A Critique of Neoliberal Models of Food Production: Food Sovereignty as an Alternative Towards True Food Security.

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Table of Contents

List of Figures

Abstract

The purpose of this thesis is to provide a cogent critique of the potential of industrial agriculture to solving food insecurity. The commodification of food through industrial and capitalist modes of production has embedded global food supplies into a larger narrative of neoliberal economics that touts market based solutions as the answer to solving world hunger. Despite opening up to the free market economy and trade, some of the most agriculturally productive countries in the world are home to the most undernourished populations. This project will seek to give an understanding of the industrial agriculture system related to capitalist modes of production and whether or not the system serves the purpose of establishing food security, as well as offer recommendations for a different dialogue that focuses on food sovereignty as opposed to food security.

Preface & Acknowledgments

Food has been an interest of mine since I was a child that has changed over time. As a kid I was influenced by my parents and their appreciation for many different cultures. They helped me to understand the world through food. In community college, my interest in food developed towards the direction of agriculture when I decided to do a research project on the various implications of patented genetic material. It was through this research that I became aware of issues of food sovereignty and biotechnology in India. Upon my first semester at CU I took Professor Youkey's course on Environmental Ethics and joined a student run food co-op, propelling my research into understanding our food system even further. My initial interest in genetically modified seeds questioned health, ecological and biological implications. Today my interest has evolved into recognizing the fundamental consequences of the commodification of our food supply and what it means for the future of agriculture. As a result, I have been forced to look at food in an entirely different way, not as an instrument within an economic system, but as a basic and inalienable human right.

I would like to thank my committee for their support, patience and guidance with my project. Emily has offered an immense amount of feedback and has served as a resource to help me to navigate my ideas. Without her I would have never thought to use a political economy approach to my thesis. I would also like to thank Dave for being a resource for knowledge on the topic of food and agriculture. His class helped me to put the food system in perspective. I wouldn't be here if it wasn't for the environmental ethics course. I would like to thank Dale for his continued support through this process and for providing a fun and relaxed environment to meet and discuss ideas every week. I would also like to thank Adam, Xavier and Sabina for their admirable work and commitment to creating a more democratic food system. Finally I would like to thank my parents for all their help and support throughout my educational career, as well as instilling in me a great sense of appreciation and understanding of the world around me.

My advisers have contributed a considerable amount of time helping me edit my paper. Any mistakes remaining are my own.

Chapter 1: Introduction

This thesis is a study of the current framework of food security that is used to address the global issue of hunger in developing countries. Although there are numerous definitions, food security is primarily defined as the "physical and economic access, at all times, to sufficient, safe and nutritious food to meet dietary needs and food preferences for an active and healthy life" (WHO, FAO: CFS). Because this definition lacks some very important aspects, I propose the concept of food sovereignty as a method towards true food security and an alternative to the current system of achieving food security.

This definition of food security lacks two fundamental aspects on how to achieve food security; 1. how food is produced and 2. how it is distributed. Although it is not formally stated, in its most widely used definition, food security in developing countries is to be achieved through industrialized agriculture. This model of agriculture came about in the West during the Industrial Revolution but has since been translated to the developing world through the Green Revolution. Food security is also achieved through the distribution of agricultural goods through global markets under western liberal economic policies known as neoliberalism. Neoliberalism is a form of capitalism that relies on the market economy and favors a reduced role of government interference in the economy. Neoliberalism has been translated to developing countries through structural adjustment loans of the International Monetary Fund (IMF) and the World Bank.

Food security is the primary goal of nations to solve the issue of hunger. Initially, food insecurity was thought to be a result of scarce supply and increased population growth. Today, global production meets the needs to feed everyone on the planet an adequate diet. This leads me to my research question: "Does a westernized approach to agricultural production and economic

distribution serve as a method towards achieving food security?". In this thesis I hypothesize that dependence on global markets and industrial production practices do not serve to establish true food security, which is why I propose the concept of food sovereignty as an alternative. Food sovereignty is defined as "the right of peoples, communities, and countries to define their own agricultural, labor, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies" (Urioste 2013).

In analyzing food security and food sovereignty this thesis will approach the issue of hunger from a political economy perspective. Political economy seeks to understand the relationship between politics and economics and states that economics is highly political. In striving to establish food security, methods to resolve world hunger are embedded in a global economic scheme that relies on markets mechanisms as a way of adequately providing access to and distribution to food. Political economy is an important framework for evaluating policies in agriculture that have an impact on societies most affected by hunger. Governments and institutions think food security should be established through various economic policies that work within a neoliberalism framework, which will be discussed in the second chapter.

Next, I will present the alternative to the current method of food security: food sovereignty. Peasants and activists believe that true food security should be established through food sovereignty by creating more democratic forms of agricultural production and distribution.

Concepts of food sovereignty will be explored, including examples of current approaches to food sovereignty.

In the fourth chapter I analyze the current literature on food security to illustrate what the current conversation on ending world hunger looks like. To better understand how policies food security policies are carried out, I examine a working paper from Oxfam on food security policies in India. This document illustrates several methods that the Indian government uses to achieve the goal of food security. The approach to food security, as proposed in the paper by Oxfam, is used to present a few food security programs in India and how they function on the ground.

Finally, because this thesis points at the relationship between western ideals and its influence abroad through both industrial agriculture and neoliberal economic policies, I present three local cases that serve as examples of food sovereignty that could potentially be applied in communities abroad as a tool for solving issues of hunger and poverty.

Overall, the purpose of this project is to better understand the different methods to achieve food security, how these methods work to achieve this task and their outcomes. The ultimate purpose of this project is to give an alternative perspective to the dominant discourse of food security and to provide a critique of the methods currently employed in trying to end world hunger. The food system is very intricate which makes it difficult to conceptualize. I hope that my project can provide an illustration of the political and economic aspects of agriculture as it relates to hunger. I would like my project to serve as a stepping stone towards a conversation about more sustainable and equitable agricultural systems.

1.1 Background

During the spring and summer of 1974 Bangladesh experienced extreme weather that resulted in flooding and subsequent devastation of rice crops across the country. As prices for rice rose, famine became a clear consequence of the inability of people to purchase food. The same year the World Food Conference of the United Nations Food and Agriculture Organization (FAO) was established. The goal was to address world hunger in light of the famines in Bangladesh. It is here that the term food security was established in terms of food supply and defined as the "availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices". U.S. Secretary of State Henry Kissinger made an extremely bold declaration, calling for an end to hunger in 10 years. Although this has not been achieved, food security has been an ever evolving process.

Today it is defined as the ability to have access to an adequate amount of food. In 1983 the FAO redefined food security as a matter of both physical and economic access to food (FAO 1983). If we take into consideration current food production around the globe, enough food is produced to feed everyone (Weis 2007). Amartya Sen made the case for the importance of access to food in his book *Poverty and Famines* (1981). Sen states that the Bengali Famine was due to a lack of access as opposed to actual scarcity. Since then the UN and other institutions have changed the dialogue about hunger. The Food and Agriculture Organization of the United Nations states that the problem is not the supply of food that is in shortage, but rather access to food is the culprit for world hunger (FAO 2011). This has caused a shift from hunger as a product of scarcity to hunger as a matter of security. The FAO also recognizes that hunger is linked to poverty and that "agricultural growth involving smallholders, especially women, will

be most effective in reducing extreme poverty and hunger when it increases returns to labour and generates employment for the poor" (FAO 2012, 28).

1.2 Methods

This thesis explores ways in which food is produced and distributed within two different frameworks as a means to achieve food security. Industrial agricultural practices imply that an increase in yield is necessary to feed the world. At the same time neoliberal trade policies abroad are meant to ensure increased access to food. This is currently the way in which many countries strive to achieve food security and is demonstrated in books, articles and government reports (Swaminathan 2009; *Science* 2010; FAO 2009, 2011) . On the other hand, there are those that point out flaws in this system (Baviera and Bello 2009; La Via Campesina; Rosset 2006) because increased production and open markets don't necessarily ensure equitable distribution of resources, but rather resources are distributed to those that can afford it. This disparity of access is evident in the juxtaposition of an obesity epidemic in the West and a hunger epidemic in developing countries.

This calls into question what a truly democratic food system should look like and how actual food security should be achieved. We know that we have the means to produce enough food in the world to feed everyone. We know that there is ultimately an issue with access. Therefore it is important that we rethink our food system, how it functions and who it ultimately serves. A political economy approach is a way to understand these questions better as it asks who are the winners and losers of the neoliberalization and industrialization of agriculture.

This thesis will explore these questions through primary and secondary sources, analysis of current literature, examining food security policies and three case studies that demonstrate alternatives to the current food system within the food sovereignty framework.

1.3 Framework

The matter of hunger is not so much a question of available supply, but rather the access and distribution of it. Because food functions as a commodity within a capitalist mode of production it is subject to market activities that influences the way it is distributed. The commodification of food and global policies presents a number of constraints when trying to establish true food security. Access to food is essentially economic and political in nature (Southgate, Graham and Tweeten 2011).

In his book, *Late Victorian Holocausts*, Mike Davis argues that as a result of integration into capitalist markets, places like Brazil, Egypt, China and India experienced mass starvation. A series of weather patterns in the late 1800s resulted in crop failures due to drought during the monsoonal seasons in India. As a result of increased grain prices, decreased employment, and restrictive policies on rations and aid, millions of people died because of British colonial demand for wheat overseas. As Davis writes of the grain shortages in 1891:

> In Argul and the tributary states of Orissa, as well as in the neighboring Ganjam district in Madras Presidency, a failed monsoon and poor harvest were followed by a “price famine” - there was never really a true shortage of grain - that struck viciously at the pauper groups like the Pariahs, a tribal people who were prevented by new forest laws from “turning to jungle fruits and products on which they had customarily depended in the past in times of distress (122, Bhatia 168-69).

At the same time Europe's demand for wheat at a higher price due to global influences, such as poor harvests in Britain and higher wheat prices in the US, depleted supplies for the starving people in the Punjab region. Villagers who attempted to hold on to what little wheat they had were forced to give up their stock. The global pressures imposed upon India's wheat supply are a testament of how volatility in the global market can affect local accessibility to food. What Davis indicates is the underlying power inequalities that undermine people's ability to access food in association with integrated markets. Although colonialism served as the conduit for implementing policies and controls over new markets previously, those markets are accessed through neoliberal policies today.

