.ers.usda.gov/media/205619/err60\\_1\\_.pdf](http://www.ers.usda.gov/media/205619/err60_1_.pdf).
- . Economic Research Service. *Structure and Finances of U.S. Farms: Family Farm Report, 2010 Edition*. By Robert A. Hoppe and David E. Banker. EIB-66. Washington D.C.: U.S. USDA, ERS, 2010. [http://www.ers.usda.gov/media/184479/eib66\\_1\\_.pdf](http://www.ers.usda.gov/media/184479/eib66_1_.pdf).
- . Foreign Agricultural Service. *Oilseeds: World Markets and Trade, 1999*. Washington D.C.: U.S. USDA, 1999.

- Foreign Agricultural Service. *Oilseeds: World Markets and Trade, 2012*. Washington D.C.: U.S. USDA, 2012. <http://usda01.library.cornell.edu/usda/fas/oilseed-trade//2010s/2012/oilseed-trade-12-11-2012.pdf>.
- Foreign Agricultural Service. Production Supply and Distribution Online Database (Soy Production in India, accessed January 3, 2013). <http://www.fas.usda.gov/psdonline/psdQuery.aspx>.
- National Agricultural Statistics Service. *1997 Census of Agriculture*. AC97-A-51. Washington D.C.: U.S. USDA, 1999. <http://www.agcensus.usda.gov/Publications/1997/index.php>.
- National Agricultural Statistics Service. *2002 Census of Agriculture*. AC-02-A-51. Washington D.C.: U.S. USDA, 2004. <http://www.agcensus.usda.gov/Publications/2002/USVolume104.pdf>.
- National Agricultural Statistics Service. *2007 Census of Agriculture*. AC-07-A-51. Washington D.C.: U.S. USDA, 2009. [http://www.agcensus.usda.gov/Publications/2007/Full\\_Report/usv1.pdf](http://www.agcensus.usda.gov/Publications/2007/Full_Report/usv1.pdf).
- Vaidyanathan, A. *Agricultural Growth in India: Role of Technology, Incentives, and Institutions*. New Delhi: Oxford UP, 2010.
- Waldman, Amy. "India's Soybean Farmers Join the Global Village." *The New York Times*, January 1, 2004. <http://www.nytimes.com/2004/01/01/world/india-soybean-farmers-join-the-global-village.html?pagewanted=all&src=pm>.
- Walter, Gerry and Susan Wilson. "Silent Partners: Women in Farm Magazine Success Stories, 1934-1991." *Rural Sociology* 61, no. 2 (Summer 1996): 227-48.
- "Welcome to American Agri-Women: Agriculture Gives Big Thanks to Ram Trucks for So God Made a Farmer Super Bowl Commercial." American Agri-Women. Accessed February 16, 2013. <http://www.americanagriwomen.org/>.
- World Bank. World DataBank (India, Agriculture % of GDP), <http://databank.worldbank.org/>.