

ASSESSING FLAGSTAFF'S LOCAL FOOD SYSTEM RESILIENCE:
RECOMMENDATIONS FOR BRINGING SOCIAL EQUITY TO THE
FOREFRONT

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ABSTRACT

ASSESSING FLAGSTAFF'S LOCAL FOOD SYSTEM RESILIENCE: RECOMMENDATIONS FOR BRINGING SOCIAL EQUITY TO THE FOREFRONT

BY: BROOKE FREEMAN

Food in the US is controlled by a few companies that are putting profits over people and the environment. This dominant system is predicated on agriculture that uses large amounts of water while degrading the soil by using chemical pesticides and fertilizers. The increasing awareness of the downfalls of highly mechanized agriculture production has sprouted alternative food movements that focus on smaller production with environmental health a top concern. However, within the past several years these movements have been criticized for failing to consider social equity. Principles within agroecology, food security, food justice and food sovereignty aim to acknowledge the racial conditions of food access and health. The racial conditions of minority groups are ridden with disinvestment and violent histories that result in food deserts. Uncertainties associated with climate change will require a holistic approach to alternative food movements that balances environmental health and social equity.

The southwest particularly will see severe water shortages resulting in unknown consequences to the national and global food network. This threat calls for cities such as Flagstaff to become more self-sufficient in food production. Resilience theory situates this study in bringing together agroecology, food justice, food security, and food sovereignty in an analysis of Flagstaff's local food system. This study aims to analyze the resilience of Flagstaff's food system by looking at local growers and the organizations that are supporting them. My research identifies the need for supporting more distribution efforts to low-income groups in addition to the need of diversifying the growing community in general. The Hispanic and Indigenous groups

within Flagstaff have been largely left out of the small growing community. If Flagstaff is to support more growers, these populations need to be considered both as producers and consumers. This research is limited by not looking at the community gardens within Flagstaff and recommends this in future research as little research has been done on food production in Flagstaff. The research has brought seven main recommendations for Flagstaff to increase food system resilience.

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Chapter 1. Introduction

Food is necessary for life. However, the current dominant food system presents problems to the health of people in the United States (US) as well as the environment. Industrial agriculture is the result of the green revolution in which agriculture has become increasingly automated using machinery and chemicals that permit the vast scales at which produce is grown (Vogt et. al, 2010). Large industrial farms are often called monocrop farms in which a single crop is grown across a large amount of land (Alkon & Agyeman, 2011). The lack of diversity in what is being grown across the US at industrial sized scales is narrowed down to a handful of crops, with corn and soybean being the most widely grown (Hauter, 2012). Additionally, the crops that are being grown are in large part not even going into the mouths of US people and when they are, it is in the form of highly processed un-nutritious foods. For example, corn is largely used to produce ethanol as a gasoline supplement to keep prices low or in the creation of sugary syrup additives (Hauter, 2012; Vogt et. al, 2010). The industrial production of food has detrimental effects on the environment leaving soils, water, and the air polluted (Dixon et al., 2009; Hauter, 2012; Sabo et. al, 2010). This environmental degradation coupled with the fact that highly processed unhealthy foods are most widely available to US citizens is a direct result of consolidation within big agribusiness (Hauter, 2012; James and Friel, 2015).

Consolidation of agribusiness and government policy has created a concentration of power over what is produced (Berardi et. al, 2011; Hauter, 2012, Imhoff, 2007). Consolidation and the influence of businesses on regulations has even seeped into the production of organic produce (Hauter, 2012). A handful of agribusiness have the power to sway policies in their favor to continue to exploit the environment and health of people living in the US. There are a lot of

factors at play within industrial food production in the US that include, but aren't limited to, racial health disparities, environmental degradation, climate change, and the separation of rural and urban spaces. Each of these issues will be briefly discussed below.

The access of minority and low-income populations to healthy food remains an especially important issue in the US. The influence agribusiness has on people of color is directly related to the racial histories in the US (McClintock, 2011). The US is predicated on race to function largely because the country was founded on capitalist values that favored white control over the economy. The histories for people of color in the US are defined by pernicious forms of segregation and stealing of land (Wolfe, 2007; Sugrue, 2014). People of color and the places in which they live have been excluded from capital of all kinds, mainly infrastructure, influencing job availability. Additionally, homeownership has been largely stripped from the rights of people of color which also affects outside investment into communities (McClintock, 2011; Sugrue, 2014). People of color have been denied investment and housing access due to perceived criminality (Freund, 2010). Each of these factors, disinvestment, lack of jobs, and the overall avoidance of communities of color have resulted in lack of access to fresh healthy foods. The main sources of nutrition for people of color, especially those living within inner cities, is narrowed down to convenient store selections or fast food (McClintock, 2011). The term to describe the areas within cities that lack proper grocery stores and food options is "food deserts" (Anderton-Folmer, 2013; Babb, 2013; McClintock, 2011; Shaw, 2006). Food deserts largely affect low-income people of color and is a direct result of how the US functions under capitalism: grocery stores make more money in high-income areas and open stores to maximize profits.

Environmental degradation and climate change also increasingly threaten the current food system. The use of fertilizers and pesticides degrades soil nutrients perpetuating a never-ending cycle of chemical inputs and associated pollution in water and air (Sabo et. al, 2010). Agriculture will be one of the hardest hit industries by climate change (IPCC, 2014; USGCRP, 2017). Industrial agriculture irrigation is one of the largest users of water in the world (Fischer, 2007). The southwest, including Flagstaff, is marked by increasing threats to water availability as climate change brings longer droughts and higher temperatures to the region (Day, 2013). Extended droughts put pressure on the main reservoirs from the Colorado River such as Lake Mead. As Lake Mead continues to drop, Arizona will be one of the first states to be cut off from water supplies through the Central Arizona Project (Davis, 2017; Elliot, 2018). This threat to water supplies jeopardizes the food security of places like Flagstaff in which most of the food is imported from other areas of the southwest. Additionally, drought brings with it a multitude of environmental concerns. Drought increases the likelihood of flooding when precipitation does occur threatening aquatic life and biodiversity (Sabo et. al, 2010). Climate change and environmental degradation are both important in the industrial agriculture conversation.

Lastly, the rise of industrial farming methods has created a distinct separation between urban and rural spaces. This separation indicates that rural spaces are for growing food to then be transported to urban spaces where most people live (De Schutter, 2010; James and Friel, 2015). Historically, cities have been able to survive in times of crisis because of local agriculture (Barthel & Isendahl, 2013; Barthel et. al, 2015; Reynolds, 2010). Gardening during WWII was necessary for many communities across the US because of limited resources coining the term “victory gardens” (Reynolds, 2010). Many places have been able to survive and thrive because of

local food production making it a viable alternative to the industrial model of production and the harmful nature of industrial methods.

The persistence of cities surviving amidst threats to food security based on local food production is a direct example of resilience. Resilience describes a systems ability to withstand threats or disturbances (Folke, 2006; Walker and Salt, 2006). Resilience theory can be both positive and negative. For example, the resilience of alternative food movements has been described as ensuring social and gender equality (Schipanski et al., 2016). However, the resilience of industrial food through policies such as the Farm Bill that supports industrial endeavors over sustainable ones (Berardi et. al, 2011). Put more generally, alternative food movements can be resilient towards creating change and adaptation within a system and the industrial food system is described as resilient to changes.

Flagstaff has a unique geography making the city especially susceptible to food security threats. First, Flagstaff is in the southwest which has a dwindling water supply under climate change (Day et al., 2014). Second, there are only two main highways bringing in most of food to the city. It is said that if these highways were cut off that Flagstaff would only have a few days of food on its grocery shelves (Marbury, 2017). Third, there is a small amount of local food production happening within and around the city. Each of these factors challenge the sustainability of Flagstaff's food system and call for an increase of local food production to ensure the viability of residents' future. More local food producers are needed within and around Flagstaff. In addition, issues related to social equity and food access are also important to address to ensure access to adequate and healthy food for all Flagstaff residents.

Various terms make up the alternative food movement which aims to combat industrial food. Local food has become one of the main characteristics of alternative food movements. However, the alternative food movement itself has been largely criticized for being elitist and including only white middle-class people (Alkon and Agyeman, 2011). There are scholars that describe “the Local Trap” which indicates that local does not inherently mean good or socially just (Born and Purcell, 2006). This criticism of local alternative food movements reveals the importance of critically analyzing local food itself within any given city or region.

The food justice movement has become the forefront of alternative food conversations to ensure that local food production is socially just and includes low income people of color (Alkon and Agyeman, 2011). When people of color are able to control the food that is available to them, food justice is achieved (Alkon and Agyeman, 2011). Additionally, the Community Food Security (CFS) movement has been used to describe similar goals (Babb et al., 2013; Reynolds, 2010). CFS started out of food assistance programs in the 1990s and has evolved to ensuring community access to culturally appropriate foods (Reynolds, 2010). Food sovereignty has also been used within alternative food movement work and aims to focus on the regaining of power over one’s food system focusing on ensuring that people of color are have control over their food (Mares and Peña, 2011). Food sovereignty goes beyond access and dives deeper to include the consideration of land relations and decision making that cultivates sense of place and personal identity around food (Mares and Peña, 2011). Each of these movements, food justice, CFS, and food sovereignty have come to make up the broader alternative food movement working towards social justice and healthy food access.

Although there has been extensive work on alternative food movements, local food, and resilience separately there has been little work bringing these concepts together to analyze a specific city's food system. Some of the work that has been done looking at food system resilience is not within the context of US cities and the work done within US cities does not explicitly bring resilience theory into the conversation (Schipanski et al. 2016; Reynolds and Cohen, 2016; Quizar, 2014). My research specifically looks at Flagstaff's local food system through a resilience lens while critically applying and arguing that food justice is an important piece to the puzzle of overall food security. Resilience theory has been criticized for not adequately addressing social aspects of a system and the power structures behind social components (Stuart, 2016). Additionally, research concerning local food production approaches such as agroecology, identify a lack of analysis for social components (Lamine, 2014). My research will contribute to the current literature by ensuring social concerns are addressed in thinking about food security and overall food system resilience. The argument that situates my research is that no system, food or otherwise, can truly adapt and function amidst threats if social justice concerns are not being taken into consideration. The work that has been done on Flagstaff's food system has either looked at agricultural histories, personal gardens, or assessing the needs for local food (Emmons, 2012; Hartwell, 2011; Local FARE, 2011). My work will broaden the knowledge and analysis that has already been done on Flagstaff's food system to form recommendations for a thriving local food system. Thriving in this sense means a food system in which people who want to grow for a living can despite their socioeconomic status and that locally grown food is affordable and available to all in Flagstaff community.

The strategy for obtaining a thorough analysis of Flagstaff's food system resilience in this thesis will be done by looking at local food producers and the organizations that support them. In this research local food producers are defined as farms that are located within Flagstaff city limits and within a 60-mile radius of city limits. Organizations within this research include both non-profit and governmental entities that have an influence on the success of local food efforts. The questions asked in my research include a specific focus on land access, costs of starting and maintaining a farming practice, and food access distribution efforts while also looking at how different organizations across town have helped supplement those costs through different grant programs. Thus, my research is aiming to look at both how local food is being grown in Flagstaff and who it is going to. The main method of my research is interviews with local food producers and organizations. A secondary component of my research is looking at previous work done on Flagstaff's local food system including the Local Food Assessment (2011) that highlights the need and demand for local food in Flagstaff and history of agriculture in the Flagstaff region. Thus, the primary question of my research is:

1. What does food system resilience look like in Flagstaff and what are recommendations for supporting and expanding local food production?

This question will allow me to identify both strengths and weaknesses in the current local food system in Flagstaff to allow for recommendations for growing food system resilience through a focus on social factors. The accompanying questions that fall under the primary research question are:

- A. Where is current local food production in and around Flagstaff? And why?

What are the tradeoffs, barriers, and constraints of urban vs. periphery production?

- B. Where are local growers distributing their produce? To whom and who is missing?
How is socioeconomic status related to both growers and consumers?
- C. What are the scales of production for various growers in and around Flagstaff?
How does scale relate to location based on barriers to land access?

This research focuses on what programs have supported farming efforts while also analyzing some of the deeper workings of local farms by asking about customer bases and distribution of food into the community. My work will be useful to growers and local organizations' growers. Many growers stated that they are so busy that connecting with other growers in town is often limited. Results will be shared with growers to increase knowledge of local production and foster collaboration. The most useful application of my research is for both growers and organizations to take a critical look at what they are doing and see ways in which they can possibly change what they are currently doing to achieve a more resilient local food system. This will make it easier for growers to start increasing local food production and bring an array of local, cultural, and historical knowledge to the conversation about local food.

This research is invaluable to my future work after completing the Sustainable Communities program. I am passionate about supporting food systems that are socially just. Through some of my own experiences I have seen a lack of food access for people of color. Growing up within the suburbs of Kansas City, Missouri I was not aware of food access issues until coming to college and with working at a local health food store in which most of the patrons were wealthy white residents. I couldn't help but question the systems behind the healthy food

I had such easy access to as I went to school passing through the downtown area with some of the most disinvested areas of the city. The questions I had about disinvestment and how one street could literally divide a city between people of color and white residents and how these areas so close together could look so drastically different were answered in one of my introductory to planning classes. In this class we talked about the racial nature of how cities are organized. My professor being extremely passionate about his work, often ranted about the historical policies that have shaped our cities and ridden them with inequity. This class is one that sparked my further interests and quest for a more just organization of life for people just trying to live in a society that is constantly working against their well-being. Upon coming to the Sustainable Communities program, I then started to connect the racial histories of the country with how disinvestment in communities of color then influences food access and ultimately health. My future work will forever be rooted in my experiences both working at a health food store, my undergraduate planning class, and my course work in Sustainable Communities. This thesis is the fruits of all that labor and hard thinking. It easy to say that my future work will flow organically from this research just as this thesis has flowed from all my experiences both personally and academically. I will forever be analyzing how my work towards resilient food systems is influencing and interacting with those most disenfranchised by the dominant food system whether I am doing non-profit work or starting an urban farming practice.

Chapter 2. Theoretical Framework

*“The recent volatility in food commodity prices, however, is a warning that the globe’s food supply systems are not infinitely elastic. There have been changes in normal demand due to the unintended consequence of bio-fuel policies that were diverting the use of food crops for energy. This illustrates how sensitive both subsistence and intensive farming systems can be to external shocks. It also highlights the fact that global food supplies are not secure even today, despite the increase growth benefits that resulted from the Green Revolution”
(Vogt et. al, 2010, 239)*

2.1 Introduction & Resilience Overview

I used a resilience theory approach to frame my study and guide my thesis research and analysis. This chapter will start by describing resilience theory in general. I will then illustrate how resilience has been applied to both industrial and alternative food systems. I will then describe how I intend to use resilience within my research and specifically in the analysis of my data.

Resilience theory was originally used in ecology studies but has been gaining traction in analyzing social ecological systems (Cote and Nightingale, 2012; Stuart, 2016). Resilience refers to a system’s ability to respond and adapt to disturbances while maintaining the same function (Folke, 2006). This theory comes with an emphasis on threshold awareness and uses a ball in trough analogy to illustrate how systems can change states and adapt while maintaining the same overall function (Walker and Salt, 2006). The depth of the trough represents a system’s level of resilience while the ball represents the system of interest. When the system is disturbed the ball moves within a trough. However, if the trough is not deep enough amidst the disturbance the ball will move into another adjacent trough. This move means that the system no longer serves the same function and thus was not resilient enough to withstand

disturbances and maintain its function at the same time requiring the system to shift into a new state of being (Peterson, 2000; Schipanski et. al, 2016).

There are several ways in which resilience theory can be applied to a system. Walker and Salt (2006) point out that there is general and specified resilience: the first is when you know what the stressors to a system will be and the latter is when there are unknown stressors. Adaptive cycles within the resilience framework refer to how a system can maintain its function when facing disturbances (Folke, 2006; Walker and Salt, 2006). This concept is especially useful when looking at social ecological systems including food production systems. For example, in the wake of climate change, Arizona faces decreasing water availability and there are both known and unknown stressors and consequences.

Because it is known that Arizona will be facing these changes, resilience theory becomes highly applicable to Flagstaff's food system. Flagstaff gets most of its food from other areas and regions, Phoenix being one of them. Phoenix agriculture will be specifically susceptible to water stresses due to climate change and expected cuts to water available through the Central Arizona Project (Davis, 2017). This stress will also be transferred to the Flagstaff food system creating pressure for more local food producers. Resilience in this research is referring to the possibility of Flagstaff's food system to be both ecologically and socially resilient to climate change and water impacts. This will call for a more localized sustainable approach that weighs natural and social concerns equally referring to best farming practices as well as just distribution and attention to what social groups are producing food. growers

2.2 Resiliency of the Industrial Food System

Resilience can be a positive or negative attribute depending on the desired traits in a particular system. For example, the status quo industrial farming model in the US has been extremely resilient in a sense that modes of production focused on high efficiency and high profits limit a farmer's ability to practice alternative modes of production. The industrial food system is resistant to change and continues to result in economic gains for some (mostly corporations) while most others are experiencing negative social and environmental impacts (Berardi et al. 2011). Powerful actors in the dominant industrial food system also continue to constrain the development of more socially and environmentally just alternatives. When talking about the industrial food system it is important to note how neoliberal ideology has shaped this system. Neoliberal ideology became deeply embedded in the US capitalist economy in the 1980s and has resulted in the rise of economic disparity in the 1980s (Harvey 2005, Iber and Konczal, 2016). According to Polanyi (1944), market expansion associated with neoliberalism shifts the economy from being embedded in social systems to social systems being embedded in the economy. In this system, economic growth is the prioritized goal which undermines other important goals in society related to social and ecological well-being. Under neoliberalism the market is perceived to provide the answers to any issue (Reich, 2015). The industrial food system functions based on neoliberalism and is focused solely on economic efficiency (Berardi et al, 2011). Largely because other alternatives have been dismissed, neoliberal ideology itself has proven to be extremely resilient as the basis of all social and economic activity in our current capitalist system (Iber and Konczal, 2016; Reich, 2015).

