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Re-storying Food System Assessments: A Community-Based Approach to Assess
Food Systems Impacts on Farmworkers

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Abstract

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Background

The current food system faces numerous challenges in meeting the demands for high agricultural production yields to feed the global population and ensure food security. Agriculture and farmworkers have been the foundation and backbone of the United States (U.S.) economy. Yet, despite the critical role they serve in our current food system, farmworkers continue to be disproportionately impacted by cumulative social and environmental factors resulting from farming practices used to increase yields and ensure the vitality of the food supply chain.

Methods

This dissertation begins by presenting a historical overview of the practices, breakthrough technologies, and increasing intensification of management practices that produced the current agricultural production and food system model. One of the primary objectives of this study was to examine and analyze the cumulative social and environmental factors introduced as management practices primarily focused on increasing crop yields that made farmworkers externalities to the farming process. Through a community-academic partnership, this project took a bottoms-up, community-driven approach to directly engage Washington farmworkers in assessing the factors that affect their lives and further understand their experiences under these new models of conventional agriculture. The data collection methodologies were grounded in community-based participatory research (CBPR) and conducted in two phases: Phase One implementation of a pilot-scale community farmworker survey (n=348); and Phase Two facilitation of farmworker digital storytelling workshops (n=18). Assessing our current food system requires situating the interconnected factors of agricultural production and food systems in contemporary and historical contexts.

Findings

The digitization of farmworker stories, paired with the data from the community farmworker survey, provided the opportunity to assess and gain new insight on how: (1) farmworkers are an indispensable part of the food system; (2) they adapt to the impacts of the current food production systems; and (3) through their lived experiences, they hold the knowledge and wisdom to bring forth justice and change to agriculture practices, food systems, and food

security. The results of the community farmworker survey described the demographic, occupational health, social, and environmental factors that influence farmworkers and their community's well-being. The findings from the digital storytelling workshops provided a deeper understanding of farmworkers' lived experiences, including social, cultural, and political sensitivities and their survival strategies.

Conclusion

This dissertation contributes to the ongoing discussion regarding the security and vulnerabilities of the current food system model. However, rather than focusing on addressing global food security through increased production and socio-technical solutions, it challenges our current assessment methods to delve deeper into the consequences of our current production systems on farmworkers and the environment. Furthermore, this research integrates the voices and experiences of farmworkers, who have historically been excluded from the conversations and decisions regarding agriculture, food systems, and food security. Their perspectives have been missing and are critical in creating a sustainable, secure, and equitable food system that does not produce unhealthy environments or pose a detrimental risk to workers who are the foundation of the food system.

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DEDICATION

I want to dedicate this work to all past, present, and future farmworkers, whose hands and labor give life through the crops they cultivate, the soil they till, the plants they plant, and the fruits they harvest. In particular, I want to dedicate this to the Familia Blancas, *esto es por y para ustedes*.

CHAPTER 1. INTRODUCTION: “THE CANARY IN THE MINE”

Despite the critical role farmworkers serve in our current food system, they continue to be disproportionately impacted by cumulative social and environmental factors resulting from farming practices used to increase yields and ensure the vitality of the food supply chain. This dissertation will present a historical perspective on the agricultural practices that have contributed to the current production and food system model in the United States (U.S.). It will characterize the cumulative social and environmental factors that impact farmworkers. This chapter provides background information to contextualize this study, presents the statement of the problem, outlines the significance of this study, presents the research questions, and outlines future chapters.

Background

The current food system faces numerous challenges in meeting the demands for agricultural production yields to feed the global population and ensure food security. Food security is primarily focused on ensuring people have the physical access and economic resources to safe and nutritious food. However, historically food insecurity has been one of the most significant drivers in global agricultural changes and the global market (Béné et al., 2019).

The response to food insecurity has been to increase the yields of food products by expanding the amount of land used to cultivate food crops, as well as by efforts to increase agricultural yields on a given area of land (Béné et al., 2019). However, the expansion and intensification of the

agricultural land area have contributed to increasing deforestation rates and the destruction of habitats for species in many parts of the world (Hazell & Wood, 2008), even wetlands.

Moreover, the pressure to produce high-quality agricultural products has increased the use of fertilizers, pesticides, and herbicides, which have resulted in soil and water contamination (Lee et al., 2008; Önder et al., 2011; Rojas et al., 2016). The consequences of these agricultural practices have been detrimental to the environment, ecosystem, and human health.

In addition, agricultural intensification and higher crop yields stimulated and supported an expansion of the global distribution of agricultural commodities. Through this process, the U.S. established itself as a global leader in supplying agriculture products that contributed significantly to its economic growth and economic prosperity. Consequently, the focus on achieving higher crop yields starting in the 1960-1970s (Gordon, 1975; Loomis & Williams, 1963) was successful in optimizing crop yields and the ability of the U.S. to have a larger role in the global trade structures and distribution channels to feed people living beyond the U.S. borders. This supported the U.S. becoming one of the dominant players in global food commodity markets.

Furthermore, the U.S.' geographic location, as well as its productive soils and climates, enabled it to expand crop yields beyond the land's capacity to support this growth, as well as to contribute to the development of the foundation for global capitalism's functioning and reproduction (Hannah et al., 1995; Xu et al., 2020). Despite the advantages of being in a temperate climate zone, the U.S., and other nations, such as Europe, have yet to implement agricultural improvements that are both sustainable and beneficial to farmworkers and the environment.

The economic prosperity, increased crop yields, and the vitality of our food supply chain can all create the appearance of a well-functioning food system and provide a false appearance that our food system is indeed secure. However, food insecurity continues to be a significant issue that is not a mere consequence of enough food produced but also encompasses hidden impacts caused by socioeconomic and political systemic and structural barriers. Some of these hidden impacts are related to potentially negative effects on the environment and as well as on farmworkers. But these types of impacts are considered as environmental externalities, and, as a result, are generally not prioritized as issues of concern for food insecurities.

Agriculture and farmworkers have been the foundation and backbone of the U.S. economy. Historically the agricultural industry in the U.S. relied on small-scale farms that were typically family owned. However, as agricultural production increased through the introduction of new technologies (i.e., machines, fertilizer, herbicides), the demand for agricultural labor increased as well (Cushing et al., 2015; Hall & Greenman, 2015; Lee et al., 2008; Morello-Frosch, 2002; Morello-Frosch et al., 2011). So interestingly, despite the advancements in agricultural technologies and mechanization of crops, the agriculture industry and present food system continue to rely on migrant farmworker labor (Administration & Department of Labor, 2015).

Our current food system of high production can operate in this efficient manner because the food production systems can access a low-paid and hard-working labor force. In fact, this U.S. labor force of farmworkers is comprised of approximately 75 percent Latinx migrants, primarily immigrating from Mexico and Central America (Administration & Department of Labor, 2015).

It's therefore apparent that farmworkers are an essential component of our food system and agriculture production; however, despite their value to high production levels, farmworkers experience health disparities and are frequently subjected to exposure of chemicals used to increase crop yields and decrease herbivory rates. These harmful impacts to farmworkers are only part of what makes environmental inequalities, but regrettably farmworkers and other environmental externalities of the farming systems are ignored by farm and food distribution channels because they are driven by economics. Thus, farmworkers experience the cumulative impact of occupational exposures, socioeconomic and political vulnerabilities, and other structural and systemic barriers (Mac & McCauley, 2017; Morello-Frosch, 2002; Morello-Frosch et al., 2011).