A political economy framework provides a greater understanding of policies and agricultural production as they relate to food security. The political economy approach is defined as an investigation of "the structures of the economy and the set of power-laden relationships (worker-owner, industrialist-politician) that produce both the environment in which we live and our perception of it" (Robbins et al. 2010, 98). Political economy states that economics is highly political and that the economy shapes our understanding of the world around us. This framework will allow for a critique of the idea of current policies and economics as adequate for establishing food security. I argue that the economic system and its policies we rely on to solve world hunger does not particularly distribute food equitably and creates a false sense of food scarcity, despite producing enough food for everyone on the planet.

Cap it a lis m

Karl Marx is one of the most important economists largely known for his critique of the capitalist economic system. In his book *Cap it a l*, Marx discusses several concepts that can be

used to better understand the politics and economics of distribution. These concepts include labor, accumulation of capital and contradictions inherent within capitalism.

Labor and labor relations have transformed as a result of capitalism and industrialization. Originally individuals had economic autonomy. Individuals were able to acquire resources relatively freely, produced their own goods and were the owners of their own labor. The process of industrialization mechanized production practices that were previously done by individuals. This allowed for the emergence of a small capitalist class who own the means of production and a labor class that must sell their labor power. The laborer then produces goods which are sold in the market and the owner of the means of the production gets to keep the surplus value of those goods to be reinvested to produce more profit.

Before capitalism, people exchanged goods directly in barter economies. This was primarily because people controlled their own means of production and were able to access resources to do so freely. At the time, resources and land were owned in common. Privatization of communally owned land was a step towards capitalism today. People were inevitably pushed off the land, leading them to depend on selling their labor because they no longer had the resources or the land to produce their own goods or food. This process of enclosure and appropriation of the commons is known as primitive accumulation (Robbins et al. 2010).

In a capitalist system, the process of accumulation and growth must be continual in the face of diminishing returns, but this process also leads to economic crises. This is considered the first contradiction of capitalism and is evident recent financial crisis like the Great Depression and the global financial crisis of 2008 where spending and consumption declined, slowing the entire economic system. The second contradiction of capitalism states that because capitalism

requires production of goods through exploitive extraction of limited resources of the environment, the system ultimately undermines itself by undermining the environment.

Capitalism, production and distribution

First, it is important to understand how contemporary policies influence distribution of agricultural resources in the market. This will give us a better perspective on how the market fails to establish food security. Policy makers and institutions primarily focus on increases in yield, integration into markets and sustained economic growth as viable solutions to food insecurity and hunger (FAO, IFAD & WFP 2013). Increases in yield are typically attributed to the industrialization of agriculture.

Agricultural policies are typically implemented through neoliberal reforms such as privatization and trade liberalization by the World Bank through structural adjustments of the World Trade Organization and International Monetary Fund. Countries typically take out loans under a number of conditions such as lowering barriers to trade, devaluing currencies and privatizing industries that were once owned by the state. Although these political mechanisms are meant to stimulate economies of developing nations, they have often lead to environmental degradation, loss of national sovereignty and unfair competition in global markets. The goal of integration into markets is so that agricultural producers can achieve income through export production thus entitling individuals to purchasing power, increased income and increased food security.

As a result of integration into global markets, smaller subsistence farmers have progressively been replaced by larger commodity export producing firms throughout the world. Competition with surplus producing countries in international markets has lead to prices that are

determined by a small number of agro-food transnational corporations (TNCs), which have historically lead to low global prices for food and livestock, often below the cost of production and environmental degradation in importing countries (Rosset 2006; Weis 2007). Such competition has lead to mass depesantization in rural agricultural areas to more urban areas, thus increasing food insecurity and poverty.

Integration into global markets tends to favor medium or large industrial farms over smallholder farmers. They are better positioned for competing in global markets compared to smallholder farmers and generally benefit from access to an array of technologies. These types of agriculture generally focus on export commodity crop production that serve more as ‘a tenuous component of corporate global sourcing strategies’ (McMichael 2000: 23; Weiss 2007) than it does food security. As the demand from changing diets of emerging economies and societies grows, so too will large corporate farms, further marginalizing small farmers.

Ultimately the basic assumptions around food security are as follows 1. Westernized modes of agriculture that have little in common with culturally relevant forms of agriculture are the best way to achieve food security. This method of agriculture is primarily industrialized in nature and depends on large-scale monocrops in order to achieve the greatest yield per acre of land. 2. Commodity crop production for trade in global markets is ideal in diminishing poverty and establishing food security through raised income and purchasing power. These assumptions lead to policies that support such methods of agricultural production and economic distribution; however, it is important to recognize the failure of markets as a mechanism for equitable distribution of food in trying to solve world hunger. Thus, it is important to look at food sovereignty as a way in which individual countries can dictate the terms of their agricultural

production and protect themselves from external market influences, while at the same time promoting local food security that is culturally relevant.

Chapter 2: Neoliberal Models of Food Security

Neoliberalism is essentially a new form of liberalism that has emerged over the past several decades. Neoliberal policies are the tools through which capital economic ideals have been spread throughout the world in the name of development. In the early 1900s economic liberalism was influenced by scholars like Adam Smith who emphasized that individualism and economic competition were key to prosperity. Along with the industrial revolution came an acceptance of laissez faire economics and free trade. However, economic liberalism was put on hold due to economic collapse of the Great Depression in 1930.

Following the depression, New Deal programs that were meant to stimulate the economy were implemented. Many social welfare programs were implemented to help the poor and to reestablish a healthy economy post-war, largely influenced by British economist John Maynard Keynes. During this time, called the "Keynesian Era", there was increased government involvement in the economy, contrary to liberal economic ideals. In 1944 world leaders came together to discuss the world economic system at Bretton Woods. As a result, John Maynard Keynes and Harry Dexter White established both the IMF and the World Bank, whose initial mandate served the sole purpose of lending for reconstruction and development and ensuring balance of payments problems for post-war Europe (Steger and Roy 2010). At the time their mandate did not include the ability to intervene in national policy nor did they have control over individual governments' economic decisions (George 1999).

The expansion of the welfare state in the United States, marked by an active role of government, regulation of industry, social welfare and high taxes on the rich lasted from 1945-1975. The economic crisis of the 1970s brought progress to a halt. A mix of high petrol

prices, stagflation and falling corporate profits gave way to the new liberal ideal which claimed the economic downturn to be a direct result of the Keynesian Era policies. These 'neoliberals' believed in the worldwide spread of an economic model based on free markets and free trade, citing government regulation, high public spending and high tariff barriers to international trade as the cause for poor economic growth and inflation. This became the platform for understanding the lack of economic development in the global south (Steger and Roy 2010).

The neoliberal method of development was seen as the appropriate way to establish economic growth in developing countries. Economic tools of development were implemented through economic reform policies. They often required 1. liberalization of the economy by elimination of price controls, deregulating markets and lowering barriers to trade; 2. reduction of the role of the state in the economy through privatization of state-owned enterprises; and 3. fiscal austerity through controls of the money supply, elimination of budget deficits, decreases in government subsidies and funding of social services (Wilson 1994; Aminzade 2003; Taylor & Gans-Morse 2009; Agarwal 2011). These economic policies of the West were typically established overseas by structural adjustment programs and free trade agreements of the IMF and World Bank.

Neoliberal policies that are pro-market and emphasize government and social service rollbacks have had a number of consequences in the United States but even more so in less developed nations. These policies typically translate to integration of local economies into global markets by lowering barriers to trade. This puts individual farmers of developing nations in direct competition with corporate farmers of the world, like those in the United States and Brazil. The assumption is that countries with a comparative advantage to grow specific crops can

establish food security through free trade in global markets. This is problematic for a number of reasons. It establishes dependency on markets as a method to securing food security (Weiss 2007). After the 2008 global economic crash, many people became vulnerable to such market volatility and experienced severe bouts of hunger. Another reason why the assumption of comparative advantage in free markets is problematic is that countries which have accepted structural adjustment loans must do so under the condition that they minimize subsidies. At the same time, countries running on the platform of and imposing neoliberal reforms also maintain subsidies on their own crops. For instance western countries like the United States are able to sell crops, like corn, below the cost of production. This often results in a dumping of imports in developing countries whose farmers are unable to compete. This is evident in Mexico where many farmers have been outcompeted and driven out by imports of cheap corn that have flooded their markets. The irony of price protections in the West and liberalization of the lesser developed create unfair economic outcomes and does not help to increase food security.

Thus, neoliberalization has brought about an economic regime that stands to benefit countries of the West rather than small farmers of developing countries by opening up new markets around the globe for highly industrialized producers of a small number of countries to dump their agricultural commodities in. The free market principles that neoliberal prides itself on is only enforced on countries that must act under conditions set by the World Bank and IMF. Neoliberal policies relating to trade directly impacts food security. These policies make a large number of people vulnerable to volatility in the market and prevent farmers from protecting themselves economically. The goal of neoliberalism is to establish a global financial network and helps aid in the establishment of access to new markets for a global elite.