The Farm Bill is one of the most pervasive pillars supporting the industrial food system. Berardi et. al (2011) points out, “These bills stabilized extreme economic situations but neglected to address any other underlying social and environmental factors, inevitably weakening the overall resilience of the system to disturbances such as price hikes in energy or other costly external inputs” (p. 117). This quote shows how the resilience of a system is dependent on intended outcomes. The Farm Bill has become resilient towards creating economic stability for the few corporations running food production. However, the bills have destabilized the overall resilience of the food system as a whole. The Farm Bill was originally created during the great depression to aid growers in a time where the food security of the nation was threatened (Berardi et. al, 2011). Thus, the Bill was built out of creating short term financial stability within the food system (Berardi et. al, 2011). Today, the Farm Bill has evolved to support large scale monocrop operations over any other form of food production (Imhoff, 2007). This is seen through the government subsidies that go towards large-scale and chemically intensive production, the majority of which are producing crops that are used for ethanol, livestock feed, or heavily processed foods (Born & Purcell, 2006). These subsidies limit farmer’s options because of the high cost of production in general. Farming often requires a large upfront investment if the operation is not passed down from family members. Thus, growers have an imperative secure funding and subsidies are one of the main ways farms are funded. However, these subsidies come with strings attached and end up dictating the types of crops and practices a farmer can practice. Additionally, the Farm Bill is extremely lengthy and hard to comprehend for regular citizens which restricts the power of citizens to have a say in what goes into it (Imhoff, 2007). Thus, the Farm Bill limits how growers manage and ultimately

adapt their farms because it is structured to support large-scale industrial models of food production.

There have been some environmental initiatives under the Farm Bill that include the Environmental Quality Incentives Program (EQIP) that runs under the US Department of Agriculture (USDA) and aims to help growers adopt conservation practices on their farms or ranches (Gentry, 2013; Hauter, 2012). However, conservation programs only account for 8% of total funding (Berardi et. al, 2011). Hauter (2012) explains that most of the EQIP funding has gone to subsidize factory farms and large livestock productions. Hauter (2012) goes on to state that between 2002 and 2007 over half of EQIP funding went towards large livestock productions, mainly manure management. Some of this biased funding from the federal government is creating gaps in support for local food producers while maintaining a seemingly helpful front (Gentry, 2013). Additionally, these programs are voluntary and non-regulatory (Berardi et. al, 2011). Despite a few environmental and social programs, the structures of the Farm Bill itself are very resilient to change by ensuring most support goes to large production models.

Corporations have increasingly been able to control the food system. The dominant food system is extremely corporatized: corporations control what practices growers must perform through their contracts as well as how food is distributed, marketed, and sold (Hauter, 2012). The increase in corporate power over food production is a result of mass consolidation within all aspects of food production including seeds, fertilizers, processing, and grocery store chains (Hauter, 2012). This consolidation allows for only a handful of companies to have control over most of food production within the country. This consolidation and control has also spread

into organic products as well (Berardi et. al, 2011; Hauter, 2012). Berardi et. al (2011) discusses the increasing frequency of agricultural disturbances and how they are related not only to climate change impacts and the lack of scale and crop diversity. Smaller scale productions are more likely to participate in conservation practices and the planting of many crop varieties (Berardi et. al, 2011). Increasing stressors like climate change will challenge the resilience of the industrial system and increase the need for more local and alternative sources of food.

2.3 Resilience and Alternative Food Systems

The concept of resilience can be applied to food systems in multiple ways. For example, King (2008) applies resilience to food systems in three different models. The first model is engineering resilience in which efficiency is the focus: this model can be applied to conventional agricultural systems (King 2008). The next model is ecological resilience which is concerned with persistence in the wake of a disturbance or how much a system can absorb shocks while maintaining its function. This model can be applied to organic production, CSAs, and Farmer's markets (King, 2008). The last model, adaptive capacity resilience, looks at a system as cyclical and emphasizes learning and generating options in a non-equilibrium state. This model has been applied to biodynamics, permaculture, and community gardens (King, 2008). Ecological resilience and adaptive capacity are the most applicable to Flagstaff's local food system. Ecological resilience is displayed in the way local growers apply season extenders on their farms to ensure their crops can survive extreme weather events in addition to how they water their crops. Ecological resilience can also be applied in how growers are distributing their produce to the community whether it is through CSAs or farmer's markets. Adaptive capacity is seen

through attention to historic farming practices in the region and an emphasis on social diversity in terms of local food production and distribution.

Historically, agriculture within cities have been a crucial aspect of city vitality and survival. For example, Constantinople endured almost a decade long siege because of its extensive agriculture system within the city walls (Barthel & Isendahl, 2013). Although many argue diversity in food networks is important, local food production has been key to many cities survival under disturbances and instability (Barthel & Isendahl, 2013; Born and Purcell, 2006). There is a need to resituate agriculture as an embedded part of city function and bridge the rural urban divide (Barthel & Isendahl, 2013; De Schutter, 2010). Two cities with groups working to bring food cultivation back to the city are New York and Detroit. Efforts in these cities illustrate how people are working to bring the food system back into the hands of citizens to provide food security and overall food system resilience (Reynolds and Cohen, 2016; Quizar, 2014). When agriculture becomes a part of the city, it allows for resilience across both social and ecological realms because it directly connects people to each other and to their environment through the cultivation of food. This offers food security as well as closer ties between people and their food.

Scholars who have applied resilience to alternative food systems have identified specific factors that can increase or decrease food system resilience. Schipanski et al. (2016) argues that there are several factors that can transform or destabilize a system's resilience. Equity and justice, biodiversity through agroecological management, increased diversity of distribution networks, increased dietary diversity, and reduced waste can all increase a food system's resilience (Schipanski et al., 2016). On the other hand, characteristics such as inequity, reliance

on global distribution, and external inputs can degrade food system resilience (Schipanski et al., 2016). This framework can be illustrated through the ball and trough model of resilience (Figure 1). The wedges in this depiction represent factors that can either build or decrease a system's resilience.

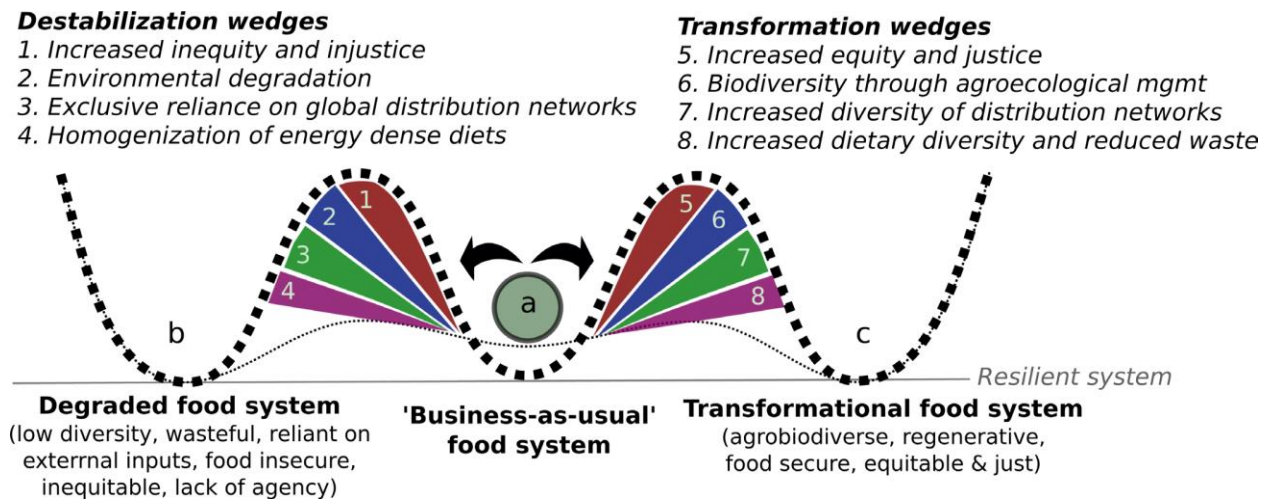


Figure 1. Ball in trough model of alternative food system resilience (Schipanski et al., 2016).

Local food production and the various ways of practicing it are rooted in the drivers that build resilient food systems. Local food can increase food security and food justice when agroecological health, equal distribution, and dietary diversity are the main goals. There are few studies that use resilience theory to directly analyze modern day local agricultural systems and most focus on community gardens and urban agriculture (Anderton-Folmer, 2013; Barthel & Isendahl, 2012; Reynolds, 2010; Schipanski et al., 2016; Walker, 2014). Additionally, in these studies food justice is not tied to food system resilience and food security is only loosely tied to food system resilience through accessibility claims.

2.4 Resilience Application

My line of inquiry aims to look at the potential of local food production to contribute to resilient food systems within cities through food security and food justice pathways. Thus, I aim to work towards linking resilience to food security and food justice within a local food production framework. I analyzed Flagstaff's local food system focusing on ecological resilience and adaptive capacity. I will assess how growers have been successful in Flagstaff or what has contributed to their resilience. I will also examine how organizations are supporting growers and the local food system as a whole to increase their capacity to adapt to environmental and social changes. Focusing on the resilience and adaptive capacity of the local food system in Flagstaff will allow me to make recommendations to increase future food security.

Figure 2. Basic conceptual framework created to display components of a balanced resilient food system in Flagstaff where ecological and social vitality are equally weighed.

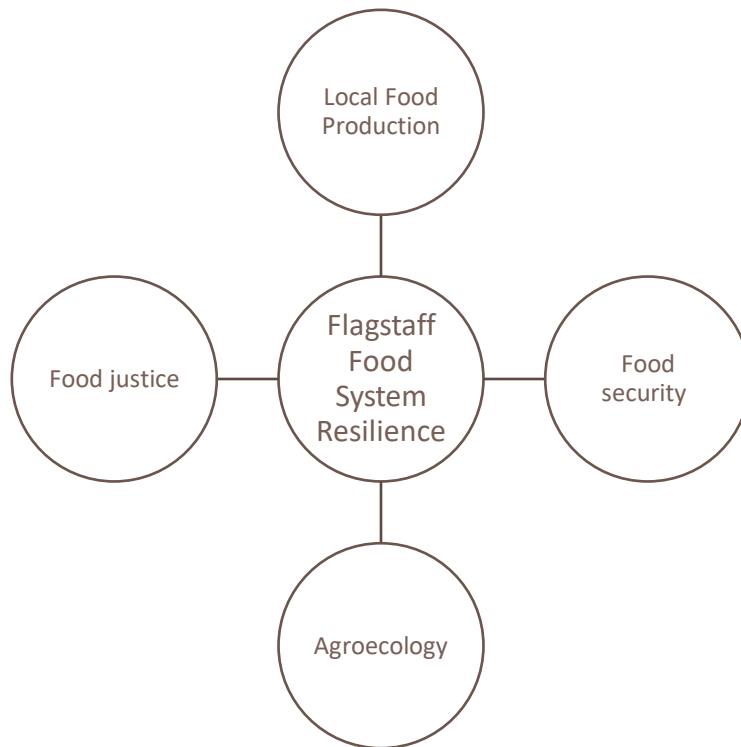


Figure 2. Framework for the study

My study assumes that resilience of a food system is rooted in equal attention to social justice, food security, and agroecological concerns (Schipanski et al., 2016). However, it is also clear that there are negative ways in which resilience can play out as it does in the industrial food system. By knowing some of the characteristics that can build and destabilize a system's resilience, I can analyze how resilience is playing out in Flagstaff's local food system.

Chapter 3. Literature Review

3.1 Introduction

This chapter highlights ways in which local food production can contribute to a city's overall resilience, how the decline of social resilience has occurred in cities, and examples of cities that are demonstrating increased resilience through community gardens. Most of the current literature relating local food production and social equity is focused on community gardens in general. My literature review section will focus on community gardens although my study is focused on local growers in Flagstaff. Little literature has been done linking local food production (small farms) directly to resilience and the work that has been done uses community gardens. Because the literature is limited in this way, my literature review will also be limited by focusing on community gardens and not small local farms. I have found it important to weave resilience into the section headers because the theory is central to my research. I wanted to ensure that resilience theory could be seen throughout this review as I analyze both current and historical events. There are two sections within my literature review, the first is the *Utility of Local Food Production* which focuses on reasons why local food production is an important and relevant response to industrial agriculture. The second section of my literature review is *Food, Race, and Power* which dives into the history and realities of food related social injustices within the US.

3.2 Utility of Local Food Production

This section will briefly discuss what the literature has presented as the benefits of local production of food and arguments for a local food production model within Flagstaff. The main arguments within this section are focused on how local food production supports social ecological systems in response to industrial food production and climate change. This section will also look at how agroecological practices can be incorporated into farming to bridge the human-nature divide found in large-scale industrial farming models. Lastly, I will discuss how small local farms can support local economies. Overall, this section will relay the need and utility of small local farms in response to industrial agriculture.

In terms of resilience, local food production has social and ecological benefits. Local food production creates the opportunity for environmentally sound practices because the local food model is not at a large monocrop production scale. This provides diversity in what is grown and often uses more biological inputs as opposed to chemical inputs (Berardi et. al, 2011). Vogt et. al (2010) explains how food security can be addressed with smaller farming practices when ecosystem constraints are factored (climate, soils, etc.). Vogt et. al (2010) states, “Humans have been very good in acquiring high plant productivities from a smaller land-base” (p. 264). Additionally, local food production provides a space in which strong connections can be made with the community through unconventional distribution methods such as farmer’s markets, CSAs, and farm to restaurant models (Stone, 2016). These community connections create spaces for learning about the importance of local food itself. Local food can also provide food security in the wake of system disturbances at a larger regional scale (Day et al., 2014). Overall,

increasing local food production makes sense for Flagstaff because of the expected disturbances of water availability and climate change that threaten the system.

Climate change and agriculture are closely tied. Industrial agriculture is a large contributor to climate change through greenhouse gas emissions (Dixon et al., 2009). Not only does industrial agriculture rely heavily on fossil fuels for production and distribution but it is also presented as a 'fix' to dwindling oil reserves through biofuel production (Weis, 2010). Additionally, the efficiency of large industrial farms will be challenged by climate change as the decrease of fossil fuels increases the cost of food. (Day et al., 2014; Weis, 2010). The issues surrounding biofuels are related to increased food pricing and a continuation of problematic industrial farming methods that rely on the energy source they are trying to supplement (Weis, 2010). Biofuel production is energy intensive and inefficient, failing to address issues surrounding oil consumption (Weis, 2010). Agriculture will be heavily affected by climate change, especially in the southwest where water supplies are dwindling (Day et al., 2014). More sustainable approaches to agriculture can mitigate climate change, this includes more local production at smaller scales and using less chemical inputs (Berardi et. al, 201; IPCC, 2014; USGCRP, 2017). As more disturbances arise there will be a need for more adaptive and diverse practices that smaller farms offer (Berardi et. al, 2011). The various effects of climate change that influence agriculture are largely attributed to water scarcity resulting in stressors on soil and yields (Day et al., 2014; Dixon et al., 2009). Overall, climate change is a significant threat to the current "status quo" industrial production model calling for the need to have more local and smaller scale food networks.

Agroecology is emphasized in the local food literature to increase food security and adaptive responses to climate change. Agroecological systems have been defined as systems that bridge agricultural production and natural environments (King, 2008). Agroecological practices involve increasing crop diversity as well as the use of drought tolerant varieties which both contribute to farm resilience (De Schutter, 2010). Additionally, an agroecological approach includes less reliance on fossil fuels (De Schutter, 2010; Tornaghi, 2017). An agroecological approach to food production is successful when knowledge is shared amongst growers as opposed to more bureaucratic models of organization (De Schutter, 2010; Pimbert, 2018). Critics of an agroecological approach argue that the method only focuses on localization and agriculture-environment relationships rather than socio-ecological complexities (Lamine, 2014). However, others have rooted agroecology in local food production where social complexities are addressed (King, 2008). An agroecology approach acknowledges the link between humans and nature and fosters a symbiotic relationship between the two. When thinking about local food production, it is key to understand these systems as coupled in which humans and nature are both co-evolving together (Norgaard, 2006).

Local food production also supports the local circulation of capital within a city. Local economies offer a way in which a community can satisfy its needs without importing or exporting goods (Berry, 2003). A study in Reno, Nevada showed that if just 1% of vacant land was used for food production, millions of dollars could then be circulated into the local economy while providing citizens with access to healthy foods (Anderton-Folmer, 2013). Additionally, local food production is an endeavor in which community members are consuming the food grown in their cities. This nearly eliminates food miles all together. Gentry (2013)

points out that more support for local producers from Community Based Development Organizations (CBDOs) also creates jobs. This not only builds the tax base of a city but allows for more capital to be circulated within a community. Local food production builds local economies and ensures that capital stays within a city as opposed to industrial food production that circulates capital out of cities to large corporations (Hauter, 2012).

3.3 Food, Race, and Power

Food is essential for life. However, fresh foods are not readily available for many communities of color across the US (Gentry, 2013). The reasoning for this is not as simple as blaming poor infrastructure and deteriorating neighborhoods. These neighborhoods, ridden by food deserts, are fixed in the deep history of the US. The urban reality of food access can be dated back to civil rights era struggles for housing and the deindustrialization of inner cities (Alkon and Agyeman, 2011; Heynen et. al, 2012). This history has excluded people of color from being able to easily obtain property and thus has resulted in disinvestment in neighborhoods that contain mostly residents of color. Disinvestment results in many disparities and hardships for residents, three of the most prominent of these disparities are jobs, housing, and food access (Heynen et. al, 2012; Sugrue, 2014).