The impacts to the farmworkers and the environment are accepted as part of the costs incurred by farms since the economic benefits derived from food crops drive the determination of what are acceptable costs and benefits for the entire food system. Agricultural products can be purchased, replaced, or supplemented through the global food distribution system, if they may not be available as a result from issues or events on a single farm such as labor shortages or crop harvest decreases due to climatic factors. Often, the cost and benefit consequences of an individual farms are not factored into the global food distribution networks. This can result in the issues faced by farmworkers never addressed, nor are the environmental consequences that arise at the farm level when a farmer manages to improve crop yields that are unhealthy for farmworkers, their land, and the ecosystem around them.

The agriculture industry is recognized as one of the most dangerous occupations in the U.S. due to the increased exposure to chemical, physical, and biological risks (Coye, 2021). Farmworkers are exposed to pesticides, air pollutants, extreme heat, low wages, lack of access to clean water, and intensive physical labor (Brulle & Pellow, 2006; Hall & Greenman, 2015; Morello-Frosch, 2002). The adverse effects of the environmental and occupational hazards are often exacerbated by the precarity of their occupation and the concurrent exposure to psychosocial stressors experienced by migrant Latinx farmworkers (Cushing et al., 2015; deFur et al., 2007; Huang & London, 2016). These include inadequate access to food, substandard housing, family separation, discrimination, lack of social support, and limited access to healthcare (Brulle & Pellow, 2006; Hall & Greenman, 2015; Morello-Frosch, 2002; Philbin et al., 2018; Weigel et al., 2007). In addition, farmworkers are often exploited based on their spoken language, national origin, immigration status, race, socioeconomic status, and other issues. Unfortunately, farmworkers were explicitly excluded from fundamental labor rights and protections (Getz et al., 2008; Guild & Figueroa, 2018; Luna, 1999; Perea, 2011). The exclusion of these protections contributes to the workers' vulnerability and lack of protection from the occupational and health impacts common to agricultural systems. These factors present themselves as barriers and often impede farmworkers from voicing their concerns in response to unfair labor practices or other working conditions where existing laws should be protecting them.

Statement of the Problem

Although the agricultural industry is one of the most prominent economic sectors in the U.S., farmworkers are disproportionately impacted by cumulative social and environmental factors resulting from farming practices used to increase yields and ensure the vitality of the food supply

chain. The current food system model prioritizes economic gains from production and market distribution, but fails to address social, economic, and ecological impacts. Due to the consolidated global markets and economic demands, farmers and growers are often restricted in making changes and decisions to their farming practices. Farmworkers are often disenfranchised and have the limited ability to influence or modify the farm practices that directly impact their health and the health of the environment.

In addition, consumers and the public are often unaware of the food production systems that ensure the diversity of food supplies in their grocery stores. The lack of awareness regarding the U.S. food system's issues is compounded by the hidden experiences of the workers across the food supply chain. Consequently, this disconnection and lack of understanding result in a false paradigm that our food system is secure. This dominant narrative is driven and propagated by the corporate food regime and the stories generated by the distribution chains that benefit from the farm practices and the farmworkers' labor.

Difficulty overcoming and addressing these issues requires the characterization of these factors. Many of the challenges faced by farmworkers are interrelated. They will need a holistic socioecological approach to assess and characterize the impact of our current food system on farmworkers and agricultural communities. This assessment will require the inclusion and participation of farmworkers who are directly impacted. Historically the voices and experiences of farmworkers have been excluded from the conversations and decisions that directly affect their health. As a result, farmworkers have not been able to tell their story in their own voice. Without data from a holistic assessment and the participation and inclusion of farmworkers' voices and

experiences, our food system is at risk of collapsing. In addition, consumers will continue to be unaware of the impact of their food consumption decisions. This knowledge and information are critical for creating a more sustainable, secure, and equitable food system.

Purpose of the Study

The purpose of this study is to examine our current food system model by assessing and characterizing the current cumulative social and environmental factors that impact farmworkers' health and well-being. Through a community-academic partnership, this project took a bottoms-up community-driven approach to directly engage Washington farmworkers in assessing the factors that affect their lives and further understand their experiences. The data collection methodologies were grounded in community-based participatory research (CBPR) and were conducted in two phases: Phase One implementation of a pilot-scale community farmworker survey (n=348); and Phase Two facilitation of farmworker digital storytelling workshops (n=18).

Research Questions

The central premise of this research is that our food system cannot be secure until the safety, health, and wellbeing of farmworkers and our environment is secure. This study was guided by the following research questions.

- How secure is our current food system?
- What are the consequences of our current agricultural production system?
- How effective are our current food system models in assessing farmworker and environmental issues?

- How can community-engaged research methods provide a holistic understanding of issues faced by farmworkers given our current food system?

Significance of the Study

This dissertation contributes to the ongoing discussion regarding the security and vulnerabilities of the current food system model. However, rather than focusing on addressing global food security through increased production and socio-technical solutions, it challenges our current assessment methods to delve deeper into the consequences of our current production systems on farmworkers and the environment. Being able to characterize the impacts and vulnerabilities within our food system can provide the opportunity to build resilient and secure food systems.

Furthermore, this research integrates the voices and experiences of farmworkers, who have historically been an integral part of the narratives regarding agriculture, food systems, and food security. Farmworker stories and experiences have not been given the space and credibility they deserve as they are often considered externalities to the food production systems. To enhance their credibility, I propose that digitizing the farmworker stories, paired with the community farmworker survey data, would provide an opportunity to assess and gain new insight into the impacts of our current food systems. This perspective has been missing and is critical in creating a sustainable, secure, and equitable food system.

Organization of the Chapters

This dissertation is composed of five chapters. **Chapter 1** will provide an overview of the problems facing the U.S. food system and farmworkers, well as the goals of this project, research questions, and chapter outline. **Chapter 2** will present a review of our current food system by

providing a contemporary and historical analysis. **Chapter 3** will describe the methodology and research design grounded in community-based participatory research. **Chapter 4** will provide a summary of research findings. **Chapter 5** will provide an interpretation and discussion of the results as it relates to the existing body of research related to U.S. food systems.

CHAPTER 2. HOW SECURE IS OUR FOOD SYSTEM FROM FARM TO TABLE?

This chapter will provide an overview of the U.S. Food System and the agricultural industry. It will highlight the impacts of our food system practices and management sciences on our lands, water systems and farmworkers. It will provide an overview of farmworker labor and health in the U.S. and Washington state, by providing current demographic and occupational data on farmworkers. This chapter will present the conceptual framework used in this study including the intersections of environmental, food, and farmworker justice. The goal of this chapter is to provide historical background and context on the biophysical, social/political, and economics that are important to consider when assessing the food system impact across the four domains health, environment, social, and economic effects.

Four questions provide the focus for this research. The knowledge gained from answering them will help to explain the multiple trajectories that society can pursue for its food security and sovereignty. The questions are: [1] Today, do we have a secure food distribution system from farm to table, and what did society give up on its trajectory toward this goal?; [2] If our food systems are secure, why do we continue to experience environmental/land and farm worker health issues, or are secure food systems not synonymous with healthy lands and people?; [3] Why do food systems include labor as an externality without labor rights and protection?; and [4] Do we really need a new food system model, since many agricultural systems have emerged that mimic Indigenous community practices attempting to address food insecurity and worker health holistically? Answering these questions will help to explain how we have built food systems that are unhealthy for the environment and farmworkers. It will also help us to understand what

factors or issues will change the solution trajectory of the problems that we have dealt with for over seven decades, despite the acknowledgement of these problems and solutions that have been identified many times. These historical understandings of food systems and how they have evolved over time will also help us to understand whether we already have an assessment system that will work to holistically assess the impacts and inform sustainable solutions. It will help us to understand how a food system model powered by plant breeding and genetics, fossil fuel conversion technology, and political and economic factors will or will not continue to marginalize the health of the environment/land and people who work these lands (Weightman, 2007).