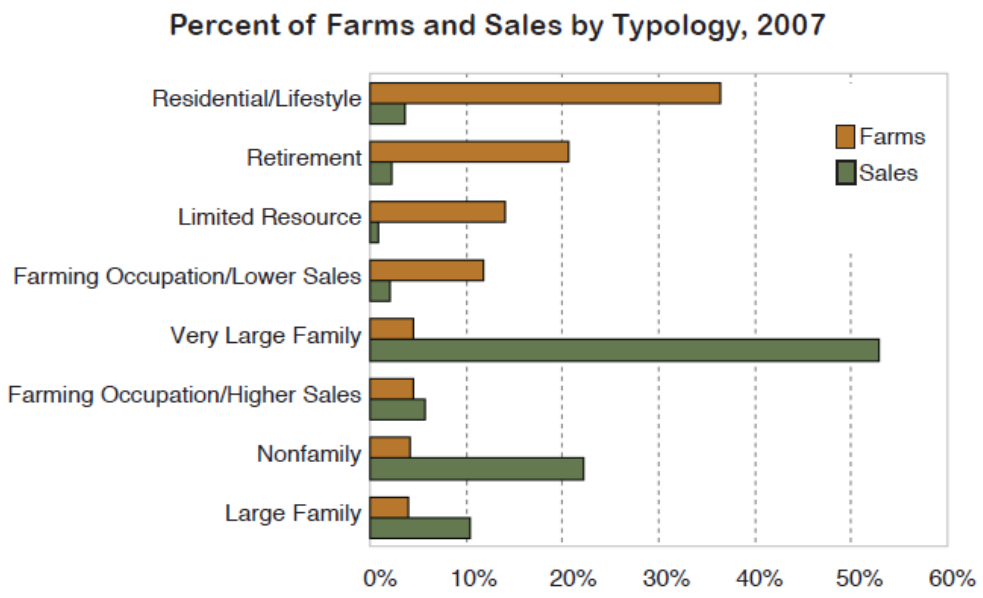
2.1 Industrial Agriculture

Agriculture, in its most basic sense, is the cultivation of plants and animals for the use of humans. The development of agriculture occurred 10,000 years ago. Prior to this, people were hunter gatherers and were quite mobile. With domestication of plants and animals came a much more sedentary lifestyle. Parts of Asia, Africa and South America were some of the first areas where domestication took place, allowing societies to innovate (Gupta 2004). Agriculture has always been an ever evolving process. People developed cultivation techniques and methods of selective breeding. Different types of agriculture spanned across different continents as well, making agriculture culturally specific and relevant. Because of this, agriculture provides a fundamental connection between humans and the land. Over the last century the identity of agriculture has changed from humans working more closely with nature to humans utilizing agriculture as a component within a capitalist system influenced by market forces under factory-like production. This shift in agriculture is primarily due to the technological advances and transformations in production that occurred as a result of the Industrial Revolution.

Starting in the 1700s in Britain, and in the 1800s in the United States, a transition from small scale in-home production to mass produced mechanized production began to take place during what is now known as the Industrial Revolution (Jones 1974). Following the mechanization and factory production of many industries came a new method of agricultural production modeled after many other industries. From small, labor intensive family farms emerged large, highly mechanized corporate factory farms in the 1900s (Kimbrell 2002). This new type of agriculture that we see today depends largely on machinery and off-farm inputs that were once sourced directly from the farm (Heffernan 1998; Fitzgerald 2010).This expansion of

agriculture coincided with population booms brought on by the Industrial Revolution (T. S. Ashton 4).

With the expansion of industrialized farming has come a shift in farm structure and an integration into the capitalist system. The United States was initially comprised of many smaller farms that provided for the immediate community. Once production processes began to change, agriculture operations became much larger in scale. Both vertical and horizontal integration became the norms of management. The establishment of the railroad system allowed for regional specialization. The industrialization of agriculture and penetration of capital into agriculture have led to a shaping of agricultural practices dictated by off farm actors. The consequences of this transition from a generally autonomous farmer towards a farmer that is simply a small component of the agri-food commodity chain have lead to the proletarianization of the farmer. In other words, farmers have become alienated from the product of their labor and have lost ownership to the means of production (Lewontin 1998). According to the EPA the number of farmers in the United States peaked at 6.8 million in 1935. Today there are 2.2 million farms. About 45% claim farming as their primary source of income. Furthermore, farm income varies with scale. Although residential farmers make up almost 40% of farmers in the United States, they make up less than 10% of annual sales. Conversely, very large farms that account for less than 10% of the farming population make up more than 50% of total annual farm sales as illustrated in the chart below (EPA). The transition towards larger farms is assumed to be due to increased efficiency; however, according to a 1985 Congressional Budget Office figures, the smallest U.S. farms had 94% higher total output per acre (in dollars) and 85% higher net profit per acre than farms in the largest size class (Strange 1998, Lappé 1998).



Source: EPA

Figure 2.1: Farm Structure and sales

Aside from outcompeting small farmers, the industrialization of agriculture has had a number of other implications too. Agriculture has also become intensive, lending to a degradation of soil quality, erosion and desertification of land. Planting is done in large monocrops of a single genetic variety, which contributes to a reduction in biodiversity and increased dependence on chemical inputs such as pesticides, petrochemical fertilizers and herbicides. This is due to a lack of genetic diversity and increased vulnerability (Bristow 2011). In one of the most famous early comparative studies of agriculture, Walter Goldschmidt compared two communities in the San Joaquin Valley surrounded by agriculture and found that larger scale farms have a greater number of negative impacts (Goldschmidt 1947, Carolan 2012). This is evident today as livestock operations move into rural communities often driving people out of their homes due to pollution of air, water and land. Real estate prices decrease as a result, making relocation difficult for many. Carolan states that ultimately impacts of farm structure

changed communities in terms of demographics, employment and community structure. At the same time structural changes in the 'food system' has translated to a globalized phenomenon with similar, consequences through the Green Revolution.

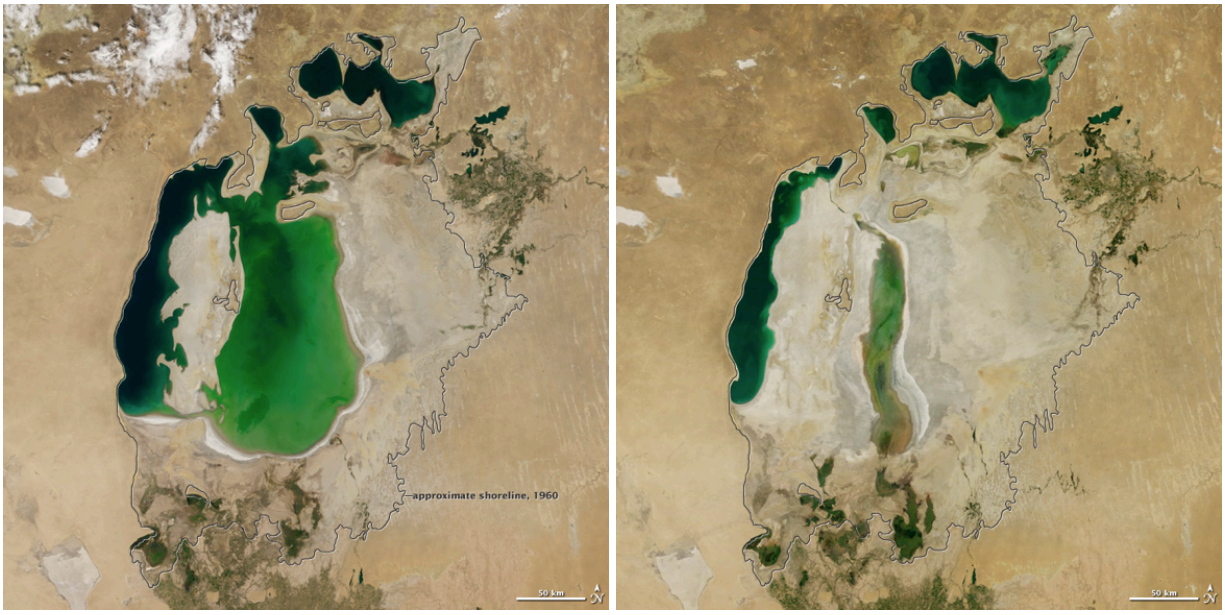
2.2 The Green Revolution

Despite increased food production in the mid 20th century as a result of the industrialization of agriculture in the United States, many people around the globe were faced with malnutrition and hunger. Starting in the 1940s the humanitarian efforts of the Green Revolution abroad allowed for the exportation of a Westernized type of agriculture to countries that were not as advanced in production methods, with an ultimate goal of defeating impending food shortages due to population growth (Hilden 1998).

Starting in the 1940s, Norman Borlaug, along with help of foundations, like the Rockefeller Foundation and the Ford Foundation, began to develop high-yielding varieties (HYV) of crops such as corn and wheat in Mexico. These varieties required a higher level of irrigation and fertilizers. Due to a lack of genetic diversity, these crops became vulnerable to disease and relied on an increase of pesticides and herbicides. chemical pesticides and fertilizers. The Green Revolution also promoted mono-cropping and the adoptation of mechanized forms of agriculture by implementing irrigation and the use of tractors and threshers (Bates 2009, Wold 1986). After its success in Mexico, the Green Revolution model of agriculture production was exported around the world.

Although there has been success in expanding a westernized form of agriculture to countries like Mexico, India and China; however, it has not been without consequences. Although initial efforts may have helped mitigate against hunger in less developed nations, over

800 million people are still starving and undernourished more than 50 years later. Expansion of the Green Revolution has lead to a number of negative impacts evident today. The high use of chemical inputs has led to a greater growth in fertilizer consumption than crop production: from 31 million tons in 1961 to over 141 million tons in 1999 (Bates 2009). The use of chemical inputs has also lead to environmental degradation, such as overuse of nitrogen fertilizers, pesticide resistance, loss of biodiversity and declining crop yields. Freshwater resources have diminished due to irrigation. Take for example the Aral Sea in central Asia which has lost half of its volume since the 1960s due to irrigation of crops such as cotton (NASA; Bates 2009).



Source: Lindsey, R; NASA;

Figure 2.2 Satellite image depicting border of shoreline of Aral Sea in 1960 as compared with August 25, 2000 and August 18, 2012.

Furthermore, Bates states that the cost of production has become considerably higher due to inputs. One example is the need to acquire high yielding seeds annually instead of the traditional practice of seed saving. Another is the increased use of inputs in response to field-evolved resistance to pesticides by target pests (Dhurua & Gujar 2011; Luna 2012). Farmers also rely

heavily on chemical inputs which are necessary in order to achieve any significant gains in yields. Investments in irrigation and farm machinery were also imperative for such high-volume farming. Over time, these high cost of production have led to fewer and fewer small farmers as this type of farming mostly stands to benefit those that have the financial means, forcing those without to seek credit, creating inequality and indebtedness (Swaminathan 2009; Falkner 2009). As a result, a trend towards larger farms, similar to that of the United States has occurred. Both competition against larger farms and machinery have lead to a displacement of workers and small farmers from rural areas to cities where individuals are confronted with poverty and nutrient deficiency (ibid).