Flagstaff's population is primarily white, however Hispanic, and Indigenous groups make up most of the minority population and are an important part of the community (Data USA, 2015). Racial realities of these two minority groups in Flagstaff are situated by the broader racial histories of the US. This section will analyze food access in neighborhoods of color and compare it with the historical rise of racial capitalism in the country. The section will then go on to discuss some specific terms that define movements to combat oppression. Lastly, the section

will look at two cities, Detroit, and New York, to see how groups are creating viable alternatives to a system that has largely left their needs out of the equation. The goal of this section is to focus on people of color living in cities and how their relations with land and food have been shaped by the histories of this country and how they are combating oppressive forces through community gardens.

Historically agriculture has been an integral part of city life and function. However, with the rise of corporate power in our society and specifically agriculture, farming has become ever more separated from the city. This creates a division between rural and urban spaces in which the two cannot conceptually overlap within this system (De Schutter, 2010). The country has been through cycles of increasing and decreasing urban agriculture throughout history, with marked increases in urban agriculture during times of war and economic instability (Barthel & Isendahl, 2013; Reynolds, 2010). In response to a multitude of issues associated with the industrialized food system, urban agriculture has taken hold in many cities across the US such as New York and Detroit (Reynolds & Cohen, 2016; Quizar, 2014). Alternative food movements have been growing in popularity in recent years; however, industrial food remains the most widely available to citizens because of corporate control over the food system (Hauter, 2012).

Alternative food movements have been criticized for remaining as socially unjust as the industrial system, supporting mostly white upper-middle class people who are able to afford the luxury of locally sourced food. However, there are others that argue that food justice movements in conjunction with food sovereignty provide opportunities to combat this exclusion in meaningful ways through an agroecological approach (Mares and Peña, 2011;

Pimbert, 2018). Community garden movements can provide a space for people to control the food they produce and consume in a way that simply going to a farmer's market cannot. These initiatives provide more than a market fix to the deeper issues within the dominant food system by taking power back into the hands of communities (Alkon and Agyeman, 2011).

3.3.1 History of Exclusion-The Destruction of City Resilience

Capitalism in the US is highly racialized and defined by white control over the largest proportion of capital. The roots of capitalism are based on land which can date back to the work of John Locke (1689) in which he argued for private property and land productivity through worker exploitation. Locke's (1689) arguments were based on the idea that land could only be productive or useful if it was privately owned and being worked. Enclosure of the commons in England started a movement for private control over land itself (Wood, 2002). As Europeans came to the US this ideology eventually became the basis of the American dream (Wood, 2002). The dream of owning land in the US resulted in the violent stealing of land from both Native American and Hispanic populations (Lipsitz, 2007). Success in the US is based on what you own. This basis of capitalist culture deems things necessary to survive, such as food and housing, not as a basic human right but something to be bought and sold in the market (Willse, 2015; Wood, 2002). Racial Capitalism, a term coined by Cedric Robinson cite, explains the very relationship and evolution of capitalism as a racist function. This term can explain how racial hierarchies have come into existence for the sake of the colonial takings of land and people for economic gain (Kelley, 2017).

Before discussing food movements, it is important to discuss how areas have become food insecure from historical policies that impact people of color. Colonial policies enacted at

the start of the US were focused on the stealing of native land and the appropriation of native cultures and practices (Wolfe, 2006). Policies such as the Dawes Act of 1887 broke up communal tribal lands and allocated individual plots to be owned and cultivated in untraditional European ways (Dunbar-Ortiz, 2015; Wolfe, 2007). Agriculture is one the main reasons for taking native lands because of its ability to support the US economic sector coupled with the need for permanent plots of land (Norgaard et. al, 2011; Wolfe, 2007). The violent removal and allotment of native lands have been taking natural resources from and segregating native communities since the 1800s (Dunbar-Ortiz, 2015). This type of removal resulted in the appropriation of many native groups in which they could no longer practice traditional ways of hunting and gathering for food (Gurney et. al, 2015). Other policies are centered around housing and through redlining and restrictive covenants have intentionally racially stratified cities (Gottsdienner, 2013; McClintock, 2011; Sugrue, 2014). The Federal Housing Administration (FHA) favored funding for white flight out of inner cities, which left mainly African American and Hispanic low-income groups behind in declining city centers (Lipsitz, 2007; Sugrue, 2014). These families could not afford, nor were they legally allowed to move into the suburbs because of oppressive policies such as redlining (Gottsdienner, 2013; Sugrue, 2014). This exclusion restricted job opportunities as cities deindustrialized ultimately decreasing jobs for people of color (Sugrue, 2014). This sequence of events lent itself to a focus of capital in suburbs leaving the inner cities to ultimately decay in many cases.

Exclusion and segregation have lent itself to what Lipsitz (2011) deems both the “white spatial imaginary” and the “black spatial imaginary”. Both the white spatial imaginary and the black spatial imaginary developed out of the histories of the US. Segregation is what Massey

and Denton (2003) say is the missing link in discussions of understanding poverty. Thus, the realities of people of color are deeply shaped by the actions of white people in which changes in socioeconomic status of people of color has little to no effect on segregation itself (Massey and Denton, 2003). Spatial imaginaries are used by Lipsitz (2011) to describe how race influences societal behaviors ultimately shaping spaces within cities. The white spatial imaginary perpetuates segregation because it is focused on economic individualism. Alternative movements are based in the black spatial imaginary and based on collective efforts to solve problems (Lipsitz, 2011).

The white spatial imaginary includes a perceived criminality towards African Americans which is the basis for supporting racially segregated cities even in a time where segregation is illegal (Lipsitz, 2011). This imaginary provides the basis for arguments that racially integrated neighborhoods would drastically sink property values (Freund, 2010). Thus, policies and even violence were permitted based on the idea that if African Americans were to move into a more affluent white neighborhood the neighborhood itself would decline. The FHA paid no attention to whether African American families could afford to live in an area and instead used redlining and restrictive covenants to keep neighborhoods segregated (Freund, 2007; Gottsdienner, 2013; Lipsitz, 1995; Lipsitz, 2011; Sugrue, 2014). The white spatial imaginary is rooted in an individualist ideal of control over capital because of the specific power whiteness lends (Lipsitz, 2011). White reasoning for urban decay and declining African American neighborhoods would say that it occurs because of African American behavior not public policies or the deeper racial histories of the US (Freund, 2007). Lipsitz (2007) states, "Not all people who are white consciously embrace the white spatial imaginary, and not all whites profit equally from their

whiteness, but all whites benefit from the association of whiteness with privilege and the neighborhood effects of spaces defined by their racial demography” (p.13). This quote shows how these spatial imaginaries are used to describe race relations in the US and how they can be fluid in their application. Food security for Native groups have been threatened because of many of the policies that took away their cultural practices (Gurney et. al, 2015).

On the other hand, the black spatial imaginary provides an alternative outlook based out of necessity. The black spatial imaginary has emerged out of exclusion requiring African Americans to have much different relationships with land that emphasizes public participation and solidarity (Lipsitz, 2011). This imaginary occurs because of exclusion from jobs, housing, and even food (Lipsitz, 2011). Urban renewal which physically wiped out neighborhoods of color to create extensive highway networks segmented what was left of neighborhoods of color. Segmented neighborhoods are dangerous to travel without a car making residents cross highways on foot to get to jobs and necessary resources (Lipsitz, 1995; Lipsitz, 2011). The black spatial imaginary focuses on a collective effort for ensuring well-being and a recognition of the value of, “...environmental protection, efficient transportation, affordable housing, public education, and universal medical care as common responsibilities to be shared...” (Lipsitz, 2011, pg. 69). The black spatial imaginary can be applied to communities of color in a more general sense, such as Hispanic and Native populations, to understand how race takes place by limiting opportunity and ultimately health (Lipsitz, 2007). The black spatial imaginary explains how segregation has made collectivity necessary within neighborhoods of color (Lipsitz, 2007). The understanding of how race takes places sets the stage for us to look at how these communities have created a model for viable alternatives.

The realities for people of color are based in a struggle for the basic needs that wealthier white people often take for granted. Food is one the most basic needs for a healthy life and consequently it is something that is part of the history of exclusion discussed above. Norgaard et. al (2011) explains, "...the production of hunger has been simultaneous with the degradation of culture and land (p. 28). For example, the Karuk, a Native group of California, were forced off their land when the government purchased it and their food production and way of provisioning was taken away from them (Norgaard et. al, 2011). The Karuk ended up resisting by illegally fishing on government land for salmon which holds cultural significance (Norgaard et. al, 2011).

Food deserts are a main indicator of food insecure areas and are often in neighborhoods of color which have been subjected to disinvestment (McClintock, 2011). Food deserts themselves are areas in which there is limited access to food, especially fresh produce (Alkon, 2012). The main food purchasing options in these often-inner city areas are from convenient and liquor stores, resulting in highly processed diets for people in these communities (Anderton-Folmer, 2013; Babb et al., 2013; Morales, 2011; Shaw, 2006). These highly processed diets lend the community to an array of health problems such as diabetes and hypertension (Heynen et al., 2012; Morgan, 2009). A study done in California showed that low food security was associated with obesity in low-income Hispanic men and women (Leung et. al, 2012) It is important to understand how food access is based in a deeper history of exclusion for minority and low-income people of color when it comes to capital of all kinds (housing, land, jobs, food, etc.) (McClintock, 2011; Sugrue, 2014).

Limited food access has also carried into the alternative food movement. It has been argued that food security movements often fail to address the social inequalities that are perpetuated by a system of exclusion (Babb et al., 2013). Exclusion has also been identified within the alternative food movement, which many argue supports white upper-class citizens who have easier access to organic and local foods because of income and physical means (Alkon & Agyeman, 2011). Guthman (2011) argues that issues in alternative food movements are categorized by colorblindness and universalism. Colorblindness refers to the lack of acknowledgement of the racial realities of groups that aren't white. Universalism explains the assumption that white preferences or values are held by all racial groups (Guthman, 2011). The first is described by a movement ignoring race disparities altogether. The latter, is described by the assumption that white values are shared by all (Guthman, 2011). The Local Trap describes the problems with assuming that a local food system is inherently best because there can be a disregard for racial understanding. This disregard can lend itself to perpetuating the system that movements often aim to dismantle (Born and Purcell, 2006). For example, using the "vote with your fork" argument when supporting alternative food fails to acknowledge people of color who can often not afford locally sourced food (Alkon and Agyeman, 2011). Simply taking on the "If they only Knew" approach to alternative food movements is not enough and fails to fully depict how food access is racialized by history and the rise of industrial food (Guthman, 2011). Privilege is important to point out when trying to understand food systems and it is critical to acknowledge the history of exclusion in the US.

3.3.2 Food Movements-Models of Building Resilience

The Community Food Security (CFS) movement grew out of the Community Food Security Empowerment Act of 1995 to address food system problems (Morales, 2011).

Community Food Security (CFS) is defined as access to healthy and culturally appropriate foods (Babb et al., 2013; Reynolds, 2010). Food security is closely linked with food justice initiatives that focus on empowerment through food access projects for communities. A study done across several US states on CSA programs in inner cities showed that overcoming health disparities associated with food deserts is contingent upon both access of healthy foods and knowledge for residents (Seguin et. al, 2017). The CFS movement has been criticized for not fully addressing the source of racial disparities when it comes to food access because of prominent white leadership (Mares and Peña, 2011; Morales, 2011).

Food justice engages more of the social issues of food access, emerging out of identifying racial inequalities and health issues associated with food deserts (Kato, 2013; Morales, 2011). Movements centered around food justice are built around communities of color who suffer most from food system inequalities and ensure these communities have a role in every step of their food down to decision making (Alkon & Agyeman, 2011). Food justice movements focus on dismantling racism as a crucial part of food security (Morales, 2011). Food justice is more than voting with your fork and goes further to ensure communities have a voice in controlling their food systems (Alkon & Agyeman, 2011). Food justice favors, "...a more environmentally sustainable food system to imagine that all communities, regardless of race or income, can have both increased access to healthy food and the power to influence a food system that prioritizes environmental and human needs over agribusiness profits" (Alkon &

Agyeman, 2011, p. 6). Control over a food system is directly tied to minorities participation in the production of their food and their access to healthy and culturally appropriate foods. Mares and Peña (2011) argue that food justice focused on food sovereignty values is a way to ensure autonomous food systems. Such systems present an alternative possibility to the broader dominant alternative initiatives that do not engage with racial realities adequately. Food sovereignty sees food as a basic human right (Mares and Peña, 2011). The food sovereignty movement started out of La Via Campesina and is rooted in a community right define their food systems by managing both environmental and food systems. (Alkon & Agyeman, 2011, 8). By working for food justice through a food sovereignty context, knowledge, ways of knowing and social ecological memory can be supported (Barthel & Isendahl, 2013; Tornaghi, 2017). This framework for food justice allows for a holistic approach that not only looks at slow or local attributes but also, "...respects local knowledge, wherever and whenever it is found" (Mares and Peña, 2011, p. 201). When approaching food justice with food sovereignty values, power structures are more closely looked at resulting in awareness that can ultimately reverse harmful power dynamics for people of color (Mares and Peña, 2011).

Food security and food justice are important components when creating resilient food systems. Food justice and food security are linked by, "...individuals and organizations who recognize a problem, reconstruct it as an opportunity, and organize around it while at the same time empowering communities in agricultural production, healthier consumption, local politics, and economic self-determination" (Morales, 2011, pg. 169). Heynen, Kurtz, and Trauger, (2012) discuss the connections between food sovereignty, community food security and urban agriculture. These concepts have been widely theorized and employed to combat power

structures. There are various outlets in which food justice and food security have been practiced within cities and efforts have often centered on urban agriculture (Babb et al., 2013; Reynolds, 2010). Food justice and community food security can oppose the industrial food system and even further, capitalism in which profits supersede any environmental or social concerns (Alkon & Agyeman, 2011; Reynolds, 2010).

The literature strongly suggests urban agriculture as a route to food justice. Urban agriculture can be carried out in a variety of ways. Community gardens, CSAs, Farmer's markets, and food networks between growers and organizations have all been suggested as ways of cultivating food justice (Alkon & Agyeman, 2011; Babb et al., 2013; King, 2008; Reynolds, 2010; Stone, 2016). Although most of the literature suggests community gardens as the main way to bring food justice to communities, other modes of practicing urban agriculture do show potential in achieving food justice. Farmer's markets and CSAs cultivate farmer community relationships strengthening trust between people and growers (King, 2008; Stone, 2016). Farmer's markets have been criticized for perpetuating a market solution to broader social issues, showing a lack of food sovereignty principles (Alkon and Mares, 2012). Alternatively, community gardens cultivate a sense of connection and learning throughout neighborhoods providing ownership over one's food (King, 2008). Networks between urban growers have the potential to bring organizations and individuals together to foster community empowerment (Alkon and Agyeman, 2011). These various ways local food production can be organized all serve to cultivate a city's self-sufficiency thus increasing food system resilience. Below I discuss two examples of cities where local food initiatives have increased resilience.

3.3.3 On the Ground Alternatives-Applying Resilient Models New York, NY

New York has a rich network of urban agriculture making it a good city to look at for a thriving local food system. New York has about 1,000 community gardens built on public land (Duchemin et al., 2009). Networks in New York organized around urban agriculture have been able to participate in policy implementations around what they do (Reynolds & Cohen, 2016). These networks have resulted in an increase in beekeepers, community composting projects, efforts to grow food on vacant lots, and implementation of urban agriculture and food justice in educational curriculum (Reynolds & Cohen, 2016). Community gardens in New York have put power back in the hands of communities to control what food is available to them in response to a system that has limited their options (Reynolds & Cohen, 2016). These gardens also foster economic development in vulnerable communities (Duchemin et al., 2009).

New York's urban agriculture has put power back into local communities and decreased reliance on outside resources. Urban agriculture projects in New York, led by people of color, have increased autonomy by ensuring that their efforts are not white-led (Reynolds and Cohen, 2016). This aims to combat the issues that are understood in the mainstream alternative food movement as being primarily white or at least having primarily white leadership (Reynolds and Cohen, 2016). Reynolds and Cohen (2016) are careful to explain that leadership goes beyond integrating diversity within a movement which can, "...actually risk perpetuating white, middle-class dominance as the status quo" (pg. 63). Having people of color in leadership roles in urban agriculture organizations and initiatives ensures that the people in the communities that are most effected by racism are in fact given power amid a system that is constantly undermining their self-determination (Reynolds and Cohen, 2016). Leadership in urban agriculture

movements is important not only because it allows for a shift in power but also because it allows the knowledge of the people most affected by injustices to be heard (Reynolds and Cohen, 2016).

Several projects in New York also take on a non-hierarchical model in which there is collective leadership as opposed to one person as a “director”. Three projects that use a nonhierarchical model include La Finca del Sur, Farm School NYC, and BK Farmyards (Reynolds and Cohen, 2016). Benefits of this type of organizing model include ensuring that the organization is working in a way that is collaborative and not oppressive. Each of these three organizations are not primarily African American but work with a diverse group of people from different cultural backgrounds but mostly consist of people of color. Nonhierarchical functioning organizations oppose traditional structures that have one social group controlling another (Reynolds and Cohen, 2016). This type of organizing ensures an entity is “practicing what they preach” so to speak. Some have pointed out challenges of using a nonhierarchical model is working with other organizations and government entities that do work off a hierarchical model (Reynolds and Cohen, 2016). Overall, this type of organizing proves to resist conventional power structures.