Society has continued to struggle with food security throughout human history. Food insecurity occurs despite U.S. agriculture being based on highly mechanized production systems and reliance on chemical fertilizer application to grow high yield crops. In addition, food safety also impacts food security, with a considerable portion of food grown on a farm that never makes it to a table, e.g., it is microbially contaminated or eaten by rodents (Vogt et al., 2010). Through the description of historical facts, this literature review aims to provide the knowledge to address and develop a holistic approach to better secure our agricultural future and food system that does not produce unhealthy environments or pose detrimental risks to workers who are the foundation of the farming systems. The goal of this literature review is to provide the context to understand the questions just posed in an effort tell a different story than what is typically written.

Today, do we have a secure food distribution system from farm to table, and what did society give up on its trajectory toward this goal?

History of Farming

Our current food system model is a highly complex, interconnected web of parts and activities that include food-supply chains, natural resource availability, agriculture, farm labor, policy, social justice, health, history, food, culture, and consumer behaviors. These parts operate within a larger socioeconomic, geopolitical, and ecological context that are interconnected to one another. Agriculture production and efficiency are important foundations for any society in the world, and any society that ignores these interconnections has a potential to collapse and lose social and environmental resilience. The current food system relies on the food supply chain, consisting of producers, processors, and distributors to ensure food reaches consumers.

Environmental History of Agriculture in the U.S.

Agriculture production in the U.S has a long and deep-rooted history. The image of the farm and farmer has been an iconic symbol in American history, representing progress development, ingenuity, and economic prosperity. The agricultural industry is one of the most prominent industries given the advancements and the opportunities for global trade markets.

Our food system faces many challenges in being able to meet the global demand for agricultural products and ensuring food security, while protecting the environment and workers health along the food production chain. This industry will continue to be vital for humans as the global population continues to increase. According to the United Nations, the global population will reach about 9 billion people by 2050 (*Food | United Nations*, n.d.). It is assumed that technology

can provide the solutions to food production systems to feed an increasing global population. Currently, food management decisions are strongly influenced by political and economic factors affecting technology development and its usage in food distribution systems. Often decisions on the farm are made at the expense of the environment, land, and workers, lacking locally based solutions. That is, this approach is driven by higher scale framework descriptions of generic solutions to farm problems and elevates decision making to the political and economic spheres. Farming systems are diverse and require different solutions at each farm. Each farm management program should be able to identify and respond to early warning indicators of unpredictable events, which may impact the farm and exacerbate any existing negative impacts on workers and the land. To understand this history of agriculture, it is important to describe the changes in agriculture and how it has resulted in the current problems where many farmlands and laborers are not healthy and resilient. This is not a system that can continue in its current form to feed our increasing global societies without permanently harming our environment and workers.

Changes in the Agriculture industry

The transition and transformation of our agricultural system from farming to our current local and global food systems primarily occurred in the 20th and 21st centuries. The 20th century brought about many technological and biotechnical advancements including the mechanization of agriculture, manufactured chemical inputs, and genetic innovations in animal and plant breeding (Dimitri & Baron, 2020; Dimitri & Effland, 2020; Dimitri & Oberholtzer, 2009). The influences for these changes are a result of structural, technical advances, and policy changes. Understanding the changes in the practice of agriculture requires a brief introduction of biotechnology advancements, fossil-fuel generated fertilizers, technological and mechanization

of U.S. farming, precision farming (Information and Digital Systems), globalization of agriculture, farm size variation, and the corporate food regime.

Biotechnology Advancements

There is a significant body of literature which discusses the positive and negative impacts of utilization of genetically engineered (GE) or genetically modified organisms (GMO) crops. These discussions often range from the increased production yields to fundamental morals; however, for the purposes of this dissertation, we will discuss the advancements of biotechnology and its influence on our current agricultural production process in the U.S.

In the 1970s, Herbert Boyer and Stanley Cohen began to develop the science of genetically engineered (GE) and genetically modified organisms (GMO) (Cohen et al., 1973; Dimitri & Effland, 2020; Khush, 2012; Macdonald et al., 2018; *USDA ERS - Recent Trends in GE Adoption*, n.d.). This led to creation of plants/seeds that would be able to build their own insecticide or resistance to herbicides through the transfer of selected genes (Dimitri & Effland, 2020). The first food crop approved by the USDA for commercial production in the U.S. was the FLAVR SAVR Tomatoes in 1992 and by 1995 the U.S. EPA approved the first insecticide-producing crop (Cohen et al., 1973; Dimitri & Baron, 2020; Khush, 2012; Macdonald et al., 2018; *USDA ERS - Large Family Farms Continue To Dominate U.S. Agricultural Production*, n.d.). The FLAVR SAVR Tomato properties allowed for better shelf life, meaning it could last longer in grocery stores. By 1996 GE/GMO crops were introduced to global agriculture, becoming one of the fastest adopted agricultural technologies in modern agricultural history

(Khush, 2012; *USDA ERS - Recent Trends in GE Adoption*, n.d.). Most corn, soybean, canola, cotton, sugar beet production in the U.S. are GE or GMO crops (Dimitri & Effland, 2020).

In 2016, six of the major firms (The Big Six = Bayer, Monsanto, Syngenta, Dow, DuPont and BASF) which produce GE/GMO seeds consolidated into one group, and as a result dominated the global market for seeds and chemical protection. As a consequence of this merger and consolidation, farmers and growers have been restricted and limited in their choices for crop seed types and chemical inputs such as fertilizer for their crops, as these decisions and choices are predetermined and selected by the seed companies (Hendrickson et al., 2017). Because of the intellectual property rights embedded into the GE/GMO seed varieties, they must be planted and paired with specific chemicals that are often produced by the same company. This has resulted in negative economic impacts to neighboring farms that utilize conventional and organic crops. The risk of crop contamination due to *crop drift*, can force farmers to sell their crop at the price of conventional crops, which is often of lesser value (Hendrickson et al., 2017).

Fertilizer Misuse

Crop growth requires natural nutrient cycling and soil fertility management; however, the intensification and current farming practices have led to nutrient imbalances due to frequent excess application of nutrients. The most common nutrient associated with agricultural production is nitrogen (N). Crops' natural cycle is to remove nutrients from the soil in a field. The conventional practice in agriculture has been to apply fertilizers and increase the inputs into the soil. Records show since the 1600's indigenous farmers' have practiced site-specific fertilization by placing fish directly at the root of plants to help with fertilization (Goulding et al.,

2008; Lynn, 1975; National Research Council (U.S.), 1997). One of the most efficient strategies for soil fertility management is to balance the fertilizer input to the soil with the crop nutritional needs. This requires farmers to frequently monitor the nutrient cycling to determine fertilizer inputs, especially because the soil nutrient status is frequently heterogenous and not the same across all the land. Hence precision agricultural practices are not common due to this expense, so farmers generally apply more fertilizer than is needed to err on the side of making sure they have ‘more than enough’ fertilizer and never ‘not enough’. This explains the contamination of our aquatic systems (e.g., river, lakes, oceans, ground water etc.) by the leaching and erosion of excess nutrients from our farm fields, the resulting algal blooms that create anoxic zones in places like the Gulf of Mexico (Hey, 2002; Lewitus et al., 2012).

Technological and Mechanization of U.S. Farming

Mechanization in agriculture in the 20th century can be primarily characterized as the replacement of animal power with machinery that is primarily self-propelled (Dimitri & Effland, 2020; National Research Council (U.S.), 1997). In particular, the introduction of the tractor allowed farming tasks to be done at a speed and scale that seemed previously impossible.