Over time the argument for hunger has changed. Prior to the Green Revolution, a Malthusian argument of scarcity in the face of accelerated population growth was made. From this emerged the paradigm of increased production through the Green Revolution as a means for solving issues of hunger. Despite significant gains in production initially, there is evidence that yields are declining (Wolf 1986; Murgai 1999). Furthermore, farming practices around the world have been forever transformed. Today, farmers around the world are dependent on costly inputs, increased credit, increased mechanization and a reduction of small rural farmers, similar to the United States following industrialization.

Chapter 3 Food Sovereignty

Institutions promote food security as it pertains to solving hunger through market mechanisms, global trade and industrialized agricultural practices. In contrast, food sovereignty is an alternative to the current system in establishing food security. Coined by the international grassroots peasant group; La Via Campesina, in 1996 at the World Food Summit, the movement of food sovereignty towards resolving world hunger and poverty is essentially a response to the food security framework embedded in industrial agriculture, agricultural commodity trade liberalization and private property rights, all of which have been imposed on developing nations by the West as a form of economic development. At the heart of the food sovereignty movement is the focus on small-scale sustainable production that is dictated by individual people in order to create greater democracy in food and agricultural systems (La Via Campesina 2013a). Food security advocates position themselves against the dictation of global trans-national corporations and neoliberal policies. Their ultimate argument is that food should be treated as a human right and not as a commodity in order to end the injustices of poverty, hunger and environmental degradation.

La Via Campesina members are comprised of peasants, small and medium-scale farmers, landless people, women farmers, indigenous people, migrants and agricultural workers from around the world (ibid). The organization initially took root in the 1980s when agricultural leaders came together to realize their shared similarities through a number of delegations and organizational exchanges. They came to the realization that industrialization and liberalization of agriculture was leading to an unfavorable restructuring of agriculture. The movement came together to be formally recognized in April of 1993 in Mons, Belgium with 46 representatives

from the Americas, Asia, Europe and Africa, just before the initial inclusion of agriculture and food in the Uruguay Round of General Agreement on Tariffs and Trade (GATT). These individuals recognized the implications of the GATT Final Act and the creation of the WTO as a move away from national controlled economies to a market-driven global economy as a process that would dismantle agrarian structures and programs that peasants relied upon (La Via Campesina's Open Book).

The food sovereignty movement positions itself against neoliberal trade policies and industrial agriculture practices that have become globalized and have threatened a way of life for smallholder farmers; "As a response to the current irrational and irresponsible logic of production and to the political decisions which support it, we propose the following basic conditions in order to bring about an agricultural development which is ecologically sustainable, socially just. The right of small farmers to a living countryside. The right to a diversified agriculture. The right of every country to define its own agricultural policy" (La Via Campesina 2013a, Mons Declaration 1993). They argue that neoliberal policies do not allow for smallholder farmers to protect themselves from the market, nor do they agree with privatization and deregulation. They feel that neoliberal reform favors agriculture and transnational corporations over small and peasant farmers. They also believe that the movement towards industrial agriculture has led towards displacement of peasants into urban areas. La Via Campesina states that trade agreements of the WTO are detrimental to culture and livelihood. La Via Campesina, as part of the food sovereignty movement, recognizes the implications of industrial farming. They point out the increased concentration of capital by a small number of elite corporate farmers and the subsequent marginalization of small farmers. They claim that because food is

treated like a commodity, its falls within the same model of production, distribution and profit making scheme as with anything else, which does not serve the purpose of solving hunger.

In response to the globalization of policies and production, the food sovereignty movement expresses the need for change. La Via Campesina works to establish a greater role for and recognition of rural peasants in decision making processes. They have been able to do this by attending meetings of both the WTO and the Food and Agriculture Organization (FAO). Furthermore, they have been able to bring to light the concept of food sovereignty as a comprehensive alternative to food security by engaging in the World Food Summits and protesting agricultural trade policies of the WTO around the globe. They advocate for more national and regional communication as a way to facilitate a bottom-up approach to reforming the food system because they do not feel that the institutions and governments that created the problem will be the ones that enact actual change.

The International Planning Committee for Food Sovereignty (IPC) has outlined four pillars of food sovereignty. They include: the right to food; access to productive resources; mainstreaming of agroecological production; trade and local markets (ICARRD 2006). Based on these principles, a food sovereignty approach would advocate for the establishment of programs that help poor, rural individuals entitlements to productive land. They would advocate for the establishment of small-scale sustainable agriculture. This form of agriculture is intended to support the local community in generating income as well as local food security by producing both culturally and regionally relevant crops for subsistence as well as commodity crop production. The difference between the food security and food sovereignty approach is that the food security approach relies solely on entitlements in a top-down manner while a food

sovereignty seeks to resolve hunger and poverty from the bottom-up. Food sovereignty still relies on some top-down assistance, such as land and agriculture education programs, but is not solely dependent on it.

The overall message of the food sovereignty movement is that food is a basic human right. Because food functions as a commodity, it is not distributed in the market equitably. Furthermore, the peasant movement's identity is entrenched in agriculture and the ability to provide for themselves and their community. They believe they have a right to land, culture and to dictate the means of their own production.

Chapter 4: Analysis of the Food Security Debate

The most common definition of food security used by international institutions states the need for adequate access to food, but does not explicitly state how that food should be produced or distributed. The definition of food security is essentially vague and lacks some very important dimensions in addressing world hunger. However, the following five pieces of literature give insight as to how food security should be established. These are the book *Science and Sustainable Food Security* by M.S. Swaminathan, a literature review authored by a number of experts in *Science*, a report by the FAO: "How to Feed the World in 2050", a report on "*Safegaurding Food Security in Volatile Global Markets*" by the FAO and the book *Agriculture and Food in Crisis* by Mara Baviera and Walden Bello. In this next section I analyze these five pieces of literature that work to establish a method in which food security should be attained and illustrates the general outlook on the subject as a whole.

In *Science and Sustainable Food Security* (2009), Swaminathan's primary argument is that the collaboration of science, policy and receptiveness to technological advancement by farmers are the key to achieving food security, with poverty being the primary culprit for food insecurity. He proposes three main concepts that aim to help small holder farmers: increased economic opportunities, education and a concept called the "ever-green" revolution.

Swaminathan proposes some very important issues that tie agriculture with socio-economic issues, one being credit. The goal is to support smaller farmers through better financing by establishing better credit and insurance programs. Many poor rural farmers are unable to acquire credit. Access to credit with a safety net for farmers without indebiting them is

essential for the success of small farmers. Another economic method towards food security is through the production of value added products. He believes that small scale food processing and agribusiness enterprises could provide new economic avenues at a time when diets are beginning to change. Swaminathan also stresses the need for increased economic access to food for the poor and hungry. He proposes the idea of household entitlement cards to increase access to food.

Swaminanthan also stresses the need for education of farmers. He found that in villages in the Punjab region, farmers were extremely eager to use excessive amounts of water, pesticides and fertilizers, a consequence of the Green Revolution. He argues that in order for farmers to have a better understanding on effective use of such technologies, farmers must be better educated. His approach calls for more collaboration amongst farmers to achieve better understanding of how technologies can be used and dissemination of such information. Collaboration between researchers and farmers is another concept that is proposed by the author to help to decrease the risk and financial burdens that often cause some farmers to fail, especially in India. He also notes the need to keep younger generations interested in farming and says that intellectual challenges as well as economic prosperity are key to keeping youth interested in farming as well.

Swaminanathan proposes the concept of an ever-Green Revolution. This is both a response to and an extension of Norman Borlaug's Green Revolution. Swaminathan's goal is to increase yields at a time when the Green Revolution era seed technologies have hit a plateau. He recommends an increase in the use of technologies to maximize yield. At the same time, Swaminathan calls for preserving ecological integrity, conservation of natural resources and

social and gender equality. The transition from the Green Revolution to the ever-Green Revolution is a shift from a commodity-centered to a farming systems-centered approach.

In discussing Swaminathan's approach to creating viability for India's small farmers, he brings up a lot of important issues that relate to the social aspects of agriculture. It is extremely important to establish communication for information dissemination to make sure that technologies are used most efficiently and that farmers are not left to figure them out on their own. Additionally, communicating a method of agriculture that is more culturally relevant can help farmers better relate to agricultural techniques, rather than simply overlaying farming techniques that may otherwise be foreign to farmers. This is something that Swaminathan fails to point out. Swaminathan also talks about closing the yield gap between actual and potential yields in food production in order to garner the most profit for exports. The problem with this is it leaves farmers and communities vulnerable to market conditions. If the sole purpose of producing a crop is for exchange in the global market, as opposed to providing local food security, people that depend on the exchange will be vulnerable to uncertainties in the market. Rather than have to deal with these insecurities, Swaminathan should focus on generating higher yields to satisfy local needs and address both hunger and poverty. The social, economic and sustainability aspect that Swaminathan included in his ever-Green Revolution is an important component that was absent from Norman Borlaug's Green Revolution.

Second, in a literature review on food security in *Science* (2010), several experts weigh in on different measures needed in order to ensure food for a population of 9 billion by the year 2050. The authors foresee a world of increased affluence in which demand for food is

altered. The authors recognize that establishing food security must be done in a way that is sustainable, while at the same time solving world hunger.

The first issue the review discusses is the yield gap. In the challenge of feeding a growing population, bringing more land into cultivation is seen as a potential source of conflict for people living on the land. An option to increase food production without utilizing more land is to close the yield gap. A yield gap is the variation of crop yield in different areas of similar climate due to limitations on access to technologies or lack of investment on high-cost inputs. The review states that closing the yield gap increases food supply and would help with food insecurity at the same time as generating more income for farmers. In terms of smallholder farming the review states the difficulty in closing the yield gap for those without the economic means to, but proposes the idea of social and economic investment for women, who play a dominant role in the workforce.

The authors state the need for increased production limits. This basically means the conversion of solar energy conversion into biomass. The Green Revolution was able to achieve this through disease resistant varieties of wheat and rice that had higher yields in response to increased fertilizer and irrigation and the review calls for even more use of fertilizer and water so that production limits can be increased. Improvements in genetically modified crop production is a continuation of this, such as the selection for desirable traits. One example is drought tolerance, which will become increasingly important due to climate change and can be beneficial in increasing production.