Urban agriculture organizations also work with broader social justice groups to collaborate and enact policy in New York. This type of network building creates strength across the broader food justice movement within the city and works towards creating solutions to issues (Reynolds and Cohen, 2016). Networking amongst movements centered on social justice not only strengthens food justice organizations but creates solidarity throughout the movements. Some of the food justice organizations in New York have collaborated with other

movements to work towards broader social justice goals (Reynolds and Cohen, 2016). These types of “new political spaces” ensure a number of voices are at the table, bringing social equity to neighborhoods (Reynolds and Cohen, 2016).

New York illustrates a good example of organizations that are using urban agriculture to work towards social justice. These initiatives are not only focused on issues of food access but combating harmful power structures as well (Reynolds and Cohen, 2016). The amount of collaboration between social justice organizations throughout the city demonstrates the power that network building holds in implementing policy changes and bringing more voices to the table (Reynolds and Cohen, 2016). These efforts are not met without challenges as land access and funding are hard to come by within a city with such a large population. White groups often have access to more influential networks allowing them easier funding. Additionally, volunteer time for gardens is also a challenge as most volunteers have full time jobs (Reynolds and Cohen, 2016). However, these challenges do not outweigh all the meaningful work that has been done within the city to increase social justice through urban agriculture projects.

Detroit, MI

Detroit has been one of the hardest hit cities when it comes to deindustrialization and segregation. Detroit’s economy once relied on the auto industry, but it was short lived as white flight in conjunction with the rise of racial capitalism, devastated inner city residents of color (Sugrue, 2014). Industry leaders found it more financially beneficial to move out of the city resulting in the ultimate decline of the inner-city economy and the lives of residents as many were unable to move due to racially prejudice housing policies and lack of economic means (Sugrue, 2014). This in conjunction with other policies, such as Urban Renewal, worsened

segregation by breaking up neighborhoods of color to design highways for the automobile, a luxury that many people of color could not afford (Gross, 2017; Lipsitz, 1995).

Urban agriculture in Detroit emerged out of the large disinvestment that has occurred within the city. Many of the projects in Detroit have occurred out of pure necessity (Quizar, 2014; Walker 2014). The city has been cleared of capital, especially any healthy food retailers. This in addition to the low access to both public and private transportation make getting fresh foods a daily struggle (Quizar, 2014; Walker, 2014). This unique history is what has given rise to urban agriculture within Detroit both out of need and as a type of resistance to a conventional system that is fixed in oppression. The abandonment of capital and the flight of middle to upper class people within the city has made land abundant allowing projects to sprout up organically (Quizar, 2014; Walker, 2014).

Detroit has established a significant amount of urban agriculture largely out of necessity. Historical segregation and abandonment of capital within the city has resulted in a large amount of vacant land in which most of the African American population have taken the opportunity to produce food (Quizar, 2014; Walker, 2014). This need is largely due to a lack of jobs and financial resources to drive to get food in general for many of the residents throughout the inner city (Sugrue, 2014; Quizar, 2014). The demand for growing food sprouts from a long struggle for justice within the communities throughout the city (Quizar, 2014). These efforts within Detroit are cultivating alternative systems focused on local wellbeing as opposed to economic growth (Walker, 2014). These projects have established strong community relations resulting in cross-generational ties that have allowed for places of learning (Walker, 2014). This type of community building has not only increased access to healthy foods but allowed the

community to control their food system itself in direct response to a system that has left their communities sick and disenfranchised (Quizar, 2014; Walker, 2014).

Urban agriculture projects in Detroit have occurred both legally and illegally. As Walker (2014) points out, one project had to work hard to build relationships with local officials to ensure they could start their project legally. Quizar (2014) points out that until recent years after the passing of legislation that made most growing practices legal, most projects within the city were illegal. These realities illustrate the desperate need and act of resistance stemming from citizens mobilizing to combat food security issues.

The movements within Detroit are based on their own unique definition of food sovereignty in solidarity with the wider global movement (Quizar, 2014). The food sovereignty movement in Detroit is not only based out of a need for food but, also out of the idea that having control over something so necessary for life can then carry over into broader aspects of social justice (Quizar, 2014). This reflects the support of the local economy that urban agriculture provides because it can retain the local circulation of money but also increase other social forms of capital that come from reciprocal relationships. This type of informal economy is an additional form of resistance to racial capitalism (Walker, 2014).

Detroit illustrates how a city can remain resilient despite a devastating racial history. The residents in Detroit have used urban agriculture as a form of direct resistance to a system that has not had their health or wellbeing in mind (Quizar, 2014). The resistance itself is seen not only in the cultivation of healthy foods that are widely unavailable to the African American population residing in the inner city but through the informal ways that agriculture has brought

the community together (Walker, 2014). Detroiters definition of food sovereignty is one that is unique to the realities of living in a city that has drained the power of its African American population. This definition is rooted in self-determination and autonomy over one's food. Urban agriculture in Detroit is doing more than growing food but growing power over one's own wellbeing.

3.4 Conclusion

Local food production is a viable and even necessary response to the industrial food production model. First, local food production can be informed by a social ecological approach that aims to bridge the human-nature divide. Secondly, local food is a relevant response to climate change because small scale production can reduce greenhouse gas emissions and increase food security in the face of temperature and precipitation changes. Lastly, local food production contributes to local economies by providing local circulation of capital and jobs. These positive characteristics of local food production show that this model will not only become necessary in coming years but that it will offer significant social and ecological benefits.

The US is a country that was founded on racism and still functions by disempowering many people of color (Wolfe, 2006). This analysis aimed to unveil the more recent history of people of color living in cities. The government policies and support for white affluence over equality have directly shaped the lives of people of color and especially African Americans living in many of the inner cities throughout the country. This has crucial effects on health, overall wellbeing, and self-empowerment (Alkon and Agyeman, 2011; Sugrue 2005).

There are many movements that are working towards social equality through food. Food is one of the most tangible and important ways that social inequity plays out within many

cities throughout the country making it a viable starting point for establishing equality (McClintock, 2011). Movements like the community food security movement and food justice movement are actively trying to work towards such equality (Alkon and Agyeman, 2011). It is important to look at all movements through a critical lens to ensure that inequalities are not replicated (Guthman, 2011). The movements within New York and Detroit show ways in which food movements are empowering communities and not perpetuating inequalities. This is a point that many alternative food movements have been criticized for.

Detroit and New York both have thriving urban agriculture networks which addresses not only food security issues but also wider social justice issues. Movements in each of these cities have focused on power in a way that ensures that social justice goals are met. In New York networking between urban agriculture organizations and broader social justice groups have established a way to ensure that a broad group of voices are heard (Reynolds and Cohen, 2016). Additionally, in Detroit urban agriculture has strengthened communities through cross-generational ties cultivating educational spaces for self-empowerment (Walker, 2014). Urban agriculture in both cities has applied unique strategies to resist the forces of racial capitalism such as nonhierarchical organizing models and illegal growing out of resistance (Reynolds and Cohen, 2016; Quizar, 2014). These examples can be extremely helpful in cultivating socially just food systems and communities in cities across the US.

Flagstaff is not a large city in comparison to the cities that have been analyzed in this chapter but segregation in the city still functions much like larger cities (City-Data, 2000-2016). Farming is not cheap especially in Flagstaff where land is at a premium. To increase the number of growers within Flagstaff, alternative relationships with land will be required such as land

leasing programs to ensure that people of color have the means to grow food. Decolonial practices will be needed to help support the autonomy of the Hispanic and Native community food production. Flagstaff's population is mostly white; however, the Hispanic and Native community still make up about a third of the total population of the city based on the 2015 census (Data USA, 2015). The city itself is mostly segregated where communities of color are highly concentrated on the east side of town (City-Data, 2000-2016). The maps below taken from City-Data (2000-2016) shows the distribution of white, Hispanic, and Native American citizens in the city (Figures 3-5). Community food security and food justice models will allow for a more diverse grower base within Flagstaff as well as the equitable distribution of healthy food to all residents. Currently, there are few people of color who are growing for the community at a small farm level and many barriers to food security continue to persist.

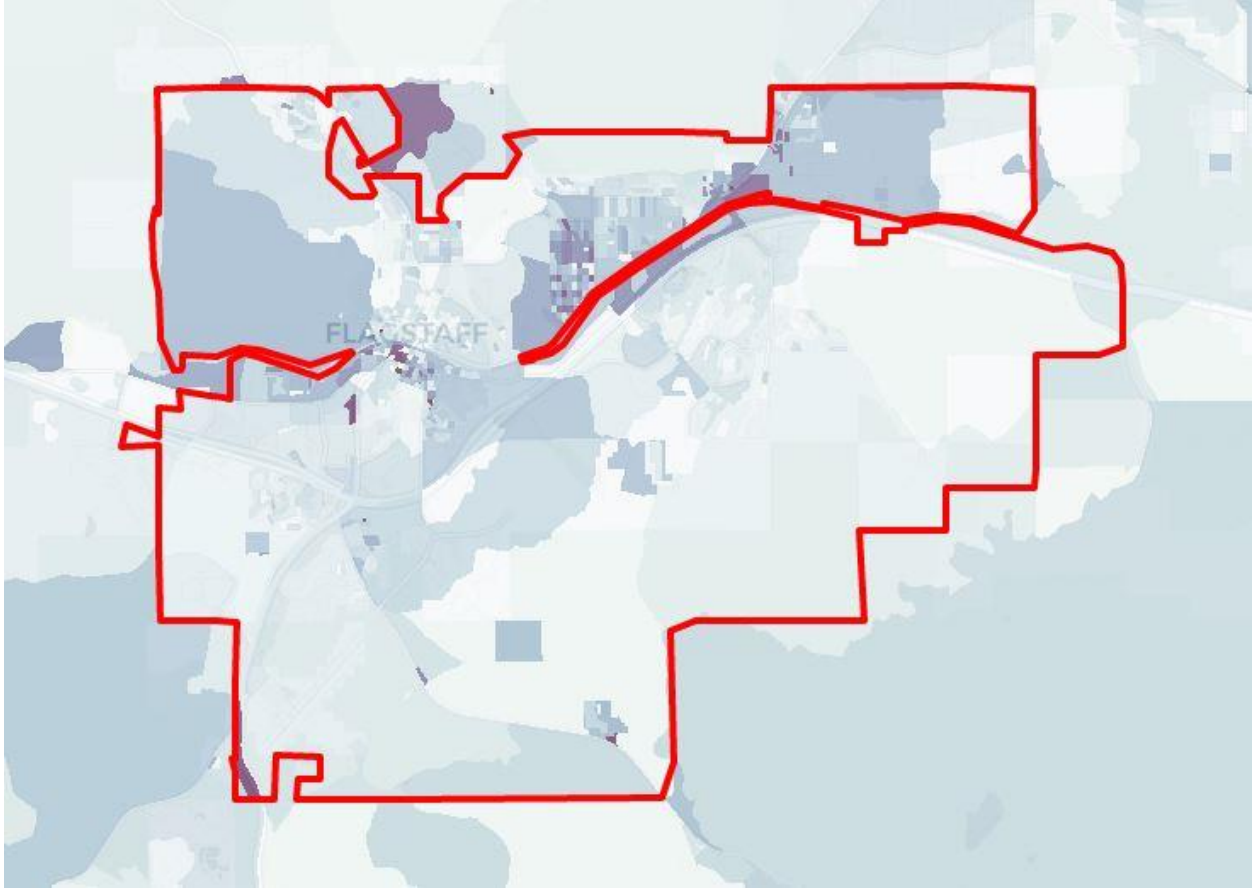


Figure 3. Geographic distribution of the Hispanic community in Flagstaff. (The darker the parcel the higher % of Hispanic residents live there)

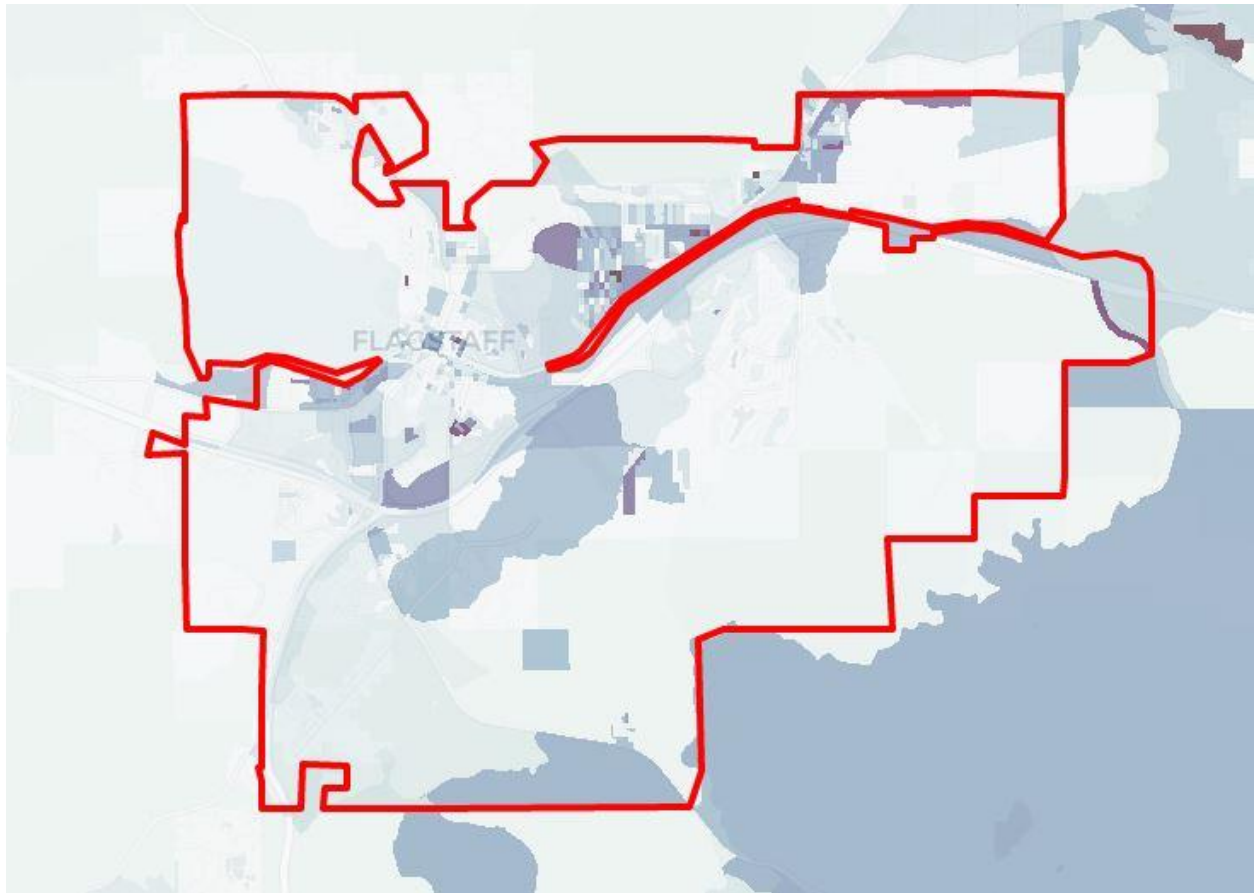


Figure 4. Geographic distribution of the Native population in Flagstaff. (The darker the parcel the higher % of Native residents live there.)

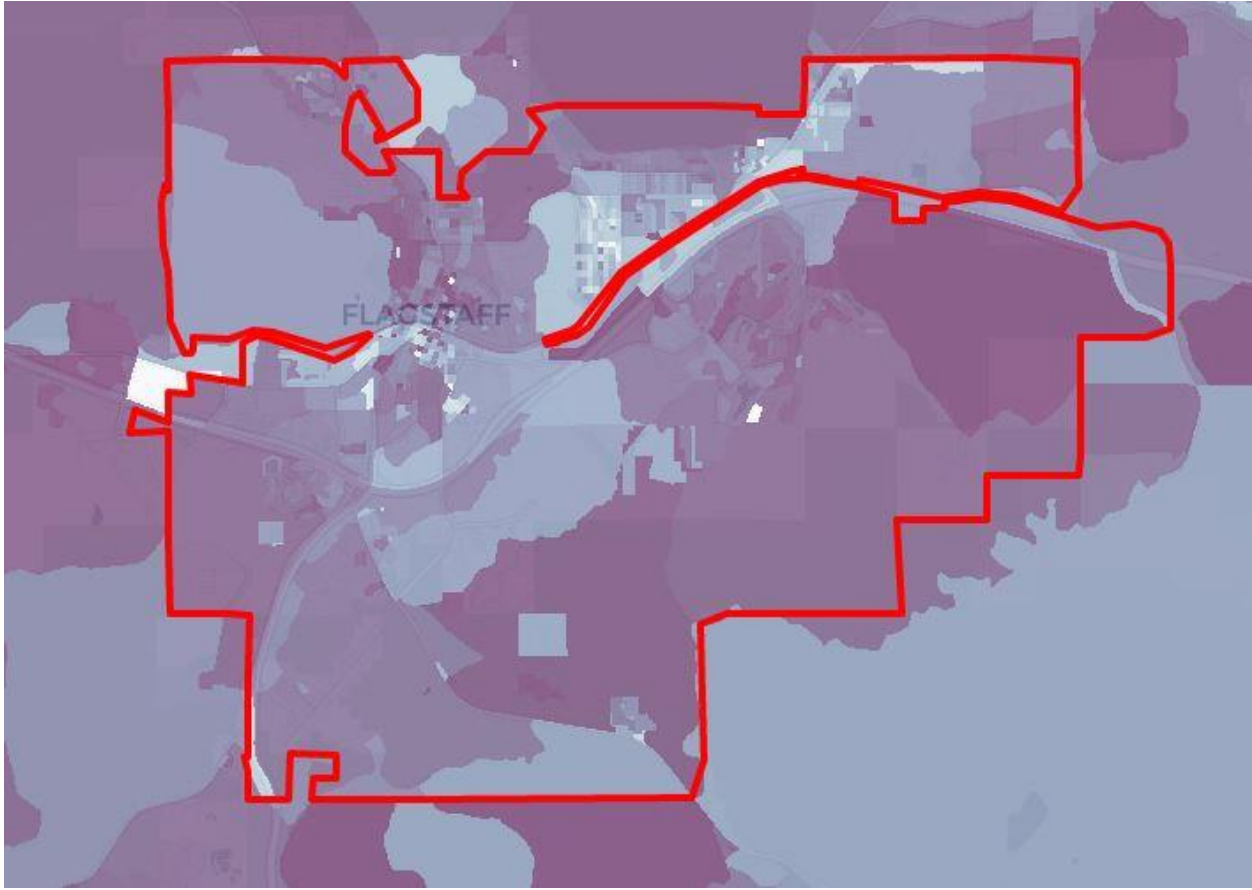


Figure 5. Geographic distribution of the white population in Flagstaff. (The darker the parcel the higher % of white residents live there.)