Although there have been efforts for integration of robotics into agriculture production, it has experienced limited adoption in agriculture. However, when robots have been integrated into agricultural practices, they have enabled higher and more efficient productivity on farms. Most commonly, robotics are used in dairy operations, specifically in milking of dairy cows on large dairies (*Family Farms* | *National Institute of Food and Agriculture*, n.d.).

Precision Farming (Information and Digital Systems)

The advancement of information technology and digital systems have allowed agricultural production to increase while minimizing land usage and reducing chemical inputs (Blackmer & White, 1998; Dimitri & Effland, 2020; Fernandez-Cornejo et al., 2001; National Research Council (U.S.), 1997). They were commercially made available in the 1990s (Mcbride & Daberkow, 2003; National Research Council (U.S.), 1997). Precision farming is best considered a suite of technologies available rather than a single technique or tool. Adoption of precision farming often requires a high financial investment and learning of the techniques and their application (Dimitri & Effland, 2020; Mcbride & Daberkow, 2003). Thus, it has limited who and what types of farms have sufficient resources and capacity to integrate these new technologies.

Challenges in adoption and integration of precision farming practices include farm size and structure, crop variety, rural or remoteness of geographic locations and access to internet, and the profitability of crop type (Dimitri & Effland, 2020). It is estimated that approximately 75 percent of farms that produce corn in the U.S. utilize precision agriculture practices (Carolan, 2017). In fact, farms growing corn have a more diverse consumer stream, because of the use of corn not only as a food crop but also as biofuels.

Precision farming is advertised as allowing for more accurate, efficient, and controlled farming management. It relies on digital information to target farm production by utilizing data such as soil, nutrients, moisture, pest and yield data, and pairing it with computer-assisted machinery (Fernandez-Cornejo et al., 2001; Mcbride & Daberkow, 2003). These data and kinds of technology are commonly used in planting, irrigation, pest control, and harvest decisions and

utilized primarily for field crops (i.e., corn, soybean, rice etc.) (Fernandez-Cornejo et al., 2001; McBride & Daberkow, 2003). Incorporation of this information into decision making processes provides farmers with the environmental context essential to understanding crop growth. The most common forms of precision farming technologies utilized in the U.S. are Global Positioning System (GPS), guidance systems, GPS soil monitor and mapping, and variable rate input application technologies (VRT) (Fernandez-Cornejo et al., 2001; McBride & Daberkow, 2003). Common applications of these systems include auto steering for machine operations and the usage of drones for data collection used to inform precision farming techniques (Fernandez-Cornejo et al., 2001; McBride & Daberkow, 2003).

Precision farming techniques, such as GPS-connected tractors, have allowed for automatic steering of equipment based on coordinates, which often reduce errors and result in less wasted seeds, fertilizer, fuel, and time (National Research Council (U.S.), 1997). Digital soil mapping allows farmers to tailor their chemical application to differing soil characteristics and their specific locations in the field, which in return reduces chemical waste. In practice, precision farming suggests that there is a reduction in the application of chemicals, which should reduce the impacts of chemical applications in farms on adjacent lands and waters, as well as farmworkers. Precision is a misnomer since these chemicals are not applied at the quantity and rate to optimize growth of each crop for the site characteristics of each farm. This means that excess chemicals are added since the technology is not fine-tuned to each farm field and its variations in soil chemical, physical and biological characteristics.

Globalization of Agriculture

Agriculture was able to industrialize because of the integration of crops producing higher-yields, subsidized fertilizers, pesticides, irrigation systems, and mechanization; this period is often referenced as the ‘Green Revolution’ (National Research Council (U.S.), 1997). This period of advancement and industrialization, along with the development of the railroad and high-way networks, provided the opportunity for agricultural commodities to be exported, shifting the distribution to the global market. This expansion afforded the U.S. significant economic growth, which led to the establishment of the U.S. as a global leader in agricultural commodities.

Global agriculture production intensification during 1870-1930s was driven by industrialization in Europe and their demand for cheap food and raw materials (Friedmann & McMichael, 1989). In the 1950’s-1970s, much of the agricultural food surplus was distributed to the global south as there was an increase in the demand for food aid programs (Holt-Giménez & Shattuck, 2011).

Farm Size Variation

Many of the most visible changes to agriculture is the structural transformation of the farm size and production yields. The family farming model in the U.S. was initially one of the most common types of farming. Family farms are farms on which a family owns, and are the principal operators of, the farm (*Family Farms* | *National Institute of Food and Agriculture*, n.d.; *USDA ERS - Large Family Farms Continue To Dominate U.S. Agricultural Production*, n.d.). It is estimated that the number of farms across the country significantly decreased after the Great Depression, while the average farm size (acreage) increased (Holt-Giménez & Shattuck, 2011; Macdonald et al., 2018; National Research Council (U.S.), 1997; *USDA ERS - Large Family*

Farms Continue To Dominate U.S. Agricultural Production, n.d.). Farm size is measured in acreage and sales (Macdonald et al., 2018; National Research Council (U.S.), 1997).

According to trends measured by the Census of Agriculture between 1900 and 2012, there was a temporary increase in the number of farms during the Great Depression as more people returned to farming for their personal livelihood (Hendrickson et al., 2017). Through the innovations and advancements in the agricultural industry, one of the most significant changes has been the decrease in the number of family farms and increase in larger corporate farms, which are often owned by agricultural conglomerates (Hendrickson et al., 2017; Hoppe & MacDonald, 2016).

Corporate Food Regime

Some scholars have introduced this corporate-dominated food system as a neoliberal ‘food regime’. The concept of the agricultural food system model that describes a corporate-dominated food system as a neoliberal ‘food regime’ was first introduced by Friedmann (1987) and later elaborated by Friedmann and McMichael (1989). The definition of a food regime is ‘rule-governed structure of production and consumption of food on a world scale’ (Freidmann. Harriet, 1987; Friedmann & McMichael, 1989; Holt-Giménez & Shattuck, 2011; McMichael, 2009a). And Harvey (2005) defines neoliberalism as a “political economic philosophy that redirects government efforts towards the facilitation of market mechanisms rather than attending to human wellbeing and needs” (Harvey, 2005). Neoliberalism, in relation to food, solidifies these practices through deregulation, trade liberalization, and the privatization of public services (Hendrickson et al., 2017). This resulted in a monopolized market that favored agrifood

corporations, which could participate in the intensification of agriculture with incorporation of biotechnology and mechanization (Holt-Giménez & Shattuck, 2011).

The global demand for agricultural products and shift to global markets, solidified by neoliberal policies, weakened peasant and smallholder farmers causing an unprecedented loss of small and mid-sized farms around the world as they could not compete in the global export market (Friedmann & McMichael, 1989; Holt-Giménez & Shattuck, 2011; McMichael, 2009b). These policies included the Free Trade Agreements (FTAs) and the establishment of the World Trade Organization in 1995, among others, thus deepening of the class, gender, and regional inequalities (Holt-Giménez & Shattuck, 2011).

The social-political organization and economic structure of our food system are the foundations for the functioning and reproduction of global capitalism. So, while our current food system model prioritizes economic gains from production and market distribution, it does so at the expense of failing to address social, economic, and ecological impacts. These failures then are created by farmers and food producers being faced with the challenge of producing a commodity as efficiently and cost-effectively (cheaply) as possible and selling to the highest bidders.

If our food systems are secure, why do we continue to experience environmental/land and farmworker health issues, or are healthy lands and people not a necessity for secure food systems?