A concern raised was reduction of food waste. The article states that 30-40% of food is wasted in both developed and developing countries. In the developing world, this is due to pre-retail losses (typically at the farm) as well as a lack of refrigeration in markets. However, the

article does take into consideration the increase of greenhouse gasses along with the increase of cold-storage. Despite the issue of greenhouse gasses, the authors call for public investment in transport infrastructure of developing countries, which would potentially reduce spoilage. They also cite "better-functioning markets and the availability of capital to increase the efficiency of the food chain" would help to get more food out to people (2010, 816). In the developed world food waste is due to a combination of cheap food and cosmetic standards. In the United States consumption must be altered in order to minimize waste.

The review goes on to talk about changing diets with increased income of people around the world will lead to a change in crops produced. The authors state that more cereals will be devoted to livestock production as people begin to consume more meat. Although this may seem to have a negative impact, if done properly, livestock can help regenerate grassland ecosystems that are otherwise unable to be converted into arable land.

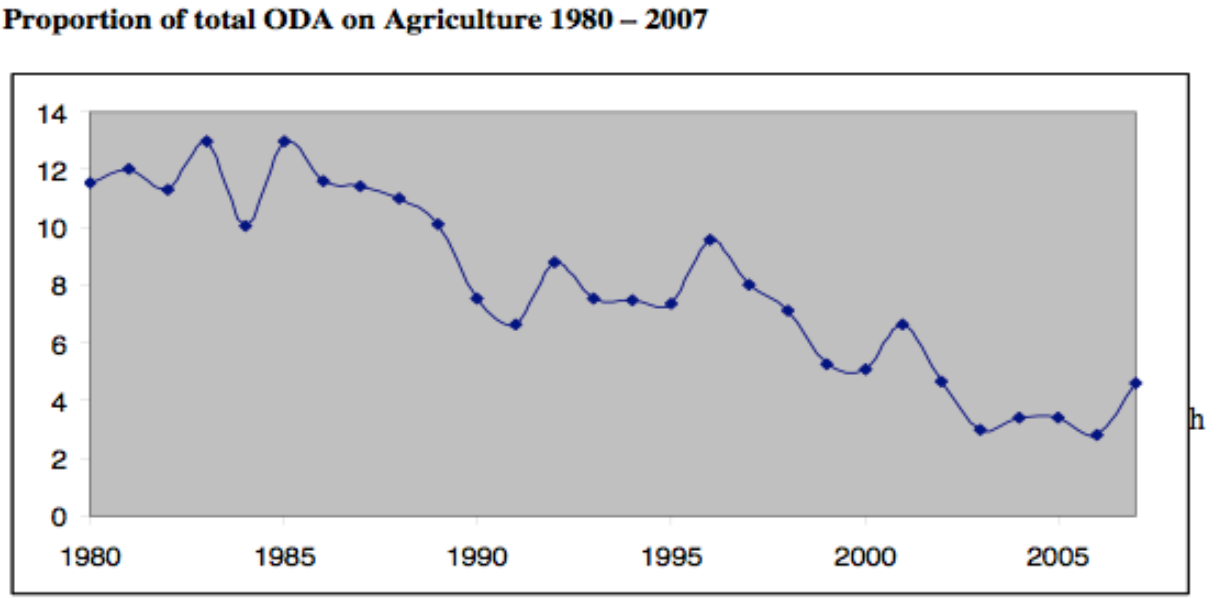
In analyzing the review of literature on food security, almost every suggestion on how to feed a world of 9 billion has to do with increasing production and generating more profit. The authors fail to suggest very many social changes that will be necessary for establishing food security and solely focus on economic means of food security; however, increased income does not automatically equate to access to more food. Nor does higher food production equate to more access to food. Genetically modified technologies could be beneficial but the authors did not indicate any of the social and economic implications of patented plant technologies. Similar to the Green Revolution, the gene revolution may stand to benefit farmers unequally depending on access to tools and technologies and the same mistakes of the previous decade should not be repeated. The authors did touch on distribution issues in their food waste section; however, more

detail on access to food should have been given. The authors also seem to support the increase in meat consumption and refutes the negative impacts of livestock farming for the sake of integrative grazing management, which is something that is certainly beneficial, but has yet to be employed on a widespread scale. If we are trying to achieve food security then competition for food for livestock versus humans needs to be considered.

Third, a report by the FAO, "How to Feed the World in 2050" (2009), discusses the prospects of food security in the future. The FAO states that despite decreasing rates of population growth, changes in socio-economic factors will influence dietary habits. As incomes rise, diets will become diverse and a demand for meat, fish, fruits, vegetables will increase. This in turn will have an effect on market chains and contribute to further concentration of supermarket chains. The report also questions the adequate supply of a natural resource base to meet demands. With the projected population increase, the report indicates the need for substantial increase of global food production. Despite the fear of a lack of natural resources to provide adequate supply, the FAO states the possibility of meeting global food supply demands of 2050.

A consensus among the participants concluded two things necessary for meeting future food needs. First is the need for increased investment and research in sustained productive agricultural growth as well as institutional reforms and sustainable resource management. This includes investment and creation of proper agriculture policies. The FAO recommends that developing countries should create conditions for gradual increase of investments in primary agriculture as well as rural infrastructure and indicate empirical evidence that insufficient investment has a detrimental impact on food security. The FAO also states the need for increased

volume of Official Development Assistance (ODA) for agriculture and rural development. The following figure shows the trend of ODA funding over time.



Source: FAO

Figure 4.1: Decrease in spending on agriculture services

Second, the goal should not solely focus on supply growth, but rather a focus on access is essential in feeding the worlds' hungry and poor. Fighting poverty, increasing food production in developing countries (80% in yield, 20% in arable land), supporting smallholder sector growth, since 75% of poor people live in rural areas and depend on agriculture sector either directly or indirectly, creating comprehensive social services, sustainable development and better trade for those dependent on imports are all ways in which access to food in developing countries may be increased. The report states that in light of recent growth of global food production, the number of chronically undernourished has grown and that adequate supply does not equate to proper nutrition overall, further confirming the need for creating access through different avenues.

This FAO report touches on a number of things that the *Science* article failed to

mention. Without addressing the issue of poverty, increasing production is almost useless, since the people in the most need do not have proper access, primarily due to income. Elimination of hunger will only be possible through establishment of proper safety nets for the poor. Although better trade is needed for import dependent countries, perhaps methods in establishing better local food security may be another option, which the report does not mention. Overall I think that recognizing access and poverty as the main culprits for food insecurity were demonstrated clearly in this FAO report, ultimately indicating that food and hunger are a political economic matter, not just a matter of supply.

Fourth, in the FAO report on "Safeguarding Food Security in Volatile Global Markets" (2011), the FAO argues that price volatility of global food markets requires protection of food prices due to the threat volatility imposes on food security. The FAO says that variability and uncertainty is a major threat to food security and reviews past policies associated with food vulnerability and states their shortcomings. They give an example of India leading up to the global food crisis of 2008 and fluctuations of rice prices in relation to both internal and external factors such as Indian government decision making when prices for rice started to fluctuate, as well as policy changes in other countries, such as Thailand, which caused world prices of rice to increase even further. This story of the global food crisis depicts the interdependency of domestic food prices in relation to global activities and its subsequent consequences.

The FAO primarily blames speculation on the market as the culprit for price swings that cause destabilization and gives a number of recommendations for improving policy. They call for multilateral rules that address times when food is no longer cheap, not just when prices are too high, in order to protect importing countries. Also stressed is a need for longterm global safety

net schemes that were otherwise used in short term crisis response in order to protect food importing countries against food price volatility. Finally there is a call for a global contract against excessive speculation of the market.

The FAO raises some very important issues. Following the price spikes in food and subsequent outcry all over the world in 2007-08 the vulnerability of food as a commodity in the market has become obvious. The FAO demonstrates vulnerability of importing countries to such activities in the market. Their view on establishing food security is purely economic and political, calling for a concerted effort of all nations to come together on a consensus on protecting prices of food globally for those who cannot afford such unpredictability in the market. Although this is an important aspect, it still leaves out a lot of factors, such as people who do not have access to food regardless of market conditions. Although not clearly stated, the book makes the case of the lack of efficiency of markets in distributing food and ensuring access. Because many countries today depend on the "free" market, proposing the need for price controls demonstrates a flaw in reliance on markets for distribution of food.

Another problem with depending on market policies that safeguard prices to help with food security issues is that is still leaves people dependent on external conditions to provide access to food and primarily focuses on protecting importing countries. Such policies only support commodity crops, as opposed to subsistence crops. Focusing on commodity price policies alone does not account for distribution or access and only looks at food through an economic lens. In order to ensure food security across the globe, a variety of actions need to be taken, not just reliance on market conditions and policy reforms.

Finally, the book *Agriculture and Food in Crisis* (2010), by Mara Baviera and Walden Bello, gives a synopsis of the 2007-2008 world food crisis. Food prices tripled in the least developed countries compared to 2000 prices. Countries levied high taxes on rice exports or simply did not export rice at all in an attempt to secure food supplies. Ultimately 75 million people were pushed into hunger and 125 million people faced poverty. Baviera and Bello point to a statement by the UN that addresses speculation of financial investors in commodities and commodity futures markets as having on impact on world prices.

> "[T]he most important factor [in the food price increases] was the large increase in biofuels production in the U.S. and the E.U. Without these increases, global wheat and maize stocks would not have declined appreciably, oilseed prices would not have tripled, and price increases due to other factors, such as droughts, would have been more moderate. Recent export bans and speculative activities would probably not have occurred because they were largely responses to rising prices" (Mitchell 2008).

A report by a World Bank economist claimed that an important factor of food price increases were attributed to agrofuel policies of the European Union and the United States. This is due to a number of energy policies that favor production of corn for fuels over food. The authors indicate that structural adjustment policies imposed on developing countries were the root of the problem that led to increased food insecurity in recent years. The authors critique neoliberal policies as the cause for food insecurity around the globe. In Mexico, U. S. agrofuel policies caused the price of imported corn, a staple food, to rise 60% in 2007. Structural adjustment policies of the 1980s and 90s forced Mexico to cut spending aimed towards supporting the agrarian sector that helped the peasant class. Services such as credit, extension and infrastructure support were cut ultimately leading to declines of agricultural productivity. The same is true for the Philippines.

Originally an exporter of rice, the country became dependent on imports following structural adjustment, which required the country to end its quota limit on imports. This in turn caused producers within the country to be replaced by imports.