Chapter 4. Methods

4.1 Introduction

For this project I used two methods: semi-structured interviews and document analysis. Both of these social science methods are qualitative. This chapter will explain how I conducted the research. I used semi-structured interviews for the basis of this research while I used document analysis to supplement information gained through the interviews. I conducted eleven semi-structured interviews and analyzed six documents to create data for this research. I conducted the interviews with local growers within the Flagstaff region and with employees at regional organizations that work to support farming practices. The documents that I analyzed included two previous Sustainable Communities theses, the Local FARE report done for Northern Arizona in 2011, and four newspaper articles on local farming in the Flagstaff region. The following outlines my research questions and the methods used to answer each of them:

1. What does food system resilience look like in Flagstaff and what are recommendations for supporting and growing food production?
Method: (this is the overall goal of the research) document analysis, semi-structured interviews with growers and organizations
2. Where is current local food production in and around Flagstaff? And why?
Method: document analysis, semi-structured interviews
 - a. What are the tradeoffs, barriers, and constraints of urban vs. periphery production?
Method: semi-structure interviews
3. What are the scales of production for various growers in and around Flagstaff?

- a. How does scale relate to location based on barriers to land access?

Methods: semi-structure interviews

4. Where are local growers distributing their produce? To whom and who is missing?
 - a. How are socioeconomic factors related to both growers and consumers?

Methods: semi-structured interviews

4.2 Study Group

To get a better understanding from the perspective of local growers I interviewed six growers. Each of the growers were in various stages of developing their operation: while some have been around for several years others were just getting up and running and one did not have land yet. The variety of production stages within my study group allowed for a diverse perspective on farming in and around the Flagstaff region. The questions I asked in my interviews were framed around how growers had gotten started growing food, programs that have helped with funding, as well as distribution efforts and challenges to their overall process based on location or general high elevation farming struggles. I also asked growers how they saw a resilient food system thriving in Flagstaff. The outline of questions I asked growers can be found in Appendix A.

I also interviewed five employees at regional organizations that work with local growers. These organizations included Coconino County, City of Flagstaff, Flagstaff Community Market, Flagstaff FoodLink, and the Natural Resources Conservation Service run through the USDA. This array of government and non-governmental organizations allowed for a diverse perspective on farming support within the Flagstaff region. Three of the five organizations were government

agencies while one was an LLC, and another was a non-profit organization. I interviewed only one individual at each of these organizations. I asked these respondents questions centered on how they support farming efforts and the role of equity in their work as well as constraints to the work that they do. The outline of questions I asked individuals working for these organizations can also be found in [Appendix B](#).

4.3 Semi-Structured Interview Overview

The primary method used to gather data in my study was semi-structured interviews (SSIs). This method has been widely used throughout the social sciences to obtain data for studies on a variety of topics (McIntosh & Morse, 2015). SSIs are used to gain information from research participants on a subject which ultimately results in either the assessment, validation, elaboration, refutation of existing knowledge, or the finding of new information around a subject (McIntosh & Morse, 2015). The interviewer prepares with a set of the same questions for all participants, from there the researcher can decide if they want to include scripted probes or natural probes as follow ups to the set of questions (McIntosh & Morse, 2015; Rabionet, 2009). SSIs allow a certain flexibility because the questions are open-ended allowing the participant to elaborate as much as they want about their experiences and views (McIntosh & Morse, 2015). Interviews can be conducted in a variety of ways especially with the rise of internet communication; however, face-to-face interactions with participants have been favored in many accounts (Campbell et. al, 2013; Irvine et. al, 2013; McIntosh & Morse, 2015). There are both advantages and disadvantages to face-to-face interviews. Some of the advantages include a more natural interaction and the ability to notice nonverbal cues. However, some of the main disadvantages relate to more socially scanned responses which

might result in a filtering of feelings around a topic (Irvine et. al, 2013; McIntosh & Morse, 2015).

Rabionet (2009) breaks up the interview process into several steps. These steps include selecting the type of interview, establishing ethical guidelines, designing the interview protocol, conducting, and recording the interview, creating the interview protocol, and reporting the findings (Rabionet, 2009). Rabionet (2009) chose semi-structured interviews because she knew what topic she wanted to learn about, but also wanted to hear the stories of the participants. In a sense, semi-structured interviews allow the researcher some control over the interview topic while allowing the participant freedom in answering the questions. The researcher can then provide probes that can steer participant answers if there is a misunderstanding of a question or a need for more detail (McIntosh & Morse, 2015; Rabionet, 2009).

Coding is an important part of interpreting SSI data in ensuring it is reliable. Reliability can be defined in terms of stability, accuracy, and reproducibility (Campbell et. al, 2013). Coding can be difficult when interpreting semi-structured interviews because each participant in the study will have their own unique responses to questions. This makes ensuring mutual exclusivity of codes highly important during the coding process to allow that each code represents a distinct idea (Campbell et. al, 2013). Mutual exclusivity ensures that there is no overlap between codes. Codes can be determined upon the review of literature before the coding process begins or codes can be developed simultaneously as the coding and transcription starts. The use of qualitative data analysis software can be used as a helpful tool in coding and interpreting interviews (Campbell et. al, 2013; Irvine et. al, 2013; McIntosh & Morse, 2015; Rabionet, 2008). Specific details on how I applied these methods are described below.

4.3.1 SSI Application

Before interviews were conducted, I created a pre-determined list of interview questions for both study groups (Appendix A) (McIntosh & Morse, 2015; Rabionet, 2009). When I conducted the interviews I then added questions where I felt they were needed based on the discussion I was having with a participant (McIntosh & Morse, 2015; Rabionet, 2009). I recorded each of the interviews and then transcribed them on my own without the use of software. From there I combined the farming interview answers into one document and the organizational entity interview answers into another. I then coded for themes found within each of these combined documents based on common phrases or topics that were brought up within the interview. Due the size and scope of my project, I did not use software for the coding analysis. Instead, I organized interview responses based on the questions I asked and then found common themes within the set of responses for each question. Identifying themes within my interviews then allowed me to apply them to my research questions accordingly.

4.4 Document Analysis Overview

Document analysis is a method that involves the evaluation of various materials related to a research topic (Bowen, 2009). Documents are defined as, “anything in existence prior to the research at hand” (Merriam, 2014, 140). Analyzing documents in qualitative research can extend from census data to films and anything in between (Bowen, 2009; Merriam, 2014). For example, Merriam (2014) used public records and these records included anything from mass media reports to government documents. Document analysis is often used as a supplemental source of information in research allowing for additional context to support data from other research methods such as SSIs (Bowen, 2009). Documents can also serve to add to the knowledge base of a research project (Bowen, 2009).

Much like semi-structured interviews, researchers begin document analysis with specific questions in mind that shape the selection of documents (Merriam, 2014). The next step is to identify documents, analyze their credibility, and determine whether a source is primary or secondary (Merriam, 2014). Two components of deciding on sources include: 1) whether it can answer your research questions and 2) if it can be easily acquired (Merriam, 2014). The availability and preferences for sources can leave parts of a certain story or important information out of the analysis process (Merriam, 2014). Additionally, some documents may not be useful if they have not been created for research purposes and determining accuracy of documents can be difficult (Merriam, 2014). However, documents can often be the best source for certain information where interviews may not be relevant, especially for historical information (Bowen, 2009; Merriam, 2014).

Compared to the coding process used in semi-structured interviews, the coding process for conducting document analysis works best when the nature of the documents are analyzed and not quantified (Merriam, 2014). Thus, the researcher pulls main themes from documents to code results like SSI data analysis (Bowen, 2009). It is also important for the researcher to understand how a certain document fits into their research by determining if it gives a comprehensive perspective on the research topic or if it adds to a specific topic within the broader research (Bowen, 2009). Critical analysis of the content within documents is also necessary to understand both how the information was obtained within a document and if there are components of the topic that were left out (Bowen, 2009).

4.4.1 Discourse Analysis Application

I reviewed a total of seven documents under the document analysis method. These documents were used to add to the knowledge base of my research thus, seven documents were sufficient (Bowen, 2009). Of the seven documents, I reviewed two previous Sustainable Communities theses. One thesis focused on personal gardening in Flagstaff. The second was a review of the 100-year agricultural history of Coconino County. I also reviewed the Local FARE report that was done for Northern Arizona that looked at the need and feasibility of local food in the Flagstaff region. The remaining four documents that I reviewed were newspaper articles. Three of the articles were from the AZ Daily Sun and covered local growers in Flagstaff. The last article was from the AZ Capitol Times and gave an overview of agricultural histories in the state. I skimmed each document for important themes and information (Bowen, 2009). Once I identified important excerpts, a more in-depth analysis was done to determine how the information added to the research data. I then compared data from the document analysis to the themes found in the SSIs to examine how they addressed my research questions.

4.5 Conclusion

The two methods used in this research, SSIs, and document analysis, complemented each other well (Bowen, 2009). Responses from my interviews and various themes were backed up by the documents I analyzed. Some of the important documents that supplemented the information from my interviews were the Local FARE report and Meredith Harwell's (2011) thesis covering the agricultural history of the region. These two reports added to my research in significant ways. A limitation of qualitative data analysis is that the researcher cannot derive statistical significance out of the research (Emmons, 2012). However, because I had a small

study group, qualitative analysis has allowed me to look more comprehensively at my findings. The following chapter will highlight the main themes and results I gathered in this research.

Chapter 5. Assessing Flagstaff's Food System Resilience

5.1 Introduction

This chapter contains my findings about the state of Flagstaff's food system resilience and is divided into several sections. The first section looks at Meredith Hartwell's (2011) work on compiling the history of the rise and fall of commercial agriculture in the Flagstaff region. The second section dives into who is farming in Flagstaff and focuses on my interviews with growers and analysis of Regan Emmons' thesis on backyard gardens. The next section looks at how growers have been able to start and maintain their operation by not specifically diving deep into their physical farming practices but more at the groups that have supported them. This section is based on my interviews with growers and organizations as well as the documents that I analyzed. I then go on to look at who is getting locally produced food in Flagstaff by discussing how local growers are distributing their produce to the community. This chapter ends with recommendations and insights for building a resilient food system pulling from my interviews and document analysis.

5.2 The Historical Context of Commercial Agriculture in the Flagstaff Region

"It is the convergence of factors that finally caused farming to be abandoned, no single factor predominated. If precipitation or the short growing season were the only determinants of longevity of Coconino County agriculture, then perhaps we would still see farms dotting the landscape where there are now subdivisions. But increased land prices, industrialization of farming, ease of food transportation, subsidies that favor larger farms over small growers, and the relative price of food versus the cost to grow it for a small farmer all restricted farming opportunity in Coconino County, contrary to assumptions widely held about the demise of agriculture in this landscape."

(Hartwell, 2011, p. 133)

Meredith Hartwell's thesis chronicles the history of commercial farming in Flagstaff and sheds light on the little-known history of the region. It is important to understand the more recent agricultural history of Flagstaff to better understand Flagstaff's food system resilience. What is missing in my analysis from using this source is the indigenous history of agriculture in the region that dates back before the state was colonized. However, Hartwell's thesis gives a great look at the rise and fall of commercial agriculture in Flagstaff and the reasons for that fall. Agriculture was an important piece of the local economy in Flagstaff between the mid to late 1800s and the early 1960s (Hartwell, 2011). The local Native community played a very important role throughout the 60 years of commercial agriculture by helping in times of harvest (Hartwell, 2011). From 1918 to 1929 potatoes were the main cash crop grown in the region in addition to small grains grown mainly for livestock feed (wheat, barley, oats, and rye). Potato yields were susceptible to disease, drought, and soil depletion in the late 1920s. From 1930 to 1955 many growers transitioned towards pinto bean production mainly because bean prices grew higher than potatoes. During the Great Depression the first Farm Bill was set in place and supported growers retiring parts of their land to reduce crop surpluses, raise prices, and restore soil health (Hartwell, 2011). The abundance of bean growers in the region sparked a cooperative in which growers came together to share the cost of equipment and a storage warehouse (Hartwell, 2011). In this period there was an increase in the use of machinery in farming allowing growers to work larger fields. Larger farming plots were encouraged during WWII in which food security was a big priority for the US government. The period from 1956 to 1965 started with a drought and the implementation of the Soil Bank Program that allowed

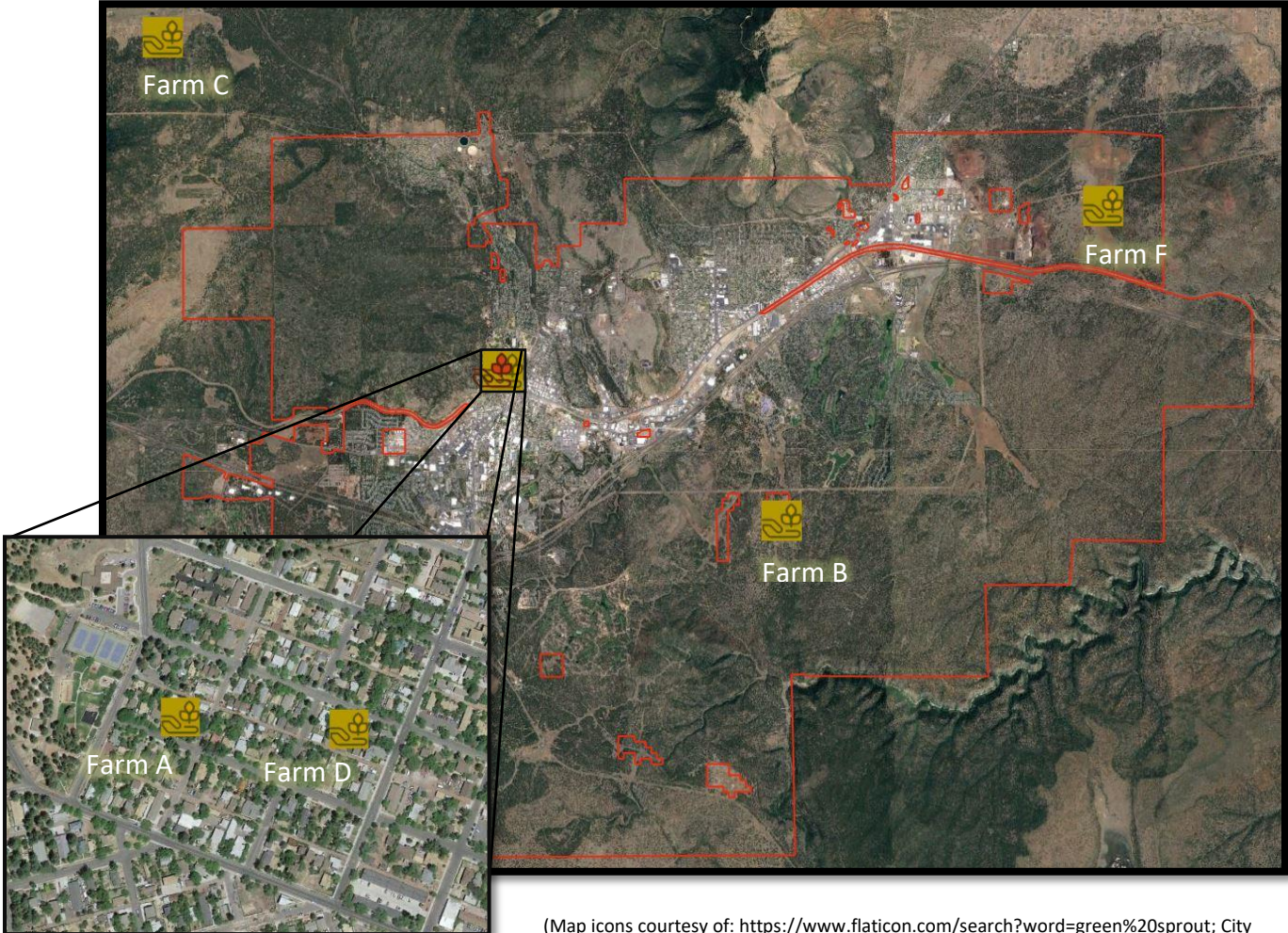
growers to retire completely for periods of 5 years in Coconino County (Hartwell, 2011). The drought coupled with larger federal policies that resulted in retiring growers (Soil Bank Program) and changes in the local economy and how locals were obtaining their food (Federal Highway Act & Glen Canyon Dam) resulted in commercial farming completely dissolving by the time rains returned in 1965. Although the end of commercial farming in the region was predicated on an extreme drought it is important to point out that there were other social factors that also played an important role in agricultures dissolution in the region.