Consequences

The industrialization and capitalization of agriculture production has created an environment in which farmers and farm and food chain workers have little to no opportunities to choose what

inputs to use, which crops to produce, or what markets to sell. The consequences of this could be detrimental to the environment, ecosystem, and even to human health. The business, farm and crop management decisions are frequently made using framework descriptions generated at larger scales that do not describe the local farm and its constraints and opportunities for growing crops. The consequences of the pursuit of higher-level decisions, made at the economic and political levels, result in less priority given to local level issues. This increases the risk of poorly planned decisions at the farm level resulting in situations that could, for example, contaminate the environment from misuse of fertilizers and pesticides impacting the health of both the environment and the workers. It is important to recognize the role and potential impacts of technology when allowing this higher-level perspective to dominate farm systems. It also suggests the need to reexamine our farm practices, and even modify them if needed, so that they are still useful in the future, especially in changing conditions. For example, it will be necessary for plans to be resilient to extreme weather events that are more and more commonly experienced today. Even the covid pandemic has shed a light on some vulnerabilities of our farm practices and the process of decision-making on the farms, and in the distribution chain of the products to get them to people's tables.

Environmental Effects on the Food System & Agriculture Production

Academic scholars have long been interested in the organizational social and economic structure of food production. In 1978, Goldschmidt's study on the organization of agriculture in California during the 1940's found that industrialized agriculture had adverse effects on agricultural communities, while smaller-scale family farms were associated with more stable diverse economies and social structures (Lobao & Stofferahn, 2008; Rosset, 1999).

The current food system, which includes the food supply chain and the global market, is not functioning effectively for farmers, or the farm and food chain workers, nor even the environment. The concentrated markets place pressure on farmers, in particular ‘intermediate to mid-sized farmers’, to make difficult decisions pertaining to their farms. Unfortunately, the concentrated markets, dominated by transnational agrifood firms and production networks, limit the choices of farmers to decide only what crops to plant, what inputs to use, and what markets to sell into (de Schutter, 2010; Hendrickson et al., 2017; McMichael, 2009a). This power imbalance hindered by financial constraints often results in devastating tradeoff decisions, which primarily impact farmworkers and the environment. For example, the focus on crop yields ignores the potential for negative soil health concerns because of these methods, as well as the local knowledge held by farmworkers who are aware of potential changes occurring on the land. A large-scale farmer may not be able to use technology to monitor for changes that are normally noticed in a more timely and helpful manner by farmworkers who are much more in touch with the environment and capable of recognizing early warning signs. There is also a perception that technology can solve the externalities resulting from our current farming practices when, even if used, it may not be used correctly.

The demand of the global markets, after European industrialization, imposed monoculture practices as farmers felt the pressures from the global markets to meet the growing demands for food, especially for niche food products. Our globalization of food for niche markets has been well documented (e.g., (Mann, 2011a, 2011b). However, the limitations and restrictions of specialized crops have constrained the farmers’ autonomy to diversify their crops due to the

limited and restricted markets. For example, soil scientists and advocates have encouraged farmers to utilize cover crops, to reduce the need for soil tillage; however, there are limited markets and values for these cover crops (Hendrickson et al., 2017). And now farm production in the U.S. has shifted to even larger farm sizes while increasing the intensification of farming (Macdonald et al., 2018). And when farms have more farmland available, they tend to specialize in monoculture practices of planting crops that have been designed to achieve higher yields; however, many of those crops have been shown to intensify the depletion of nutrient reserves in soils (Macdonald et al., 2018).

Effects of Agriculture on the Environment

The advancements in modern farming have allowed farmers to produce higher yields per acre, compared to traditional farming production. Traditional farming often resulted in serious consequences to the land, including an increase of deforestation and destruction of natural habitats (Hazell & Wood, 2008). This in part was due to the need for cropland expansion, and soil erosion caused by the need for land to be plowed more frequently to produce higher yields. However, because of the intensification of agriculture, we continue to observe an excess of agriculture-related contamination in the soil, water, and atmosphere.

Soil

Soils are interconnected with many other environmental ecosystems and therefore critical for a stable ecosystem. Ecosystem services provided by soils include mitigation of climate impact and filtration of harmful chemicals and pathogens found in the soil and environment (Wall & Six, 2015). Soils provide services that are essential to human health and well-being, including

cultural services such as recreational and spiritual benefits (Hazell & Wood, 2008; Lal, 2010; Millennium Ecosystem Assessment, 2005). Healthy soils provide resilience to crops during extreme climatic events. Soils are an integral factor in food safety, human and animal health, and the environment (e.g., water and air quality) (Romig et al., 1995). Disturbances to the ecosystem and the soil food web can increase the risk of human disease caused by pathogens that live in the soil. Examples of human disturbances are poor land management, intensive agriculture (e.g., soil tillage), and other environmental factors (e.g., climate change). Agricultural practices can impact soil biodiversity, which includes life on top of the soil as well as in the soil, and therefore these practices can result in an increased risk of human diseases (Ren Thiele-Bruhn et al., 2012).

As previously mentioned, healthy soils provide important ecosystem services and this even includes the site of, and it's impacting the functions of, many of our essential components of the nitrogen cycle. However, human disturbances can introduce chemicals, such as nitrate fertilizers, into the soil and create ecosystem imbalances that could be harmful to human health. Due intensive agricultural practices, there has been an increase in fertilizer use to boost our crop production, which frequently results in higher concentrations of nitrates in soil and groundwater, increasing chances for babies fed nitrate polluted groundwater to develop methemoglobinemia (blue baby syndrome) (Ren Thiele-Bruhn et al., 2012; Wall & Six, 2015).

Water

The increased use of chemicals by agriculture, such as pesticides, herbicides, and fertilizers, have contributed to the contamination of water sources. Water quality is certainly a concern for many rural agricultural communities with limited water sources and who often rely on private wells for

drinking water. It has been shown that pesticide runoff is one of the greatest contributors to surface-water contamination (Önder et al., 2011). As mentioned earlier, agriculture has also increased the use of nitrogen fertilizers, which has resulted in contaminants leaching or eroding from our soils into the groundwater, our drinking water, streams and eventually into the sea (Önder et al., 2011). Lack of access to clean water can result in health disparities experienced by agricultural communities, such as heat-related illness including heat-related kidney injury and kidney stones (Roelofs & Wegman, 2014; Schaider et al., 2019; Wimalawansa & Wimalawansa, 2016).

Air

Rural areas are often associated with poor air quality due to ambient air pollutants such as fine particulate matter and ozone (Jackson et al., 2010; Ngo et al., 2010). So, soils can be a source of air pollutant, especially as particulate matter is defined as liquid or solid material found in air (and airborne solid material can be soil, dust, or smoke) (*United States Environmental Protection Agency | US EPA, n.d.*). In fact, agricultural communities are often exposed to airborne particulate matter, and it can come from multiple sources, specifically from farming practices such as soil tilling, agricultural burning, crop harvest, and animal feeding operation (i.e., dairy or poultry) (Bauer et al., 2016; Ngo et al., 2010; *United States Environmental Protection Agency | US EPA, n.d.*). Unfortunately, cumulative exposure to these air pollutants, such as by farmworkers, can lead to adverse health conditions such as cardiac and respiratory disease in rural agricultural communities (Castillo et al., 2021; *United States Environmental Protection Agency | US EPA, n.d.*).