Other concerns they raise include a movement towards a type of agriculture that contributes to depeasantization as well as corporate control of the food system. They also indicate a shift in food production due to demographic change towards meats, non-staple and processed foods when many of the world's poor depend on rice, wheat and corn. The spread of capitalist agriculture will likely worsen the poor's access to food as production is focused on food for profits, not a human right.

In analyzing the author's statements about food security, they seem to make some statements similar to the other pieces of literature. Like the FAO report on safeguarding food security, the authors raise concern about exposure to international price swings, but go on to mention the role structural adjustments play in contributing to food insecurity. The FAO report on world population in 2050 also stated distribution being an issue, but Baviera and Bello are a bit more critical of this issue, which is important.

Baviera and Bello differ from other authors because their criticisms of politics and economics of the food systems is from a food sovereignty perspective. They state that the capitalist nature of agriculture and neoliberal policies have contributed to an increase in poverty and movement of people off the land. Baviera and Bello do not find the industrial agriculture system conducive to establishing food security in any way because it is an industry, like many others, that has massive corporate control and whose bottom line is to make money. I think their

chapter raises some excellent points on the existing food system and its shortcomings that contribute to hunger, despite sufficient supply.

The pieces of literature on food security discussed here all recognize poverty as a roadblock on the path to ending world hunger. The FAO takes on a globalized approach in that top-down methods will be the key to solving issues of world hunger in the future. The *Science* review primarily focused on increasing production as a way to increase income so that people can become more food secure. This view lacks a lot of other factors that contribute to food security, but seems to be the main sentiment across the board.

The most convincing arguments for establishing food security now and in the future are M.S. Swaminathan's and Baviera and Bello's. Swaminathan has a much more localized approach that prevents against a 'one size fits most' view of how we should solve the problem of food insecurity. His vision calls for collaboration between research experts and those working on the ground. It will become increasingly important to allow for innovation and experimentation so that farmers can figure out firsthand what works best for them in their production methods while at the same time working towards sustainability in a way that makes economic sense and is socially and culturally relevant. Still, Swaminathan's approach to food security is still within the current food security paradigm in that it is dependent on farmers producing commodity crops and value-added crops to be sold in markets as a way to establish food security. Baviera and Bello point out the shortcomings in our current food system and raise concern for establishing food security in the future when we haven't been able to do so already.

In moving forward with food security, we must critically analyze our current food system because problems will not be solved under the framework which currently exists. There needs to

be a paradigm shift in the way we see food. That is recognizing food as a fundamental human right. Until then we will be plagued by the same issues for decades to come and will still be wrestling with how to feed 9 billion people in 2050 if this shift does not take place.

4.1 Food Security Policies in India

The cause of food insecurity has been recognized as having to do with a lack of access and distribution by food security advocates. This has translated into food distribution programs across India. In a country where a third of the population is poor, creating greater access and affordability for the most disadvantaged population is key to establishing food security. A report by Oxfam points out the struggle to keep up production along with population growth and emphasizes a food security system and price policy that consists of three main components: 1. procurement prices/minimum support prices, 2. buffer stocks and 3. public distribution system (PDS).

Minimum Support Prices and Procurement

India has a price policy for agricultural commodities that aim to do two things. The first is to provide a fair price to farmers for their goods that would encourage further investment and greater production while at the same time providing food to consumers at a reasonable price. The Commission for Agricultural Costs and Prices (CACP) is responsible for recommending minimum support prices (MSP) of 24 important crops annually. These crops include paddy (rice), jowar (sorghum), millet, various pulses, sugar, wheat, barley, cotton, jute and various oilseeds (CACP).

There are a couple issues that arise in light of price support programs of India. One is that consumption patterns in India are changing, resulting in an increase in foods not supported by the

CACP, namely fruits and vegetables. Figure 4.1 shows the decline of budget share of cereals from 1970/71-2004/05 in both rural and urban communities.

	Rural				Urban			
Year	Bottom 30%	Middle 40%	Top 30%	All	Bottom 30%	Middle 40%	Top 30%	All
1970-71	53.65	43.65	29.49	38.15	38.85	28.19	13.37	21.58
1990-91	39.37	30.68	18.22	25.93	27.55	19.13	9.49	15.12
1993-94	35.68	27.87	15.72	22.95	25.59	17.14	8.18	13.32
2004-05	29.34	22.04	12.49	18.28	20.59	13.29	6.29	10.21

Source: Government of India;

Figure 4.2:NSS Consumer Expenditure Survey

Second, it only allows price supports for specified crops, discouraging production of diversified crops. Since production of fruit and vegetable crops are concentrated in just a number of areas, crop failure can lead to dramatic price swings. For instance, the state of Maharashtra is responsible for 45% of India's onion production (Haq 2013). Crop loss in the region would result in price increases. Finally, Oxfam indicates that only 19% of farmers knew about MSP while another 10% knew but did not know where to sell their products, calling for a need to better publicize government programs across the nation.

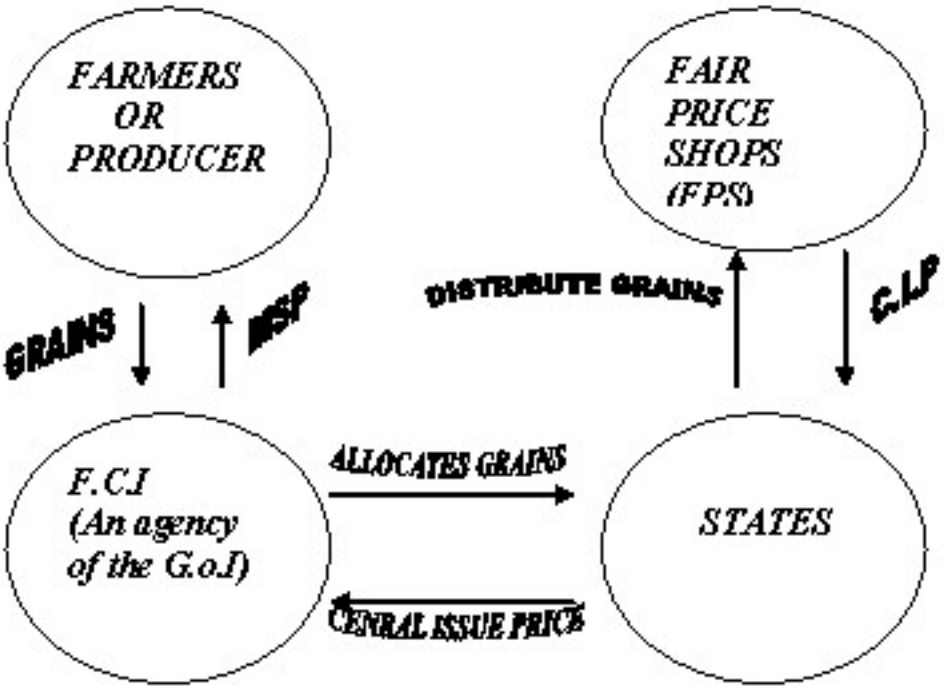
Buffer Stocks

Another way in which food security is achieved is through buffer stocks that are government controlled. The purpose of buffer stocks is to ensure stability of supply and protect against hunger in times of variable production through storage of commodity grains. However, in the book *Hope's Edge*, Francis Moore Lappé travels to India and mets with Shanta Kumar of the Ministry of Consumer Affairs and Public Distribution who is in charge of the fair-price shops. There, Shanta boasts of their record high surpluses; sixteen-million tons above their buffer stock of twenty-four-million. Lappé explains that the surplus alone provides thirty-two pounds of

grain for every individual in the state. Due to impending monsoon, Lappé asks what they plan to do with the grain he responds; "We'd like to export it if we can". Lappé goes on to ask Shanta why they don't make the surpluses available to so many hungry and starving in the state to which he responds "Oh we don't do that. We already give too many subsidies to the poor". Woven within the very fabric of the food security framework is a failing component in its attempt at providing for the hungry. Although this may not be the case in every state of India, it is not completely uncommon for the system to fail at providing sufficient food for those in need.

Public Distribution System

One example of allocation of resources under the food security framework in India is its Public Distribution System of food. Established by the Government of India and conducted under the Ministry of Consumer Affairs, the Public Distribution System is in charge of distribution of subsidized commodities, such as wheat, rice and sugar, in partnership with states (Union Budget & Economic Survey, Planning Commission). The subsidized commodities are typically distributed through one of India's 500,000 public distribution shops. Figure 4.1 illustrates the distribution system. The goal is to provide food security to those living below and slightly above poverty level by providing entitlements. Those that qualify financially receive an Antydaya card in order to get their entitlements.



Source: Chadha,M.; Centre for Civil Society;

Figure 4.3 Food Distribution Program of India

There are a number of criticisms that have come out in response to flaws of the distribution system. It has been found that the some food grain is diverted from public distribution shops to other areas, sometimes leaving the country to go to places like Nepal and Bangladesh (IndiaTimes.com). India's government had cited complaints of low quality of goods. Also it is argued that the program lacks the distribution of socially relevant foods for specific groups of people (Balasubramaniam 2011a). One case illustrates corruption of public distribution shops. People with the Antydaya card necessary for receiving subsidized food are entitled to 29 kg of rice and 6 kg of wheat at Rs 3 and Rs 2 respectively; however, in Heggadadevanakote Taluk of the Mysore District it was found that people were actually receiving 25 kg of rice at Rs 3.25 and 3 kg of wheat at Rs 2.25, unbeknownst to the locals (Balasubramaniam 2011b). Sometimes receiving the card is difficult for some of the poorest and disadvantage because they

do not have the resources to arrange for transportation to the office, money for bribes or simply do not have the physical capability.

Another criticism of the food distribution program of India is that it does not take into account an integral component of hunger; poverty. The distribution program tries to establish food security by making available secure resources of cheap food; however, does nothing to address the issue of poverty. The issue of poverty is pointed out in Principle 3 as important to solving food security. People that rely on the food distribution are dependent on a system that is responsible for providing them with food but does not go beyond that. A food security approach could recommend direct payments as an alternative to entitlements as a way of enabling the poorest better purchasing power; however there are a number of consequences. One is that the corruption involved with the distribution of the food grains had already demonstrated to be an issue. Distributing money may further fuel corruption in other ways and further hinder access to resources for the poor. Second, distribution of money does not guarantee it will be used towards food. Finally, direct payments do not do anything to solve the root cause of poverty, such as lack of land ownership and employment.