5.3 Where is current local food production in and around Flagstaff? And why?
What are the tradeoffs, barriers, and constraints of urban vs. periphery production?

This thesis focuses on small growers in the Flagstaff region however it is important to note that there is a vibrant community of backyard growers as well as several community and school gardens within Flagstaff. The potency of the gardening community in Flagstaff was substantiated in my interviews with the city, county, FoodLink, Community Market, and several growers. My analysis is limited in this regard, however, two documents provided analyses of backyard growers both in Regan Emmons' thesis in 2012 and in the Local FARE report in 2011. Below is a basic farm profile for each of the growers I interviewed followed by a map that shows where each of the growers are growing relative to Flagstaff city limits (Figure 6).

Farm	Years of Production	Land	Primary Crops
A	1 (coming up on 2)	Leased (looking to buy soon)	Flowers and medicinal herbs
B	6	Owned	Vegetables
C	5	Owned	Vegetables
D	1.5 (coming up on 2)	Leased	Vegetables/micro greens
E	0	Looking to buy	Vegetables
F	2 (coming up on 3)	Owned	Vegetables

Table 1. Basic Farm Information



(Map icons courtesy of: <https://www.flaticon.com/search?word=green%20sprout>; City boundary courtesy of: https://map-flagstaff.opendata.arcgis.com/datasets/b6a9849eb44440999b78b1c43399f04d_0; Mapped using Google Earth) Figure 6. Locations of the farms interviewed (note: one grower does not yet have land)

The production sites of those interviewed were either within the Flagstaff city limits or within 5 miles of city limits. Farm E is the only exception because the respondent was potentially going to be growing further outside of Flagstaff in Camp Verde, which is 50 miles south of Flagstaff. However, this respondent had not yet purchased land, and the interview focused on where they might grow. Of the six growers interviewed three owned the land they were growing on, one was in a land search, and one intended to look for land to purchase this season (Farm A). Only one farm was leasing land with no intention to purchase land anytime soon (Farm D). The land owners said the land they are growing on is widely circumstantial and a result of luck. It is important to note that the two growers who were leasing land were located in downtown Flagstaff and closest to their customer base. This can be attributed to the high price and limited availability of land in the downtown region of the city. The three growers who owned their land said that affordability was one of the main determining factors in their purchases and were thus further away from their distribution streams. However, the land-owning growers did not mention any major setbacks based on their location, as they are all within a ten to twenty-minute drive to Flagstaff. The respondent from farm F mentioned that his farm property was the biggest, cheapest, and closest to town during his nearly two-year search for land stating, "This piece of property was the closest property to town, it was the biggest piece of property that we looked at and it was the least expensive. So, it really checked all the boxes." It is also important to note that one of the farms (Farm C) functioned as a nonprofit and focused on education as opposed to making a living although proximity to town was one of the criteria of their land search. The original intent for Farm C was for it to be a charter school where kids would learn all their curriculum through helping build and create

sustainable living projects. However, the farm ran into regulation issues for having a charter school in a residentially zoned area. This is where the idea for the Farm evolved into the non-profit and instead becoming a demonstration site for sustainable living where students could visit with their schools. For the growers who owned their land, affordability and personal preferences were key factors in land selection. Grower C stated, "I was originally looking at a lot of places downtown, but cost was pretty prohibitive." Those who were leasing their land (Farm A & Farm D) were able to be closer to town showing that locations within town was more of a priority to them in addition to minimizing upfront costs. Grower A mentioned leasing was a way to simply get started without huge up front costs as she is only paying for water on her current plot. She stated, "I really just wanted to get farming in Flagstaff and so this woman had like half of a lot that she wasn't using, and it was two blocks from my house, so I was like this is perfect I need to explore this because I want to get started". While Farm D wanted to mimic a zero-mile food model him and his wife witnessed when traveling in Europe. Additionally, the growers who own their land both live and grow on their property. The growers who are leasing do not live on the property where they are growing. Farm A described the benefits of being located in town, "I feel like the benefit (of my) farm plot is well first of all it's a block away from my house and it's a couple blocks away from downtown. I can walk to the market I could ride my bike I can take my product on my bike to the market. Ultimately I really want to have a very localized farm economy."

5.4 What are the scales of production for various growers in and around Flagstaff? How does scale relate to location based on barriers to land access?

The scales of production for each of the farms I interviewed were very similar and did not change much based on location. Although, many of the more established farms started very

small and have since grown. Each of the farms are cultivating less than 5 acres of land. The growers further out from town mentioned they have a greater potential to grow as they are not cultivating the entirety of their plots and those closer within town are limited to smaller parcels. The size of the farming plots was not mentioned much as being a limiting factor in my interviews. Farm D, which is located on a quarter acre lot in downtown Flagstaff, said that their small farm is extremely productive, and they might even have surplus this year. In fact, half of the growers mentioned they are producing on a quarter acre plot.

The tradeoffs that were brought up in my interviews were location specific climate factors as opposed to location-based scale tradeoffs. For example, Farm C is close to the peaks meaning it is cooler. Farm B is in a valley protecting the crops from wind while Farm F is in Picture Canyon a very windy part behind the peaks but receives more precipitation. The respondent from Farm D mentioned it being slightly warmer in town because of the higher amount of development (e.g. heat island effect). Each of the farms utilized season extenders and soil amendments to maximize the productivity of their land. Many of the farms were using bio-intensive methods that allow for multiple crop rotations in a single season. Each of the farms were using various forms of water conservation as well, whether it is through rainwater catchment, drip irrigation or both. Farm E has not yet starting production was the only grower who specifically mentioned growing drought tolerant crops.

5.4.1 The How of Flagstaff's Local Food Production

All the growers interviewed pointed out financial difficulties surrounding farming around Flagstaff, these barriers have been overcome with the help of various outlets both through direct funding and outreach. There are several strategies that growers have used to be

able to Farm in Flagstaff. One such strategy includes making a slow transition into farming as a main occupation. The second is utilizing funding from the community and organizations through grants and crowdfunding campaigns. The third and almost the most important factor of growers' success is the support of the community - whether it is at the farmer's market or through volunteering. The following discussion will highlight my findings about these strategies.

Each of the growers had been successful by slowly starting their farms while primarily focusing on other activities to augment their growing operation. In my analysis it is clear that scale is more attributed to the values of growers in addition to stages of their operations as opposed to location within Flagstaff. Many of the growers had started their farms while having other jobs that tied them into the growing community in one way or another. Grower D did a lot of work with TERRA Birds who manages and works with the community and school gardens in Flagstaff. Grower F mentioned working at the local coffee shop Late for the Train to network with his future customers and farm supporters. This job is where grower F met the county supervisor, who referred him to a county grant, as well as the coordinator for the American Conservation Experience (ACE) who has brought countless volunteer hours to the farm. Grower A had a job last season working with native grasses south of Flagstaff and will be working in Oak Creek Canyon this season at a Farm to Table retreat and will be able to maintain a plot of similar size to hers in town. Grower C worked full time as an instructor at NAU in addition to running the nonprofit farm. It was mentioned in a few of my interviews with Farms D & A that Flagstaff is an expensive city to live in. Many people have several part-time or full-time jobs to get by which is especially true in the farming community. Two of the growers had also taken a business class to ensure they have strategic plans and goals for their farms. Grower A has

already completed a business course and Farm E and her partner are currently completing a course (Spring 2018). Making the decision to become a grower is huge especially for people who are not inheriting farms, which applied to all the growers I interviewed. There are many up-front costs and new knowledge required that make a slow transition into growing almost necessary. Success requires planning and a trial and error process that can take substantial time.

<p>“I think it’s hard because it’s easy to want things immediately and now but when it comes to farming it’s such a great teacher of you got to take your time with it and the more time you take with things the better they are”-Grower D</p>
<p>“I think that the how I looked at it was just baby steps, you know? Last year was my first year growing flowers in Flagstaff and I had I think maybe had a total of maybe 100 sq. feet of ground and they were in two different places and they were all raised beds that I had to build and you know hauling the soil and the compost and just start from scratch so it was really daunting and I realized I didn’t want to do that again but it did help me (to) see ok well I can grow a lot in a very small amount of space.”</p> <p>“I took a business class and it was only a 12-week class, but it really helped me get a foundation together to write a business plan and do all my financials and get some mentorship. So, I really have a clear understanding of what are the products that I’m selling how much I’m making from them and I can really focus my time.”-Farm A</p>
<p>“Basically, I kind of started really slow, and you know I worked full time at the USGS, so I did that and then this was just kind of when I had time and it was before our little one was born too so it was kind of just slowly building this up. Also, testing it out to make sure that it could make sense before I would quit my job or anything like that. So, for the first three or so years we just sold to people we knew and then started selling at the market the second year. Once it got big enough it got to the point where I couldn’t do both.”-Farm B</p>
<p>“Basically, I got a job at a local coffee shop, Late for the Train right off the 180. I got the job there because it’s an agricultural product, coffee, coffee beans...The main scheme for it was that it would be a strategic marketing move for me. (I) basically, got to make coffee and then talk and network and communicate with all these locals.”-Farm F</p>
<p>“We started taking a business planning class which was a little different for me. So, we are just starting that...so that piece of it is really getting the business plan written and really running the numbers in terms of scale and investment. What’s doable? What do we want to get ourselves into?”-Farm E</p>

Table 2. Importance of slowly transitioning into farming from other occupations

Almost every grower I interviewed had received grants, funding, or some sort of help from local organizations and community members. The main financial support entities that were identified in my interviews were Flagstaff FoodLink, the Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP), crowdfunding campaigns and Coconino County. Non-financial support was mainly attributed to volunteer programs or individuals. Local First and Flagstaff FoodLink were mentioned by Farm B as providing community outreach that many growers do not have time for. Other non-financial support was often attributed to the grower's personal networks associated with their previous or current jobs off their farms. Growers from Farm A & E were the only two growers who have yet to apply or get funding for their farms however, they both intend to apply for federal funding. Grower A specifically mentioned that she hopes to apply for NRCS funding. Farm F was the only grower who obtained a grant from the county.

Flagstaff FoodLink's growers grant was given to four of the six growers and helped with a variety of projects last spring. The program is continuing this season (2018) and some of the growers have already applied again. Farm D was able to fund their hoop houses and all their seeds last season using the grant money provided by FoodLink's program. Farm B was able to fund five of their Farm Sharing CSA shares which provides a reduced cost CSA share to low-income families, the program is going to continue this season as well. Farm F was able to get assistance with their hoop houses last year and applied this year to help with their irrigation. Farm C obtained irrigation lines with the growers grant funding. FoodLink's respondent stated the organizations mission, "To cultivate and celebrate a local, health, equitable and resilient food system in our community" and went on to say, "There's not real point in growing here if

you can't do it in the long term". The respondent with FoodLink mentioned several ways the organization supports local growers by carrying out their mission statement. FoodLink created Eat Local Tuesdays to sponsor the Growers Grant fund and to cultivate relationships between growers and restaurants. Their biggest form of support is through the grower's grants, but they also run the backyard grower's booth at the Community Market in which several growers have started selling out of one of which was Farm B. FoodLink's respondent also mentioned the organizations focus on education and outreach which Grower B with Farm B also touched on as important in inspiring future growers. Some of Flagstaff's community outreach has included the Garden Ninja Tour which allowed community members to tour local farms and learn about high elevation growing methods, a Tour De Coop which provided a chicken coop tour for community members interested in keeping chickens, and a partnership with Willow Bend Environmental Education Center to provide food prep classes.

Another program supporting local growers mentioned interviews was the NRCS EQIP program, which provides funding for growers to implement conservation programs. The program is run under the USDA Farm Bill. Farm F and Farm B are the two farms that have gotten NRCS grants while Grower A intends to apply for funding. Grower F attributes the USDA grant with one of the main stepping off points for the farm that allowed them to get fencing, a waterline, and electricity. He stated that the farm would have been established much slower if it wasn't for that funding. Farm B was able to add to their covered cultivation space from the NRCS funding that allowed more hoop houses on their property. The respondent at the NRCS mentioned that the main way the organization helps growers is through the EQIP funding associated with the farm bill. This allows the NRCS to assist growers with environmental

conscious practices. The NRCS respondent mentioned that growers are the ones who often come to the NRCS for help and that there are few outreach campaigns although most of the growers knew about or received funding from them. The respondent at the NRCS also mentioned that there was a group of NAU students who have handed out flyers at the farmer's market in the past which led to two applicants. The EQIP program works by assessing resource concerns on a farm surrounding soil erosion, water needs, and plant production. After an assessment, recommendations are made to the farmer. The farmer then implements and makes changes and the NRCS comes to the farm to inspect the changes. The NRCS then provides the funding, assuming what was discussed upon the first inspection has indeed been met. The NRCS respondent did mention that one stipulation of EQIP funding is that the plants must be in contact with the soil so, the program does not apply to hydroponic operations however, none of the growers I discussed are using that method of growing.

Using crowdfunding, growers were able to generate additional financial support for their farms. Farm D did a campaign at the beginning of their practice to help with some of the initial costs of hoop houses and irrigation. Farm B used a crowdfunding campaign to match the amount of reduced cost CSA shares they were able to do with the FoodLink grower's grants resulting in a total of 10 reduced cost shares last season (2017). Farm F used crowdfunding to put in a fruit tree orchard last year. Farm C also did a crowdfunding campaign to help with the materials for their beds and rainwater catchment system. Crowdfunding served as an important financial supplement for half of the growers I interviewed.

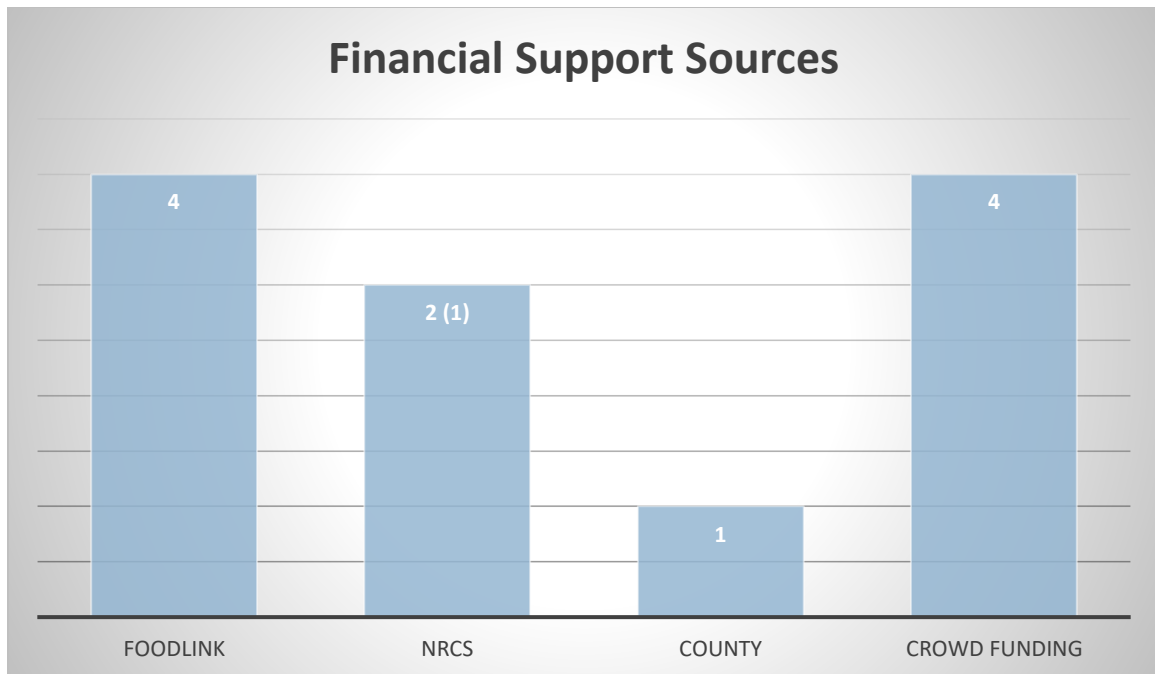


Table 3. Sources of financial support reported by growers (numbers in parentheses indicate intended application for funding but has not yet received funding)

Almost all the growers attributed their success to strong community support and volunteers. Farm D noted how their location downtown gets a lot of traffic from people walking by which leads to volunteer help. Farm C discussed the World-Wide Opportunities on Organic Farms (WWOOF) as providing a significant number of volunteers. Farm F talked very highly of ACE and that the farm would not be where it is at today without the 1,000 volunteer hours and counting that they have provided. Each of the respondents also discussed the strong support of local farms within the Flagstaff community at large and especially at the Community Market.

The county and the city have both implemented several ordinances that support food production in the Flagstaff Region. As mentioned earlier Farm F received a grant from the county in which he was able to put in 3 hoops houses. The county respondent mentioned that one of the most important things he can do is ensure that regulatory culture allows people to

grow who want to stating, "One of my primary things to do on the zoning side, we have made significant reforms that allow for first of all recognizes the constitutional rights of the state of Arizona that says if you grow something you can sell it, you can sell it off your property you don't have to be in a commercial zone." The respondent's work at the county was something that Grower B with Farm B saw as very important to the growing community. The county's work has included ensuring that the health department cannot intervene with small growing production and allowing for hoop houses. The county respondent mentioned one of his main goals at the county is to ensure that people can make a living in any way they want to, and helping small producers fit under that goal. The county respondent also stated, "the most important thing we can do is if we want to encourage local growers, have a regulatory culture that doesn't penalize them at best and straight out prohibit them at worst." The city has made changes to the livestock keeping code so people can have chickens and goats within town and intends to continually evaluate how it is helping people in the community. The city was also clearing up some and revising code to ensure that people can sell produce on their property or community gardens similar to what the county has done with zoning amendments. One of the newest programs the city was implementing is a farm incubator program that is going to review underutilized city-owned parcels to allow for 3-5-year leases for interested food producers. The respondent with the city mentioned, "I think equity is something that we always try to take into account...right now what we are really looking for is how can we supply land? Since that is the expensive piece for people and it is the hardest to find around here." When discussing barriers of growing in the city, the respondent discussed the high price of installing a water meters on properties at about \$15,000 because of the anticipation for water shortages in the city. A lot of

the community gardens in town borrow from neighbors. Farm D, located on a vacant lot, has an arrangement with the church next door to their plot to use their water.