As a result of climate change and warmer temperatures which coincide with droughts, Washington State has seen an increase in wildfire smoke that has decreased air quality and impacted human health (*An Unfair Share Exploring the Disproportionate Risks from Climate Change Facing Washington State Communities*, 2018). To make it worse, the frequency and intensity of exposure to these air pollutants (i.e., smoke, dust, poor air quality) are expected to increase in the coming years (Austin et al., 2020; Castillo et al., 2021). As a result, they have become an emerging threat to farmworker health. In addition, farmworkers may have disproportionately higher exposures to these air pollutants, in particular wildfire smoke, due to their occupation which requires them to work outdoors for long periods of time (shifts), the lack of access to personal protective equipment (PPE), and lack of access to safety training and education (Castillo et al., 2021). Further, the current disparity in access to data pertaining to the burden of wildfire smoke exposure on farmworkers, presents challenges in decision-making and mitigation efforts to improve farmworker health (Austin et al., 2020).

Climate Change and Food Systems

The expansion and intensification of agriculture have contributed to deforestation and destruction of habitats for species in many parts of the world. Moreover, the pressure to produce high quality agricultural products have increased the use of fertilizers, pesticides, and herbicides (Lee et al., 2008). So, with that occurring, and then if coupled with poor land management practices and agriculture intensification, there could be long lasting negative impacts on the environment. These negative impacts on the environment could even be augmented by the impacts of climate change, or, even worse, these poor land management practices could possibly contribute to exacerbating climate change. It is estimated that approximately 80 percent of land

in this U.S. is devoted to agricultural uses (Koc & Dahlberg, 1999; Macdonald et al., 2018), so this is a significant land area being impacted. Other impacts on the environment by agricultural practices as shown by The EDGAR-FOOD study, published in 2015, reported 71 percent of food system emissions came from agriculture and were associated with land use and land-use activities (Crippa et al., 2021; *Summary for Policymakers — Special Report on Climate Change and Land*, n.d.).

The restriction imposed on farmers, food- and farmworkers increases our food system's vulnerability to externalities such as climate change. For example, it is estimated that climate change will affect the production of agriculture (i.e., agricultural yields and earnings) as well as the food supply chain and consumers (i.e., increases in food prices, and lower food quality and food access) (Castillo et al., 2021; Lobell & Field, 2007; Rosenzweig & Parry, 1994; Vermeulen et al., 2012).

However, the most significant and direct impact of climate change is projected to be on agriculture and food systems (Rosenzweig & Parry, 1994; Vermeulen et al., 2012). The increased intensity and frequency of extreme events (i.e., heat waves) result in the adverse effects of agricultural-related issues such as heat exposures, droughts, and floods (Castillo et al., 2021; Gowda et al., 2018). Thus, farmworkers are more likely to experience adverse health effects because of climate change. Examples of some of those adverse health effects are the increase in heat-related illness due to their occupation, which requires them to work outdoors for long periods of time (shifts), the intensity in physical labor, the psychosocial stressors experienced by migrant farmworkers, the lack of access to safety training and education, and the

lack of labor protection (Austin et al., 2020; Castillo et al., 2021; Morello-Frosch et al., 2011; Roelofs & Wegman, 2014; Spector et al., 2015). Outdoor workers, including farmworkers, have been deemed ‘climate canaries,’ because of their increased climate-related exposures (i.e., frequency, duration, intensity), which are a direct consequence of their employment and working conditions (Castillo et al., 2021; Roelofs & Wegman, 2014). Farmworker’s ability to take individual action to respond and adapt to climate-related effects is constrained because their working conditions (i.e., access to drinking water, rest, and shade) are controlled by their employer (Roelofs & Wegman, 2014). So, climate-related issues will have long-lasting negative impacts on farmworker health, the economy, and the environment if mitigation and adaptation strategies are not implemented.

Why do food systems include labor as an externality without labor rights and protection?

The Lack of Farmworker Protection/Agricultural Exceptionalism

The expansion and success of agriculture dominance by the U.S. is in part due to agribusiness and the corporate food regime, which relies on the exploitation of farmworkers, many of whom are immigrants. The concept referred to as ‘agricultural exceptionalism’ is the process by which farmworkers have been excluded from basic labor rights and protections (Getz et al., 2008; Guild & Figueroa, 2018; Luna, 1999; Perea, 2011). This deep history of exclusion is rooted in the systemic and racist policies that have existed since the conception of the U.S.

In her book *'Farming While Black: Soul Fire Farm's Practical Guide to Liberation on the Land,'* Leah Penniman quotes:

Racism is built into the DNA of the U.S. Food System. Beginning with the genocidal land theft from Indigenous people, continuing with the kidnapping of our ancestors from the shores of West Africa for forced agricultural labor, morphing into convict leasing, expanding to the migrant guestworker program, and maturing into its current state where farm management is among the whitest professions, farm labor is predominantly Brown and exploited, and people of color disproportionately live in food apartheid neighborhood and suffer from diet-related illness, this system is built on stolen land and stolen labor, and needs a redesign (Penniman & Washington, 2018).

In this quote, Penniman conveys the deep history of our current agricultural model, which is rooted in racism and systemic oppression. This quote provides the context for the sociopolitical construction that upholds the current exclusion of worker rights in our current agricultural labor market.

Farmworkers and migrant workers support much of the crop production throughout the U.S. and contribute significantly to the economic vitality of their communities and state; however, they are afforded minimum worker protection benefits. The U.S. and state governments have maintained the vulnerability of farmworkers through policies and exclusions of agricultural farmworkers from accessing health and labor benefits.

Some of the most significant labor rights legislation in the U.S. were included in the Fair Labor Standards Act of 1938 (FLSA), the National Labor Relations Act, and the Social Security Act. However, farmworkers were explicitly excluded from these protections and benefits which included federal overtime, child labor requirements, state minimum wages, workers compensation, and occupational safety and health protections (Getz et al., 2008; Guild &

Figueroa, 2018; Perea, 2011). The exclusion of these protections contributes to workers' vulnerability and lack of protection from health impacts common to farm systems.

History of Farmworkers in the U.S.

Although the image of the family farm continues to be an iconic symbol in present day America, the reality is that agriculture in the U.S. has relied on a poorly paid but large labor force, primarily consisting of immigrants. Historically, the agricultural industry in the U.S. relied on small-scale farms that were often family owned; however, as agricultural production increased through the introduction of new technologies (i.e., machines, fertilizer, herbicides), the demand for agricultural labor increased as well (Cushing et al., 2015; Hall & Greenman, 2015; Lee et al., 2008; Morello-Frosch et al., 2011). The U.S. has a historical pattern and dependency on importing labor, including enslaved people and indentured servants from Africa, Asian immigrants, Mexican Braceros, and the current H2A worker program, to meet the labor demands (*Bracero History Archive | Home*, n.d.; *Farm Workers | NFWM*, n.d.; Penniman & Washington, 2018).

The Bracero Program was introduced during a period when the U.S. had a labor shortage because of World War II (*Bracero History Archive | Home*, n.d.). A treaty signed between Mexico and the U.S. in 1942 provided temporary guest worker visas to more than four million Mexican workers (*Bracero History Archive | Home*, n.d.). Although this program was terminated, it continues to have an influence on the immigration policies as it institutionalized the labor market between Mexico and the U.S.

Farmworker Labor

According to the National Agricultural Worker Survey (NAWS FY 2015-2016), about 75 percent of agricultural workers in the U.S. are immigrants from Mexico and Central America and about 6 percent self-identified as being indigenous between the ages of 25-34 years of age (*Agricultural Workers Tables*, 2018). This is even represented in Washington state where there is a high percentage of agricultural workers that are indigenous from Mexico and Central America. These unique characteristics contribute to language and cultural issues that can prevent workers from seeking resources or reporting concerns that result from their work. This allows their mistreatment and unfair labor practices to continue, since they do not have a voice in this power imbalanced situation.