A Food Sovereignty Approach

A food sovereignty approach in India would differ from a food security approach towards hunger in a number of different ways. Food sovereignty policies in India may try to actually increase access to land so that individuals can produce their own food locally. It would decrease the reliance on external inputs for production by increasing the availability of native land races of seed. A food sovereignty approach would also provide education and collaboration for sustainable small-scale agricultural production. Food sovereignty would promote agricultural

diversity by producing both subsistence crop production as well as some commodity crop production to support both food security and income, but does not rely on commodity crop production alone. Finally, a food sovereignty approach, although bottom-up in nature, would require some top-down institutional support in India.

Chapter 5: Case Studies

As previously stated industrialized modes of production of the westernized world have been replicated in developing countries through the Green Revolution. This has helped to integrate nations into the global food economy for both export commodity crop production and consumption of foreign inputs through neoliberal reforms and trade policies. The following section will examine three local organizations within the Denver/Boulder community that work outside the industrial model of agriculture production and distribution. Because this thesis argues that the influence of developed countries on lesser developed countries does not achieve the purpose of food security, I offer these case studies, that are more aligned with food sovereignty, as potential programs that could be used as an alternative to the current methods used to achieve food security.

Case Study: The GrowHaus

I first interviewed Adam Brock, director of operations of the GrowHaus, a permaculture greenhouse situated in Commerce City's Elyria-Swansea neighborhood. What was once an industrial working class neighborhood primarily occupied by Eastern European immigrants, is now a predominantly Latino neighborhood isolated by industry and heavily polluted (The GrowHaus). What is unique about the neighborhood is that it is located in a "food desert", that is the people of Elyria-Swansea are in an area where affordable and nutritious food is not in direct proximity to where the residents live. According to Adam; "The GrowHaus' role is to work hand in hand with the community in Elyria-Swansea to rebuild the food system in the neighborhood from the ground up because it is not meeting the needs of the community very well. We want to create a new food system that not just provides healthy foods that are affordable, but also

provides jobs, beauty and nourishment in more ways than just calories". The GrowHaus is able to achieve this through food production, education and distribution.

One of the goals of the GrowHaus is to establish affordable healthy food to the community. Adam explains they are able to sell food below prices of local big-box chain retailers. This is achieved through the box program that sells its own produce as well as food products bought in bulk from other suppliers creating a box with a variety of foods to be sold to 2 different markets. The first market is the local community which is able to purchase the boxes at cost. The second market are those living outside the community that purchase the boxes at a retail price, typically in supermarkets. This helps to subsidize the cost of the boxes to the community who would otherwise be unable to purchase them. Furthermore, the community is able to purchase these goods for less than what it would cost to purchase them from a grocery store.

When asked about successes and challenges with the GrowHaus, Adam points to the endeavor of establishing trust with the community, something that took time and effort from the GrowHaus. Aside from the box program, Adam has been able to implement a number of other programs to involve the community, such as the micro-farming program that teaches people in the neighborhood how to make money from growing food. The GrowHaus also involves youth through their summer program, of which some participants have continued their involvement with the GrowHaus. A challenge that Adam points out is "balancing the need to provide quality food and support local farmers with the need to keep the farmers. We want to support local farmers and make sure they are getting a fair price for their food so they can make a living wage. But at the same time, the price that we need to pay the farmers to do that, we can't really sell the

food at that price to people in the neighborhood because they cannot afford it." Because it is difficult to provide a fair price to farmers and a fair price to consumers, it is necessary to subsidize the cost of food for those who cannot afford it by charging those that can afford it a bit more. In creating a more food secure system, it is necessary to think of creative programs like the box program in order to cater to the needs of the community in a cost effective manner.

Adam says that through his experience working at the GrowHaus he has not only learned everything from facility management, to non-profits, greenhouses and to commercial scale food production, but also "how to act in solidarity with communities that don't have access to the privileges that other communities have and how to really listen and how to be of support to communities that isn't just giving handouts, but really nurturing leaders and letting those communities be heard instead of speaking on their behalf". What Adam points out here is key to the food sovereignty approach, as it is not just a handout program, but a transformation of communities.

Adam hopes to continue the process of empowerment within the community and the process of lead by and lead for the community. He also would like to see food related businesses take off in the neighborhood with the Growhaus being a sort of the backbone, but rather the concept proliferating in the community. I also asked Adam if his model of food distribution and access could be repeated on a more widespread scale. Because it is different from the top-down model, he says that it takes different expectations in the establishment of such a project. Adam indicates that this model is not "cookie-cutter", but rather it will be important in understanding the needs of each community such as infrastructure, history and culture. Ultimately it takes more work and more time but in the long run will have what it takes to endure.

The GrowHaus is not only trying to provide access to cheap, healthy food for lower-income individuals, but it is also trying to provide employment and a livlihood for those living in the community at the GrowHaus. Although the community of Elyria-Swansea may not be able to become self-sufficient in food production completely, what Adam and the GrowHaus are trying to do is create small changes in the system and help to transform individual communities in the way they think about access and production of food. This is a great example of a food sovereignty approach to food security because the GrowHaus educates the community and helps facilitate change through relationships and engagement.

Case Study: The Second Kitchen

Next, I spoke with Sabina Bastias, one of the founding members of The Second Kitchen food co-op, which initially started as a student food buying club for the community of students at the University of Colorado Boulder. Sabina has always had a passion for food, but it wasn't until the summer before college that she got a taste of hands-on agriculture and Bells Bend Farm, which ultimately gave her perspective on food and changed her life. Sabina describes how "Bells Bend was initiated to stop a large development planned for the neighborhood, showing the city council how much value the land had. Community members donated plots from their property to start a CSA and attended council meetings defending the land. Growing up I never really understood what it was like to be a part of a community outside of my family. It was beautiful to be accepted by people I didn't really know, but would soon grow close to. Even though the farm now has over a hundred CSA members, I saw it transform from nothing to a center for community support." In her freshmen year she became a steering committee memeber for CU Going Local, a permaculture sustainability club for students on campus. The club targeted many

aspects of food education such as documentaries, student gardens, field trips, low income gardens and food sourcing for the university. Her group attended the Real Food Challenge NW Summit in Missoula, Montana. Upon returning, she set up meetings with the school administration to try and source better food for the school but quickly came to realize the red tape and difficulties of accomplishing such a goal. From there, Sabina and two friends went on to establishing the food buying club with two friends. The three of them became co-founders of The Second Kitchen food co-op or 'TSK'.

Sabina states that the purpose of the co-op is it "serves as a food-buying cooperative that creates community around food mindfulness and appreciation. TSK utilizes our member buying power to purchase food locally, organically, consciously, and sustainably. TSK strives every day to change our current food system by buying in bulk, eliminating packaging, and creating awareness around". Additionally Sabina states, "TSK is a community building hub for local, sustainable, affordable food. On a basic level it serves to feed the community. On a deeper level it provides the community with a home base for gathering around progressive sustainable issues that are on the forefront of their concern. It is also a place for relaxation and fun!" Over the course of the summer of 2013, TSK transitioned from a student food buying club largely spread through word of mouth into a community co-op in the Hill neighborhood of Boulder. The co-op has worked to raise awareness of it's activity on the Hill through community outreach, as well as establishing and growing its producer community.

Sabina states that some of the challenges of the food co-op has been the hard work, time and learning curve of understanding finance of a business, as that was one of her tasks in the co-op. When I asked Sabina what she has learned, she said that "change takes time and never

underestimate the power of a simple idea. TSK could have never worked if the three founders were to have done it alone. It showed me the power of community and how much dialogue can have an impact on what people can do. The idea behind TSK was simple: good food and at affordable price, but the only way to agree on what is good and what is affordable is by talking to each other".

Sabina says that she is optimistic for the future of farming and co-ops. She would like to see more support for small scale farmers and farm workers, are paid a fair price and employ best practices for maintaining ecological health. When asked if this model could be repeated, Sabina was hopeful but indicated the need for a great amount of planning and coordination.

The food cooperative is an excellent example of distribution of food outside global trade. Food is acquired directly from farmers or from local distributors that is then accessible to the local community of Boulder. This concept is relevant to the food sovereignty pillar of trade and food by offering farmers alternative markets that are much more local and not influenced by global markets.

Case Study: Boulder Food Rescue

Finally, I met with Xavier of Boulder Food Rescue. Boulder Food Rescue is a non-profit organization that primarily uses volunteer bike power to take fresh, perishable food from a number of grocery stores and restaurants that would otherwise go to waste and redistributes it to other non-profits that use it up immediately. Xavier is a student at the University of Boulder, Colorado and has always been interested in issues surrounding food, such as food justice. Xavier describes how waste of food really struck home with him as food resourcefulness was always instilled in him by his mother, a refugee from Laos. He soon got involved with Boulder Food

Rescue and is currently member of the board as well as a coordinator. Xavier helps with both fundraising as well as on the ground operations such as coordinating volunteers, working with grocery stores to donate food and making pick-up schedules. Boulder food rescue delivers food to 45 non-profits and is a source for fresh foods to communities that would otherwise recieve canned and packaged foods. Boulder Food Rescue also encourages a more hands-on approach in interaction with their food. One aspect of BFR is the educational outreach that it does both at the K-12 level and at CU. BFR speaks on food waste and on the larger injustices and flaws of the food system and.

When asked about accomplishments and challenges, one thing that Xavier pointed out was that after resistance for quite some time, Whole Foods and on Pearl finally decided to donate to BFR. Large-scale and corporate businesses have been resistant over-all compared to local businesses. Neither Kroger or Safeway currently donate their wasted food to BFR. More and more people are contacting BFR on how they can donate, too. Not only is BFR breaking ground in Boulder, but people have been contacting the organization to learn how they can get a similar system started in their community too. BFR has developed resources, such as the Package Deal to inform those interested on how they can implement their own bike-powered food rescue. BFR has seen similar organizations pop up from Ft. Collins and Denver to Europe. BFR has also created a software program in charge of coordinating volunteer schedules and quantifying amount of food rescued that is free for the public to use. Xavier also mentions a goal of BFR is for some sort of policy around food waste by grocery stores and other food outlets, as well as making individuals more conscientious of their waste.