<p>“The American Conservation Experience (ACE) has played one of the biggest roles just because they put all these boots on the ground. Something that seriously should have taken me 5 years got done by the second year I looked around and was like I am 3 years ahead of schedule.”</p> <p>“Late for the train actually was probably the biggest because Late for the Train was the reason I got the Rural Development Grant (County Grant). It’s the reason I met the people at FoodLink and the (ACE) volunteer coordinator. The social equity I built up through Late for the Train was hands down the most important thing.”-Farm F</p>
<p>“The main support of the farm is community purchasing things”</p> <p>“The FoodLink grant has been nice in helping us expand with certain projects”</p> <p>“We just got a grant for a hoop house through the NRCS, that’s going to be great to expand our covered space”</p> <p>“The first years it was just us but its gotten better with the FoodLink grant and the USDA grant but most of its just sales and making connections with the community and things like that”-Farm B</p>
<p>“The biggest supporter would be the WOOF program by far in the sense that we’ve had 40 WOOFers. When you look at the amount of volunteer hours we’ve had I want to say 12,000 hours total and WOOFers are about 41% of that...and we just got a \$3,000 grant from them.”</p> <p>“Kickstarter was really awesome...it was really helpful to have that platform.”</p> <p>“The (NAU) Environmental Science program, we’ve had 26 interns and 23 of them have been through the Environmental Science program and then we’ve worked with some of the Capstone Groups.”</p> <p>“We got a little bit of money from FoodLink last year” -Farm C</p>
<p>“FoodLink has been a support, we got a grant from them last year”</p> <p>“The church has been a huge help because they provide us with our water which we couldn’t do any of this without the water.”</p> <p>“All the other local growers have been great”</p> <p>“TERRA Birds has been a great group not only for hiring me on and providing me with some supplemental income but at the same time providing me with loads of resources.”</p> <p>“The Kickstarter was awesome because that got us connected with the SUS program at NAU and so that was really cool because it got us connected with so many groups”</p> <p>“The Growers(Community) Market they have been great resources”</p> <p>“The Land owners have given us the opportunity to grow here.”</p> <p>“The NAU greenhouse is where we were able to do all of our starts last year.” -Farm D</p>

Table 4. Shows the excerpts from the growers on the main supports of their farms both financial and non-financial.

5.5 Where are local growers distributing their produce? To whom and who is missing?
How is socioeconomic status related to both growers and consumers?

As mentioned in Chapter 3, social equity is key to a resilient system and is the basis of this thesis work. Social equity is a main component of food justice, food security, and even agroecology making it crucial to food system work (Pimbert, 2018). There are several things at play in Flagstaff's local food system related to privilege and who is growing food and who is getting local food. Several of the farms and organizations were working towards more equity. However, distributing food to lower income families is a challenge that every grower mentioned. Growers must make a living and that means they cannot always price their produce the ways they wished they could.

Privilege came up in my analysis of data both in who is growing food and who is receiving what is grown. All my interviewees were white and what I would consider middle class. This assumption was made because none of the growers pointed out difficulties getting their produce to the community market which was the main distribution platform. Thus, all the growers have the transportation means to get their produce to customers. The farms located downtown closest to the market mentioned biking or driving produce to customers when needed as well. Emmons (2012) also points out the privilege associated with backyard growers in Flagstaff. Four of the six growers interviewed were males, however, they each had female partners who also had an active role in farm operations. The other two growers were female, and one is also going into farming with her male partner. How growers distribute their produce plays a big role in the equity of a local food system.

Who is getting local produce is also an important component when evaluating food system resilience. Most of the growers utilized the Flagstaff Community Market as their main distribution platform. Grower B mentioned, “The Community Sunday Market is by far where most of our produce goes.” The Community Market respondent mentioned their mission to support local growers stating, “The market’s goal is to be the place where growers can count on strong returns for their work. So, we work a lot with growers on sharing what our perspectives are on what you should grow, when you should bring it to market, how does that fit in with the other growers. We actually spend a fair amount of time working with folks on how they build relationships with their customers and then how they market their products.” Restaurants were also a big platform for growers to distribute their produce. Farm B distributed to Criollo in the off season while Farm D distributed to the community market and restaurants equally. Farm D mentioned distributing to Pizzacleta, Root Public House, FLG Terroir, Shift, Brix, and Lotus. Grower F mentioned distributing some of their surplus to restaurants on rare occasions. Farm F has also worked with local businesses to reduce their waste streams by picking up spent grain from breweries (also mentioned by Farm D and Farm B) and char from Pizzacleta among other businesses that provide useful soil amendments. Grower F said, “When I think about what our garden is, our garden is Flagstaff because all these local products go into build(ing) the soil and then the people who eat the food get to eat Flagstaff”. Farm E also mentioned hoping to work mainly with restaurants as opposed to the markets because of the work and time that goes into the markets. CSA shares were another distribution method that all the growers mentioned as either already doing or hoping to do. Grower A intends to do mostly Weddings and direct marketing to businesses in addition to the Flagstaff Market this season (2018) but eventually

would like to have a CSA. Grower A mentioned, “I want to serve my neighborhood I want it to be a neighborhood supported agriculture share where people come to the farm pick up their (shares) and it’s all within walking or biking (distance). I feel like Arizona is just so huge and vast, but I guess the whole dream is that if we all had like a quarter acre garden that was serving our neighborhoods we would be more self-sufficient”. Farm C was approached by a local business called Tapa Burger to provide kale for their veggie burgers so that is another outlet for them. Farm D started their production by just growing micro greens but quickly realized that it is a niche market, so they have been diversifying their crops to reach the community more widely. Grower D also mentioned, “To me Flagstaff is a great place to grow, because the market is big” when referring to the supportive consumer market.

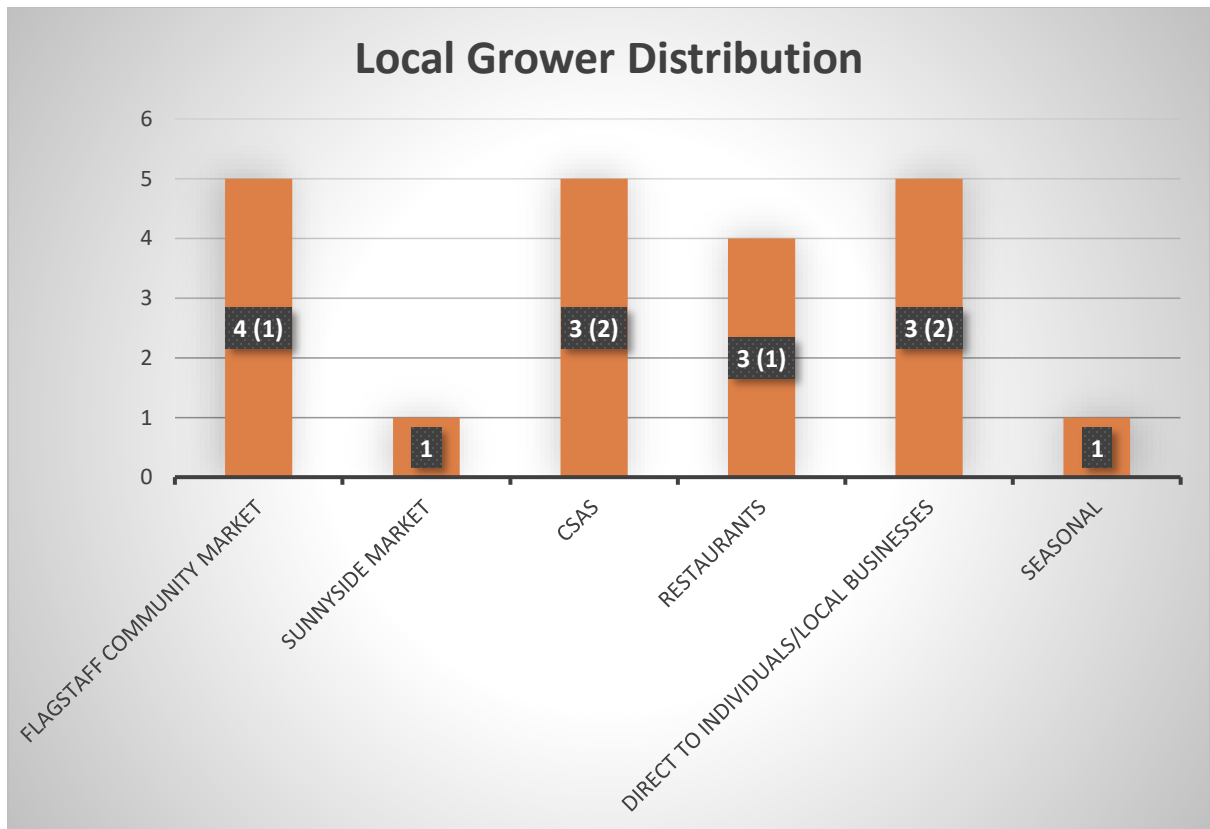


Table 5. How growers are distributing their harvests. The numbers in parenthesis account for distribution methods the growers wish to utilize but have not yet. The direct to individuals and businesses account for selling that is done directly to local businesses (not restaurants) or regular customers (not CSA). The seasonal category accounts for weddings and non-farmer's market events (e.g. Flea Markets or Holiday Fairs).

Farming is expensive, hard work, and many of the growers said that reaching the entire community with their food was a challenge. This excerpt shows the difficulty of figuring out ways to get nonfood medicinal and botanical products to lower income families for Farm A which does not focus on producing vegetables. Such information shows the limitations of a nutritional incentive program such as the Double Up Food bucks at the Flagstaff Community Market. Farm B had been able to provide reduced cost CSA shares with the help of FoodLink and community crowdfunding. Farm C did a program last season in which they donated five CSA shares to the WIC center in town instead of five families which would have been hard to

identify and was able to reach more families by doing so. Each Monday morning when most families have their WIC appointments, Grower C would drop off produce in their lobby area for anyone to take all for free. Grower C said this would be a great outlet for distributing surplus crops for other farms as well even though there is no revenue associated with it. These two farms (B & C) show a direct way of getting produce to low-income families through donated CSA shares. Farm B also mentioned selling at the Sunnyside Wednesday Farmer's market which brings a more diverse crowd than the Sunday Community Market that also runs the Double up Food Bucks program. Although it is important to mention that Flagstaff Community Market participates in the Double Up Food Bucks program, in which nutrition assistance money is matched, allowing low-income families double the produce for their assistance money. Grower A envisioned working with local shelters for women, homeless, and those battling addiction to have them work in her farm once she has her own land to build community relationships. Several growers mentioned tapping into the strong local food supporting community to get food to lower income residents through avenues such as donation programs at the cost of customers who have more financial flexibility. Providing educational classes was another hope for many of the growers. Farm E discussed wanting to have an agroecology education space once the farm is established and financially stable. Despite the extreme cost of running and maintaining a farm the local growers around Flagstaff have still found some ways to provide food to low income families.

<p>“I think with the amount of people that grow around town, there is potential for a collaboration of backyard growers that could be brought together to get more food into the areas that need it”-Grower C</p>
<p>“We try to extend out to low income populations through the subsidized CSA with the help of Foodlink. That was really great, we got a lot of good feedback from the members that were a part of it. We tied it into the Sunnyside market and it was really great, but it is hard for a farmer because we got the grant from Foodlink to cover some of the cost but it’s really hard to fundraise to keep it (subsidize CSA) going and the farm. It was really difficult, but I would like to keep it going but the problem is a steady income to help make it affordable for people and also keep the farm going because we aren’t making much money so it’s hard to sell it any cheaper than we do.”-Grower B</p>
<p>“That’s a challenge with me with farming in general because growers don’t get paid enough any ways even for selling it to the people at the farmer’s market who have the money to go drop 50 dollars at the farmer’s market on a Sunday. So, I mean (it is) certainly one of the things that’s a challenge for me is that the WIC (Double up Food Bucks program) at the farmer’s market which usually allows low income people to be able to buy food does not apply to flowers or medicinal products.”-Grower A</p>
<p>“I am struggling with how to address access without going full on, it’s like one or the other (social equity or business). The community organizing model I have learned would be so time consuming. I would not have time to be a grower, and maybe I can figure that out long term but right now I had to choose.”-Grower E</p>

Table 6. Grower struggles and ideas about getting healthy food to low-income populations.

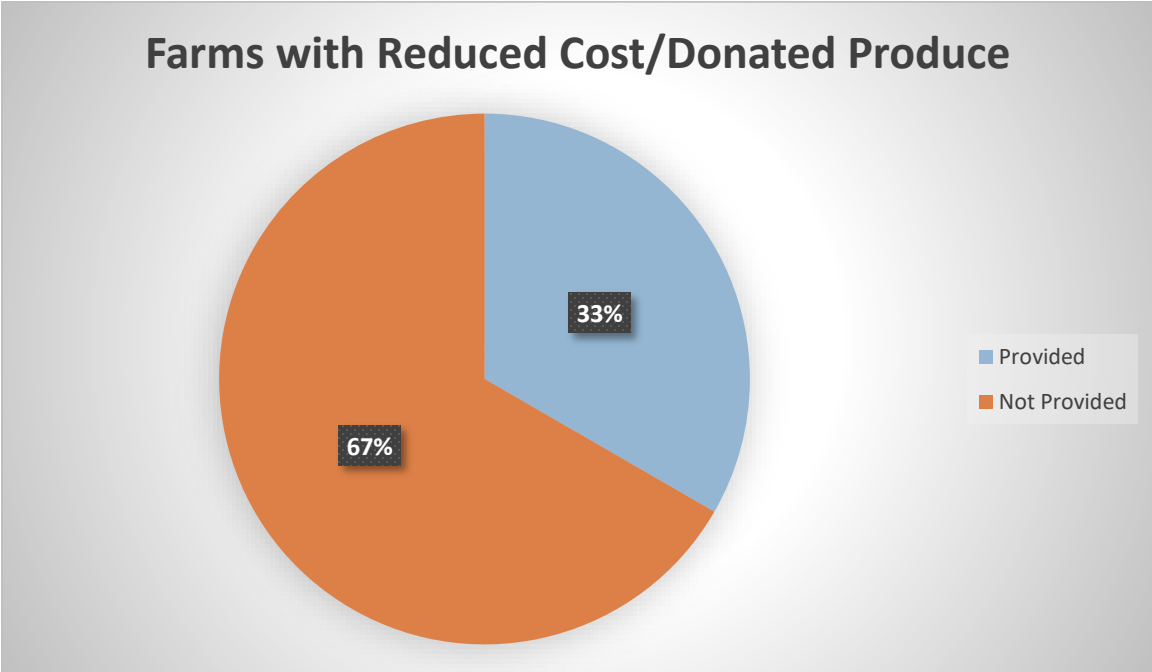


Table 7. Percentage of growers that did a reduced cost CSA or donated CSA program in 2017.

Flagstaff also has a growing personal and community gardening scene. The backyard growing community that was mentioned in my interviews with the city, FoodLink, the county, and the Community Market. Emmons (2012) work on the affordability of backyard growing in Flagstaff also touches on the abundance of growers. My interview with the city also revealed the five community gardens in town. It is important to note that there are several community and school gardens on the east side of town in which many of the minority population resides (see Figures 3-5 in Chapter 3 or Appendix A). It is beyond the scope to fully dive into the gardening community in Flagstaff although it does represent an important component of the local food system.

There is a lot happening in Flagstaff's local food system and there is a good amount of community and organizational support for growers. However, as I discussed, there are still ways the current state of Flagstaff's local food system could become more equitable and more research still needs to be done. When discussing the future resilience of Flagstaff's local food system, Grower B stated, "I think a lot of it is a supportive community which ties into the city, the county, the community members. I think Flagstaff is great for that. I see it as going in the right direction and doing well. But always more, I think a lot of it comes down to price too." It would be beneficial to have a more diverse group of growers and more diverse distribution outlets. Additionally, there is an abundance of indigenous knowledge surrounding growing in this region that has not been tapped into that could help growers in the wake of drought. Grower E stated, "We are colonizers and we have been colonized, we think we know but we do not know this land. We are still very segregated from the Native communities, they were producing a lot of food here until the late 1800s until they were suppressed in very violent

ways; it's been lost but not totally lost." Education could help with a lot of these issues in addition to research. Grower C stated, "I think continuing these conversations is going to open people up, I think getting more people involved in the food movement either through volunteering or trying to start their own (farm) will open more eyes, yeah so that might be a start at least in my eyes I think more education will be better". There are some things that are being done very well and Flagstaff is in a good position to create a more resilient and just food system. This thesis concludes with recommendations for building up resilience in Flagstaff's food system.

5.6 What does food system resilience look like in Flagstaff and what are recommendations for supporting and growing food production?