According to the NAWS survey, about 33 percent of agricultural families live below the federal poverty line. We can infer that this is a result of the seasonality of this work and employment wages (the average individual income can range from \$17,500 to \$19,999, and the average family income can range from \$20,000 to \$24,499) (*The National Agricultural Workers Survey, Employment Training Administration (ETA) - U.S. Department of Labor*, 2018).

Table 1: National Agricultural Worker Survey (NAWS) Demographic Information. (*The National Agricultural Workers Survey, Employment Training Administration (ETA) - U.S. Department of Labor, 2018*)

Variable	n (% of total w/ i category)
Sex	
Male	4,206 (68)
Female	1,136 (32)
Age (years)	
14-19	205 (7)
20-24	498 (11)
25-34	1,358 (26)
35-44	1,276 (23)
45-54	1,104 (19)
55-64	693 (11)
65 and over	204 (4)
Ethnicity Hispanic	4,447 (83)
Migrant Seasonal Agricultural Worker	786 (19)
Education (number of school years)	
No Primary	207(4)
Primary (1-6 yrs.)	2,152 (37)
Middle (7-9 yrs.)	1,034 (19)
High School (10-12 yrs.)	1,421 (30)
Post-Secondary (13-16 yrs.)	520 (10)
Annual Personal Income \$30,000 or more	990 (14)

Washington state has a high agricultural worker population, and in the past 10 years employment in agriculture has increased by about 30 percent (*An Unfair Share Exploring the*

Disproportionate Risks from Climate Change Facing Washington State Communities, 2018; *Washington State Employment Security Department*, 2018). Agricultural jobs in Washington state continue to be an important source for employment opportunities (*Washington State Employment Security Department*, 2018). Agricultural workers often work on farms maintaining crops (i.e., fruit and vegetables) and/or tending to livestock (*Bureau of Labor Statistics*, 2018). Unfortunately, agricultural workers and their families are often exposed to hazardous conditions including pesticide exposure, extreme heat, low-wages, substandard housing, lack of access to clean water, inadequate food access, and no healthcare (Brulle & Pellow, 2006; Hall & Greenman, 2015; Morello-Frosch, 2002).

Factors that affect farmworker vulnerability are not independent from one another. For example, for some new immigrants, linguistic isolation, lack of citizenship, and limited educational attainment can all contribute to limited job mobility, which results in an increased vulnerability to farm practices, which in turn increases exposure to toxic chemicals (Brulle & Pellow, 2006; Hall & Greenman, 2015; Morello-Frosch, 2002). For this reason, it can be challenging to isolate and measure the importance of individual factors that affect health as these factors have a cumulative impact on their health. Farmworkers are often exploited because of their spoken language, national origin, immigration status, race, socioeconomic status, and other issues. These factors act as barriers and impede workers from voicing their concerns in response to unfair labor practices or other working conditions where existing laws should be protecting them.

Migration

Due to the seasonal nature of agricultural crops, agricultural workers may migrate between cities and across states in search of employment opportunities, often establishing temporary homes near their current work location. These migration patterns are known as the ‘migrant streams’ and are divided into three streams: eastern, midwestern, and western. These migration streams often start in the southern parts of the U.S and follow the crops north throughout the seasons.

One of the most significant policies that impacted Latinx immigrants was the North American Free Trade Agreement (NAFTA). The agreement between the US, Mexico, and Canada (1993), enabled agricultural products (i.e., corn, and meat), subsidized by the U.S. Farm Bill, to be produced at a low cost in the U.S. (Mcbride & Daberkow, 2003; McMichael, 2009a). This policy, which prohibited Mexican crop subsidization, displaced many farmers in Mexico by flooding the Mexican market with the cheaper products from the U.S. and thus threatened the Mexican community food security due to the decrease in corn prices in Mexico to stay competitive (McMichael, 2009a).

As stated by La Via Campesina, ‘the massive movement of food around the world is forcing the increased movement of people’ to search for other locations to survive and feed their families (*Via Campesina: Globalize the Struggle, Globalize Hope!*, n.d.). This includes not only the social movements, but forced migration, as the global corporate food system model deepens the gender, class, and poverty inequalities. Immigration and migration “push” and “pull” factors that drive workers and their families to the U.S. include poverty, natural disasters, and violence in their home country. Many farmworkers are also climate refugees, leaving their home countries because of climate change and lack of access to resources. With immigration policy changes,

cross-border migrations have decreased, resulting in an increase in the number of permanent seasonal workers, with no rights, who can be deported at any time (*Farm Workers* | *NFWM*, n.d.).

Health in Agricultural Communities

Health disparities are often attributed to individual health behaviors such as nutrition and exercise; however, research studies have found that the *conditions* in which an individual is born, lives, plays, works, worships, and ages can contribute to their quality of life (Brulle & Pellow, 2006). These conditions are known as the social determinants of health (SDOH) (See Table 2), which include health and healthcare, neighborhood and built environment, social and community context, education, and economic stability (Baron et al., 2014). By examining "place-based" determinants of health, we can then identify additional factors that can also affect health outcomes.

Table 2: Social Determinant of Health (SDOH) variables experienced by agricultural communities. (*National Agricultural Workers Survey | U.S. Department of Labor, n.d.*)

SDOH	Health & Health Care	Social & Community Context	Education	Economic Stability
Current	● Minimal Health Coverage ● Low Access to Healthcare ● Cultural and Linguistic competency to communicate with health professionals ● Chronic health conditions ● Unable to Cover Health Expenses	● Isolation ● Assimilation ● Support Systems ● Discrimination ● Stress ● Political Climate	● Literacy Language (Spanish Tyrique, Mixtec, and Coracholan) ● Access to Education	● Employment ● Income ● Occupational Injuries & Illness
Future	<u>Negative:</u> Increase discrimination and political climate will continue to prevent access to basic needs and resources. <u>Positive:</u> Increase in population demographics social cohesion and community resiliency may strengthen			

Health outcomes can be determined by an individual or population's vulnerability to conditions such as environmental conditions and their ability to respond or recover. Therefore, it is important to identify environmental risks and understand the protective factors that exist within a community, which can then be used to help mitigate those negative outcomes. Protective factors can include community resources (i.e., health care, education, and employment opportunities) and social cohesion (deFur et al., 2007). However, agricultural communities are located in rural or remote areas with limited community resources that could determine their abilities to respond or recover from chronic and acute exposures (deFur et al., 2007).

Health disparities and environmental inequalities in agricultural communities are in part due to the cumulative impact of occupational exposures, socioeconomic and political vulnerabilities, and other structural and systemic barriers (Mac & McCauley, 2017; Morello-Frosch et al., 2011). Many environmental researchers and advocates have used cumulative risk assessments to evaluate and understand the cumulative impact of environmental risks while considering the social and political implications they may have on an individual or community health (Evans & Marcynyszyn, 2004; Huang & London, 2016). Despite these cumulative risk assessments, we have been unsuccessful in identifying thresholds at which a risk would need to be mitigated or prevented.

The Framework for Cumulative Risk Assessment, developed by the U.S. EPA, identifies the four properties of vulnerability in cumulative risk assessment as susceptibility, exposure, preparedness, and responsiveness (deFur et al., 2007; Pepper et al., 2009; *United States Environmental Protection Agency | US EPA*, n.d.). Vulnerable communities experience higher rates of cumulative health impact and health disparities due to higher rates of exposure to environmental hazards, individual biological susceptibility, and social vulnerability (Cushing et al., 2015; deFur et al., 2007; Huang & London, 2016; Morello-Frosch et al., 2011). Studies related to immigrant health have suggested that the environment (i.e., built and social) in which they live can increase their risk for chronic conditions which makes them even more vulnerable to the exposure to a toxin (Vineis et al., 2009). In addition, rural communities experience higher rates of preventable health issues including chronic conditions (i.e., diabetes, obesity, etc.) and health-related high-risk behaviors (i.e., smoking, physical inactivity) (Castleden et al., 2008;

Downey, 2013). However, most of the cumulative risk models have been developed in populations with fewer pre-existing health conditions.