In Xavier's experience with BFR, he has learned a lot about the food system and how it functions and where it can be improved. He has learned how to be a resource to the community on the topic of food waste. Acquired skills include growth of knowledge in grassroots and DIY organizing. Additionally, Xavier has learned that everywhere you go the issue of food waste is ubiquitous whether it be the community of Boulder or beyond. In terms of BFR he hopes that the organization can become a state-wide non profit that can provide monetary resources to others wanting to start a similar program in their own community. According to Xavier, the BFR's model of volunteer-based, bike-powered food rescue can be replicated, but he is curious to see how it will play out in cities larger than Denver. He envisions a version that is "hyper-localized within small subsets" of urban cities. "Food can be effectively be rescued from any city, it just needs creativity." That creativity involves meeting the needs of community and being able to navigate whatever hurdles they encounter, be it on bike or in rescue.

Boulder Food Rescue is working within the traditional system to alleviate the issue of food waste by redistributing food. Both in developing countries and the West food goes to waste in significant amounts (Godfray et al. 2010). The industrial model's ability to grow surplus supplies of food has created an issue of food waste. In the West it is typically due to perceptions of what is fresh and edible looking while in places like India it is due to lack of refrigeration.

The review in *Science* (2010) mentioned in chapter 4 discusses the issue of food waste; however, there are two reasons why Boulder Food Rescue is within the food sovereignty framework and the *Science* article in the within the food security framework. First the review on food security talks about better distribution of food to prevent waste within markets. Boulder Food Rescue works outside of capitalist markets to redistribute food. The food rescue

organization distributes food to people who would otherwise not have access. Second, it distributes food in a way that generates little to no greenhouse gasses because 80-90% of the food distributed is done by bike (this varies depending on the weather). The *Science* article suggests refrigeration and investment in better transport for better distribution. Both contribute to an increase in greenhouse gas emissions.

Because there is a reliance on economic systems for allocation of goods, food is not properly distributed. This is an excellent example of a food sovereignty approach because food that would normally be thrown away is redistributed to individuals that would otherwise not have access. Furthermore the food that is being redistributed is fresh food, unlike other forms of food distribution that rely on non-perishables.

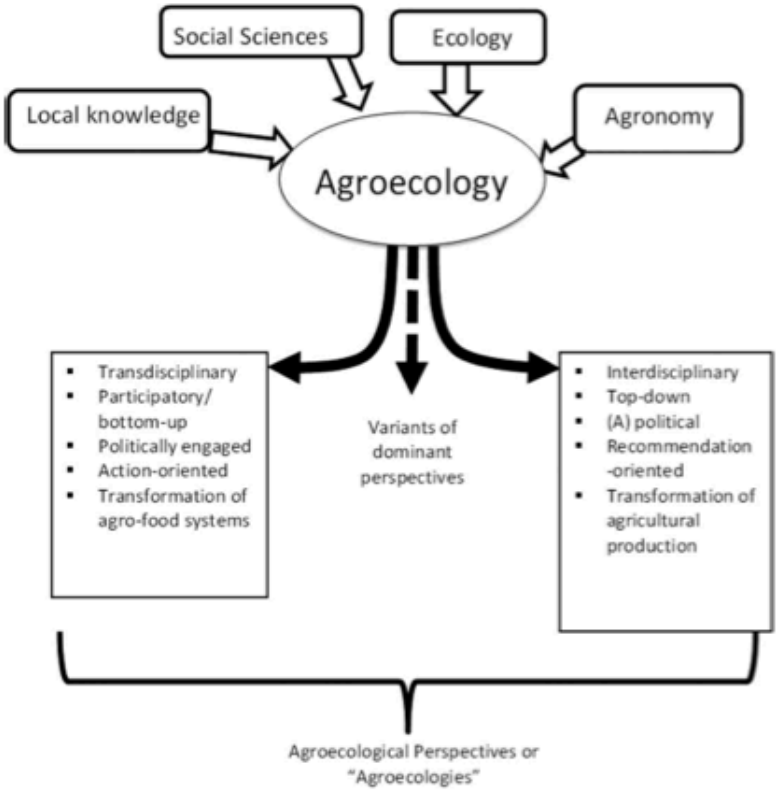
The examples mentioned above are ways in which food sovereignty and increasing access outside traditional means can be achieved in developing countries. This is not to say that these models should be exported and overlain the way the Green Revolution and neoliberal trade policies have; rather they can serve as recommendations and loosely based models. In fact, food sovereignty already exists in countries around the world.

Other Methods of Food Sovereignty

There are other ways in which food sovereignty can be used as a method to food security. Because food security does not indicate how food should be produced, food sovereignty makes the case for ecologically sustainable forms of agriculture. One example of ecologically minded agriculture is agroecology. In response to industrial farming systems that are dependent on tools and technologies that may not always serve the wellbeing of individuals and the environment, agroecology is an alternative that can provide a culturally relevant and economically viable

alternative to industrialized agriculture for small farmers (Altieri 1987). Instead of depending on costly inputs and patented seeds, an agroecological approach focuses on participatory research between farmers and experts, development of local landraces and an emphasis on ecological process associated with agriculture. Agroecology is practiced throughout the world in places like Zambia, Burkina Faso, Nicaragua, India, Netherlands and China. Agroecology is a multidisciplinary approach and requires a variety of perspectives in order to achieve productive and relevant agriculture. Figure 5.1 shows the process of agroecological input and output. It is not just the physical practice of agriculture, but also incorporates social and scientific elements (Méndez et al 2013).

Another method of food sovereignty is seed saving. As a result of industrialization of agriculture, only a number of varieties are plants are currently produced, lending to the decrease in biological diversity. The patenting of seeds has also raised some ethical questions around ownership of life as proprietary material. As a response to the political economy of the patenting of seeds (Kloppenberg 2004), people have started to save varieties of seeds to promote ecological diversity and cultural relevancy. Furthermore, the act of seed saving is a call to action against the ownership of seed by a small number of biotechnology companies. Vandana Shiva, a scientist and food activist in India, is the founder of an organization called Navdanya. She has created a network of seed keepers with 111 seed banks across 17 states in India. The organizations message is a direct opposition to corporate ownership of seeds and a right to the very material necessary for sovereignty in what is called seed sovereignty.



Source: Mendez et al 2013

Figure 5.1: Agroecology as a form of agriculture that is multidisciplinary

In Brazil, the city of Belo Horizonte has made access to food a right to its 2.5 million citizens. Some people in the region cannot afford food from grocery retailers. Local access to urban markets are increased for farmers so that consumers can purchase food directly, thus avoiding retailer markup. The National Coordination of Peasant Operations (CNOP) in Mali is composed of several federations of farmers representing the interests of 2.5 million farmers. The goal of CNOP is to build members' capacity to influence agricultural policy. In 2006 CNOP was successful in becoming one of the first countries to write food sovereignty into law through the development of agricultural policies (La Via Campesina 2013b).

Chapter 6: Conclusions

Trying to solve issues surrounding world hunger is not a simple or easy task. Although we have made many improvements in producing enough food to feed everyone on the planet, we must now begin to direct our attention towards creating more equity and sovereignty for individuals within the food system. In moving from a dialogue of food security embedded in global trade and neoliberal economics to food sovereignty, we must begin to understand the role of food sovereignty as a way of reforming agricultural systems that largely benefit corporations and large agricultural producers. By enabling people the right to food we are empowering individuals and allowing them to be more self sufficient, but this cannot be done alone. In order for food sovereignty to be successful there are a number of measures that need to be taken in order to ensure the livelihood of small farmers and their communities. These measures include a right to land, reforming developmental processes and institutional and governmental support.

With the transformation of agriculture from rural and small to industrial and large, there has been a loss of land ownership for many. Often people are either forced to become laborers for capitalist agricultural operations or are forced into urban centers where economic opportunities are restricted (Mittal 2002). When farmers lose their land and become farm laborers to corporate farms, they no longer own the means for their own production but must resort to selling their labor. Other times people are forced off the land and into urban slums where they must compete for employment. Landownership will provide a means for individuals to establish a livelihood and to create food security for themselves and their community. The will also reestablish the means for their own production. Furthermore, land ownership, poverty and hunger are interconnected. Allowing people ownership of land and the ability to produce their

own food will allow for a decrease in poverty and an increase in food security. Additionally, it is important to provide land to small holder farmers because they can produce food in a way that is ecologically sustainable, unlike their industrial counterpart. Therefore, land should be given to individuals for the purpose of smallholder agricultural production.

The industrialized nations of the world have overseen development of less developed countries through structural adjustment and economic reforms that expect immediate results. In establishing food sovereignty it is important to realize that development will not be easy nor will it be quick or ideally efficient. It is not right to assume that all countries should develop in the same process; therefore, development and progress should be seen as a diverse process that will vary from region to region and will require collaboration from various stakeholders.

As much as food sovereignty relies on the action of local communities and individuals, it will also need the support from governments and institutions. Economic safety nets that protect small farmers are imperative. Because subsidies have long been used by industrialized nations as an incentive towards larger and larger farming operations, there should also be monetary incentives for small, local and environmentally sound agricultural practices. Educational collaboration between the expertise of science and the lay knowledge of individual farmers is crucial in the developmental process. Local and state governments should work with smallholder farmers to ensure their livelihood and success.

Returning land to small farmers and localizing production are both important in establishing a true form of food security. This is not to say that all food production should be localized. We live in a globalized world and people move to different countries and establish homes in new places where they want to continue practicing their culture and various ways,

including the enjoyment of food from their home country. Regional specialization and global trade of food enables us to do this and all forms of globalized food production should not be inhibited. However, there is something to be said about the individual whose livelihood depends on the land. It is not morally right to marginalize those who depend on agriculture for their existence in the name of progress and technology. We should respect the individual's choice and their right to life, land and food, rather than to be subject to the larger global food economy. It is not only peasant organizations like La Via Campesina that recognize food as a right and the importance of small-scale sustainable agriculture. The United Nations also recognizes food as a right and recognizes the benefit of small-scale, ecologically mindful agriculture as a way to increase productivity, reduce poverty and increase nutrition (De Shutter 2010), which ultimately is why food sovereignty is a viable solution in redefining the current approach towards establishing food security.

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