"Flagstaff appears to be at the edge of initiating a food system that is conscious of accessibility, affordability, "foodprint" education, and promoting health through food choices. Restaurants, institutions, growers' market organizers, grocers, and producers almost all share these interests, yet cite a lack of time or knowledge to close the existing gaps. Local FARE proposes that with a focus on research and an eye toward cooperative enterprise development, northern Arizona has the capacity to support a thriving regional food economy." Local FARE, 2011, Pg. 38

Recommendation #1: Creation of a Cooperative Local Food Network

Having a more organized front for local growers would allow for resources and knowledge to be more easily shared. This type of network could work across not only small local farms but both community, school, and backyard gardens as well. The Local FARE report suggests a similar effort as does Regan Emmons in her thesis which sparked the backyard grower's booth at the Community Market. Cooperative efforts and pooling of resources was also something that the bean growers did 50 years ago (Hartwell, 2011). Everyone interviewed

agreed that there are a lot of people growing in flagstaff but how they can all collectively get together is what is missing. The cooperative could be coordinated by Foodlink and other organizations to help bring growers together and share resources.

Many of my interviews with growers took place before Grower F was hosting a nacho party for some of the local growers in this study. This is one of the few networking events that were mentioned in my interviews, it was nice to see how they were all looking forward to getting together. Grower A stated, "Farm D is a couple blocks away from each other, so I buy his share (to) support him and we talk(ed) about collaborating this next season because I bought a tractor." However, each grower mentioned the challenges associated with networking and collaborating. Grower B stated, "We try and network more and more each year." Most the them mentioned more informal ways of networking mostly when they were first starting their farms and needed equipment or advice. Networking is not a regular occurrence but something that many respondents hoped for.

Recommendation #2: Continue Local Growing Education

Another theme that came up in interviews when discussing challenges is the stigma around farming in general. In today's era farming is not seen as a celebrated or viable occupation option. Grower B mentioned, "If I could get one kid to say I want to be a farmer, I would be feeling pretty good at that point". In interviews, education for the younger populations was stressed as a solution and is something that FoodLink works at as well as the school gardens in town. One respondent (Grower C) also believed strongly in youth education and points out the problems with assuming that simply buying at the farmer's market is "good

enough” but how looking at the further complexities in our food systems is where real change can happen. Another mentioned (Grower D) that when farming can be seen more as an option then there will be more growers and thus more outlets for getting that produce to the community.

Additionally, one of the mainstream thoughts for a lot of people is that it is too hard to grow food in Flagstaff (Local FARE, Emmons, Hartwell). However, there are people growing successfully here, so spreading the knowledge of high elevation growing methods is part of changing this stigma. There have been people growing here forever and as with any system it has gone through various changes, including those related to climate change. Flagstaff Foodlink was mentioned as a crucial actor for local growers. The organizations continuation of not only grant programs but outreach will be very important for the vitality of Flagstaff’s local food system. Keeping and even expanding the grower’s grant program, Tour De Coop, Garden Ninja Tours, and workshops collaborated with other local organizations will be important.

Recommendation #3: Prioritize education of Indigenous methods taught by the Native community

Indigenous knowledge and growing only came up in three of my eleven interviews. One respondent mentioned that people have been growing successfully here for thousands of years. Another mentioned how important indigenous growing methods are to sustainable growing in an arid region. This respondent also discussed how segregation and colonization play into the suppression of indigenous knowledge. The third respondent discussed how the Hispanic and indigenous communities are left out of the local food conversation in Flagstaff both in

knowledge and who is growing. He stated, “I feel like that is a big challenge, because you have this wealth of knowledge, these years of practices yet, where are they? Where is their representation in the community for that? And I think they are being overlooked”.

This could be done through workshops with local organizations and Foodlink. It would be hard to identify those in the Native community who are growing or have growing knowledge. This identification could start at the community gardens and could ‘snowball’ from there to find willing participants to run workshops or classes in town. There could even be a set of classes instead of just one here or there to ensure a comprehensive amount of knowledge is shared.

Recommendation #4: Research the best methods for yields and conservation in the region

The Local FARE report did a thorough job of displaying the demands for local food and how local producers are struggling to meet those. The report also investigated what types of season extenders are best suited for Flagstaff concluding that insulated, opaque, and ventilated extenders performed best. However, this study was done in 2011 and all the farms I talked to had started since the publication of the report. The LOCAL FARE report only talked to one small farmer within Coconino County so there is room for more research into the specifics of the successful farming practices here and what crops do best.

There are some classes around Flagstaff have been happening. But having more growing workshops in addition to research could ensure that knowledge is shared. This could be done with the help or collaboration between possibly NAU students, the Coconino cooperative

extension, and Foodlink to both continue research and then share what is learned or found.

This recommendation could also feed off and go with Recommendation #3 in which Indigenous methods are learned and utilized.

Recommendation #5: Study community garden participation and distribution efforts

It was beyond the scope of this research to look at the community and school gardens within Flagstaff and how they contribute to the local food economy. However, these gardens are an important piece of the local food system and have not yet been researched. There is a lot of research that shows the benefits of community gardens that go beyond food security as well that can be attributed to social well-being (Okvat and Zautra, 2011). Many of these gardens are in neighborhoods where minority groups reside so understanding who is participating and getting the food grown in these gardens is important information to know. One respondent mentioned in our interview, “Food should not be some elitist thing that only some people can afford”. Adding an analysis of the two markets the Community Market held on Sundays and the Sunnyside Market held on Wednesdays would provide a good comparison of populations getting local food much like Alison Alkon’s book *Black, White, and Green* (2012).

More research is needed to examine the community run community gardens (not those that are personal plot models) to see who is getting the produce that is grown there. There could even be some sort of surplus program in which community members could sell or donate produce once the garden participants have met their produce needs for the week/month. This could be in collaboration with Foodlink and the cooperative extension.

Recommendation #6: Finding those who want to grow in the community but can't afford it

It would also be good to understand who wants to grow who is not currently in Flagstaff. The city's new Farm Incubator program will be a great resource for finding these people. The program is going to provide leased land for people wanting to grow however, all the details have not yet been fleshed out. This could prove as an important program for engaging Hispanic or Indigenous growers in the local food system.

This relates to the research suggested under Recommendation #5 and could include looking at who is gardening at the community gardens and using that as a starting point to find those who wish to grow for a living and not just for themselves and their families. Foodlink, the city, and the Cooperative extension could all collaborate on this effort.

Recommendation #7: Utilizing new distribution avenues that aren't necessarily market based

Many of the growers mentioned the challenges of distributing their produce at reduced costs for low-income community members. Several farmers also mentioned the power of having such a supportive community and large customer base of people who can afford locally based food. A couple growers mentioned the opportunity for more donation-based purchasing models in which better off customers can also provide produce for low-income customers. This could be a customer saying they will pay a few extra dollars for their greens to help get local food for a low-income family. It could even be a membership model that works across all the local farms in which there is a membership fee for customers as an added cost to their CSA share to sponsor another family. These are just a few ideas, but I believe that Flagstaff Foodlink and their connections with various groups around town could be important. Another option

would be to incentivize growers to sell at the Sunnyside Market in addition to the Flagstaff Family Market. Another opportunity would be a more formalized means for growers to donate their surplus produce to low-income residents before it goes bad - much like discussed in Recommendation #5.

Chapter 6. Conclusion

“One of the most detrimental things we do to our environment is farming and I wanted to be a part of that change. Farming doesn’t have to be detrimental to the environment. Farming is something that you can cultivate and care for a healthy environment” (Grower D)

From my research it is clear Flagstaff has an enthusiastic and expanding local food scene. My intention was to assess the resilience of this system and to suggest ways in which the system could be even stronger amidst the growing inequity and uncertainties within our globalized food system. Ninety-five percent of Flagstaff’s food is not local in the sense that it is further than 400 miles away (Local FARE, 2011). The local food economy is begging to grow and the main way that can happen is by increasing local food producers. This study focused within 50 miles of Flagstaff but there could also be broader definitions of this perhaps looking at the county or even state wide. One respondent noted in her interview, “I feel like I can envision what, in 100 years, if we put in all these orchards and perennial systems scattered throughout the state and we had distribution networks running along waterways because irrigation. Long term you would have a food system going but we don’t have a lot of that”. This research also only looks at small scale producers in the region but there is also a fair amount of backyard growers as well as community and school gardens which have not been thoroughly researched. The Flagstaff community has a great interest in a local food economy however there has been little work done on the system outside of the documents I analyzed in addition to my contribution.

My research highlights the importance of constant evaluation when working towards achieving sustainable communities. Assuming the Community Market alone is good enough for Flagstaff's Local Food System is problematic when many of the growers suggested that getting produce to lower-income families was a struggle. Grower C expressed the complications associated with local food efforts, describing the local trap (Born & Purcell, 2006):

“For me growing food in Flagstaff is hard, it’s a pain in the ass, it’s exciting, it’s fun, its challenging, its everything, you know a huge rollercoaster ride. But, my cynical side is that healthy food is an elitist thing and I think a lot of people at least from my experience at the Farmer’s(Community) Market when they walk around they will look at Forestdale Farm or Flag Family Farm or Roots and they see these booths that have smaller displays, they see a booth that has a lot of lettuces or root veggies or things like that and they scoff at that and walk by and they go to a farm that’s coming out of Phoenix that is either not organic or its super massive and has wasteful water practices. They think by buying that food at a farmer’s market is they are healthy or buying local food and they don’t ask those questions of ‘What do you do here in Flagstaff? Oh, you are actually from Flagstaff you are taking these challenges’. So, I think that whole idea of well I buy food at the farmer’s market I’m good I’m contributing to society for me that’s frustrating because I know how hard this(farming) is. When you’re sitting there trying to sell a dozen eggs and some lady asks oh are those organic and I’m like no that costs a lot of money and she says oh well I don’t want that and you’re like well come and look at my chickens at my house or come over and pick your own dozen. There’s that complication of understanding about the (food) system, that’s where my whole philosophy of this place(farm) is, that we need better education to teach people local when you talk about local and when you see local growers or backyard growers whatever it is those are local and there’s a convenience to buying from Phoenix or buying from Tucson. I think that’s one of the biggest challenges, even if you have the capital you’re still going to be limited with what you are going up against.”

This excerpt displays complications of both having a broadened definition of local and what that means for producer-consumer relationships calling for a need for better understanding of food systems in general.

Research into how many families the double up food bucks program helps would be beneficial in seeing how many low-income families utilize the Community Market. Ensuring that all groups within Flagstaff who wish to grow or want to grow food for their families or the

community at large can would be a major step to help Flagstaff's food system become more resilient. Although, this is assuming that there are a fair amount of people wishing to grow here. Another piece that is largely left out of Flagstaff's food system is an understanding of Indigenous knowledge and learning about how Native groups were successfully growing food hundreds of years before Flagstaff was colonized. Removing the stigmas around farming as an occupation is another thing that could help young people see it as a rewarding and important job as opposed to something that is impossible in the region. There is a lot of hard work being done for Flagstaff's local food system on the part of the growers and organizations. This research was not meant to undermine any of this important work but to bring some critical thinking to the table to ensure that everyone continues to think of ways to engage the whole community in conversations and participation in the food they eat.

I started out this thesis by highlighting some of the problems and instabilities within the industrial food system. Industrial modes of production are at large scales and highly reliant on harmful chemicals and fossil-fuels (Berardi, 2011; Hauter, 2012). This model of production is and will increasingly become unsustainable with the rising threats of climate change. The big businesses that run commercial food influence policies making it hard for small growers to survive financially (Hauter, 2012). Commercial production in Flagstaff was not able to persist amidst drought coupled with policies that made the nationwide transit of food more convenient (Hartwell, 2011). Water is one of the most valued and threatened resources in the southwest making more sustainable approaches to agriculture necessary (Davis, 2017; Day et. al, 2014; Elliot, 2018).). Small production has been growing in Flagstaff and will be needed as the city's population continues to grow and as production in the Phoenix area faces more

challenges due to drought, heat, and reduced water allocations. As Grower F stated, “The way I see it is that Flagstaff’s population isn’t reducing, its only increasing which means as a farmer, that means that our sales range is only going to expand and get bigger and have more people to sell to”. This touches on the large demand for local foods as well as how the city’s population growth will increase those demands, this is especially true for the future of the city under climate change.

Using resilience theory as my theoretical approach was useful when looking at Flagstaff’s food system. An important factor when applying resilience to any social ecological system is to ensure that the social components are balanced with ecological ones. The importance of social factors, especially social equity, is very true when applying the theory to alternative food systems that wish to incorporate food sovereignty, food justice, food security, and agroecology values (Pimbert, 2018). Schipanski et. al (2016) describes factors that can decrease and increase a food system’s resilience in Figure 1 (Chapter 2). Factors that decrease the resilience of a food system include high levels of inequity or injustice, environmental degradation, exclusive reliance on global distribution networks, and homogenization of energy dense diets (Schipanski et. al, 2016). Factors that increase food system resilience include increase equity, biodiversity through agroecological management, increased diversity of distribution networks, and increased dietary diversity and reduced waste (Schipanski et. al, 2016).

My analysis of small growers in Flagstaff shows that there are challenges to building the resilience of the food system. Equity is trying to be addressed in getting produce to low-income groups through reduced cost methods. However, it is a challenge for growers to maintain a

living wage while trying to address social concerns. Diversity is not seen in the small growing community. Distribution networks in Flagstaff are also limited mainly to the Flagstaff Community Market, CSAs, and restaurants. There are a couple of minor distribution methods reported by growers. One grower sold eggs at the Flagstaff CSA (Grower F). Another grower sold at Sunnyside Market (Grower B). Several growers also reported they sold directly to friends and 'regulars'. All the growers mentioned using water saving methods and overall minimize their ecological footprints through growing at small scales and little to no farming equipment. Half of the growers mentioned reducing the waste streams of local businesses for soil amendments. Although environmental stewardship is being practiced by small growers, overall limitations of distribution outlets makes getting their produce to lower-income groups a challenge.

There are several ways in which Flagstaff's food system resilience could increase. Fostering a more socioeconomically diverse group of growers will be important for Flagstaff's food system resilience. Possibly increasing funding for growers to run reduced cost produce programs could allow for local food to have a broader reach within the community. Brainstorming more ways of getting local food into low-income neighborhoods for those who do not have the time or capital to grow their own food will be crucial. There are limitations to this analysis as I did not talk to anyone at the Sunnyside market or with the community gardens in town. I believe there is room for more distribution modes within Flagstaff, but this depends on having more local growers. The city's farm incubator program is a great example of the great potential for the food system in Flagstaff to increase resilience. There is a lot of support for local foods in Flagstaff and tapping more into that support to foster local food access for low-

income groups will also be crucial to the future of Flagstaff's local food system. Many of my recommendations relate to the work of Flagstaff Foodlink because the organization's mission is to support a resilient local food system in Flagstaff. Also, because Foodlink is a nonprofit and not a governmental agency, there is flexibility and opportunity in who the organization can collaborate with.

My analysis shows that there is a focus on localization within Flagstaff's local food system which makes the system susceptible to 'the local trap' in which only scale is being considered in the system and not social inequalities and power structures. It will be important for local food actors, both growers and organizations to start adopting food justice values that look at how their actions are influencing these realities. A lot of what food justice has to offer is allowing people of color to participate in their food system and have a voice, this not only boils down to growing specifically but also local politics. This is where the city and county could step in to support food justice at the local level. Additionally, food security values are being utilized in some sense in the efforts to get fresh produce to low-income residents however, it is met with many challenges. The current state of Flagstaff's local food system resilience is indeed supportive of the local scale and environmentally conscious agroecological approaches; however, food justice and food security are not being adequately included with those values.

Alternative local food movements have become an important way to building resilience in response to the racial history and current realities of our society. When minority groups are set in the center of a food system and cultivation then social equity can be achieved (Alkon and Agyeman, 2011). This model ensures that those who are most negatively influenced by our racially stratified society have an active role something that is necessary to live, food. In my

analysis, there are ways in which Flagstaff's food system could better include Hispanic and indigenous groups. However, my analysis did not account for those gardening which still needs to examine. The farm incubator program at the city has the potential to diversify those who are growing in Flagstaff. Community support for distributing local foods to low income groups will become crucial for growers to continue to be financially stable while addressing food access. Community and organizational support are the only ways that growers were able to participate in helping low income residents obtain their food.

This research provides an analysis of the current state of Flagstaff's local food system apart from community and school gardens. Growers have been successful with the help of the community and local organizations that are hoping to strengthen the local food system. The resilience of the local food system will be contingent on the continuation of this collective effort and on including Hispanic and indigenous populations. My research is in no way a comprehensive examination of the local food system, it is simply an analysis of local growers. There is little work that has been done on Flagstaff's food system, my hope was to shed light on ways to make the system could be more resilient. I hope that my research is helpful to all those working in Flagstaff's local food system to create a vision that includes the entire community in the conversation around the food we eat.

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Appendix

A. Interview Questions for Growers

1. How were you able to start a farm?
 - i. Why are you located where you are?
 - ii. What are the benefits and challenges of being located where you are?
2. How long have you been in production?
3. How do you get your produce to the community?
 - i. Who would you say your consumers are?
 - ii. How do you try and create a diverse customer base?
4. Do you network with other farms?
5. What programs have supported your farm? How?
 - i. What did these programs specifically help you with? (distribution diversity, production costs, etc.)
6. How do you think a strong local food system can be fostered in Flagstaff?

B. Interview Questions for Organizational Entities

1. What programs have supported local growers from your organization/entity?
2. Is creating a local resilient food system a main goal of your organization/entity?
 - a. Why or why not?
3. How does your organization/entity believe more urban agriculture can happen within Flagstaff? What is needed that is not currently provided?
 - a. Are there a lot of people trying to farm?

- i. How do you see your organization/entity making it easier to farm within the city? Is diversity/social justice part of this vision?
4. What policies or programs exist that constrain the ability for Flagstaff urban agriculture to expand?