Linking Farming Practices and Farmworkers Rights = Healthy Humans and Food Sovereignty

Food Justice Movements

Food justice movements have existed for centuries and have generally emerged from communities who were directly impacted by the persistent social and environmental inequities that exist as a consequence of the food systems model. These movements seek to address inequalities in the access to food, exploitative labor practices within the food system, environmental degradation as a result of agriculture practices and environmental racism (Alkon et al., 2011; Alkon & Mares, 2012; Bradley & Herrera, 2016). These movements have consequential voices that should be considered when addressing these issues, but often do not have the platform to reach wider audiences including consumers. In fact, consumers are often unaware of the food production process and the ways in which these practices are harmful for farmworkers and their health.

Holt-Gimenez and Shattuck (2011), described the orientation and characterization of global food movement trends as being progressive and radical. Progressive food movements tend to advance practical alternatives to industrial agri-foods such as agroecological, sustainable and organic food networks that operate within the existing economic and political framework and are characterized as capitalist food systems (Holt-Giménez & Shattuck, 2011). Whereas radical food movements, seek to transform the food system, through structural reforms to markets and

entitlements, seeking redistribution of land, water, and resources (Holt-Giménez & Shattuck, 2011; Holt-Giménez & Wang, 2011).

Food Security

The topic of food security first emerged in the 1940s when the United Nations Food and Agriculture Organization (FAO) was created to help address global food security. The FAO established the Universal Declaration of Human Rights, which stated that food was an essential human right, and which was later refined by the World Bank to include ‘access to and ability to purchase food’ (*Home | Food and Agriculture Organization of the United Nations*, n.d.). Food security often focuses on ensuring people have the physical access and economic resources to safe and nutritious food. According to the FAO, food security exists when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (*Home | Food and Agriculture Organization of the United Nations*, n.d.).

Food insecurity is one of the most significant drivers in global agricultural changes. With the increase in global population and urbanization, the world demand for food security and sustainable agriculture is urgent. Historically, the response to food insecurity related issues has been expansion of cultivated land and efforts to increase agricultural yields. However, one of the fundamental causes of food insecurity is poverty and lack of access to food. In the U.S., agricultural policies, such as the Farm Bill, provide farmers with crop insurance and it has even expanded to include programs to support food insecurity, such as the Supplemental Nutrition Assistance Program (SNAP) (Key & Roberts, 2006; Macdonald et al., 2018). Without these,

poverty, food insecurity, lack of access to healthy food, and lack of proper food preparation and storage facilities may limit the opportunities for farmworkers to eat a healthy diet (Kiehne & Mendoza, 2015). But just increasing food products will not solve the *distribution* problem. This is a problem that has been around since the Green Revolution.

Food security programs often align with distributive justice efforts to ensure individuals have access to food. The concern for ensuring access to food is often focused on the distribution of food and does not distinguish from, or account for, where the food comes from or the conditions by which it was produced. These efforts may create unintended consequences that contribute to global food insecurity, including the intensification of agriculture production and the impact on soil degradation.

Despite public health and humanitarian efforts, malnutrition and micronutrient deficiencies continue to impact millions of people across the world, which can result in long-term adverse health effects. Malnutrition refers to the excess or imbalance of a person's intake of nutrients and energy. Micronutrient deficiencies can be linked to the sufficient or excessive supply of nutrients found in the soil (Tulchinsky, 2010). The most common nutrient deficiencies include iron, iodine, zinc, folic acid, and vitamin A (*Home | Food and Agriculture Organization of the United Nations*, n.d.). These nutrient deficiencies increase human susceptibility to diseases since many human diseases are caused by nutrient deficiencies (See Figure 1). You are only as healthy as the soil in which your food grows, and many agricultural systems have nutrient-depleted soils because of the overuse or misuse of soils to grow crops.

Nutrition and Disease

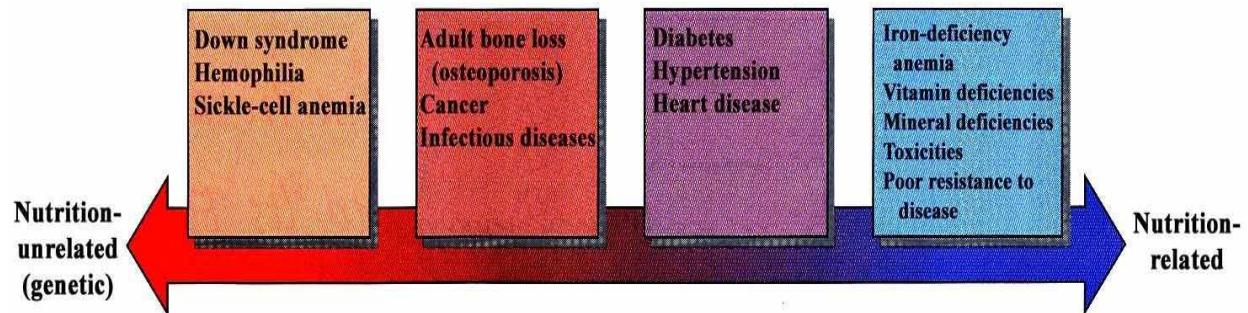


Figure 1. Diseases linked to nutrient deficiencies and the environment (and soils) and to diseases that are more genetically related. (Source: Dr. Joe Appiah-Kusi).

Efforts to address these nutritional deficiencies include food fortification, supplements, and GMO crops. Food fortification in the U.S. is regulated by the FDA. The most common staple food fortifications include iodized salt, cereal, and Vitamin D-containing milk (Rojas et al., 2016). This is a process to respond to poor quality food that does not provide sufficient nutrients needed by humans eating the food (See Table 3). However, the issues of micronutrient deficiencies can be prevented by changing our agricultural practices to ensure our soils are healthy (Labeling, 2003; Rojas et al., 2016).

Table 3: Some essential minerals and their functions for human health and the role of those minerals in plants. (Vogt et al., 2010)

Minerals	Human health link	Role in plants
Nitrogen	Important component of proteins, amino acids, hormones	Essential component of protoplasm & enzymes (proteins), important component of chlorophyll (photosynthesis); Typically, most limiting nutrient for plant & microbes
Phosphorus	Essential for energy transfer in biochemical pathways (e.g., ADP, ATP)	Essential for energy transfer in biochemical pathways (e.g., ADP, ATP); Critical for root growth
Potassium	Helps prevent heart, kidney diseases and diabetes; Deficiencies causing heart disease	Helps maintain cell turgor, selective ion uptake across root membranes, regulate water absorption through leaf pores & stomatal control; Enzyme activation (photosynthesis)
Calcium	Essential for building bones; Deficiencies causing bone deformities	Essential for building cell walls of plants; regulation of hydration; enzyme activator
Magnesium	Deficiencies causing asthma, chronic bronchitis, heart disease & bone deformities	Regulation of hydration; basal metabolism (photosynthesis)
Manganese	Part of bone formation, important in immune system	Essential for photosynthesis, controls leaf & root diseases; Nitrogen metabolism
Zinc	Needed for healthy skin, maintains immune system, aids sight/taste & smell; Deficiencies causing chronic bronchitis	Important in pollination, seed germination, enzyme activator; protein breakdown, formation of growth regulators
Copper	Deficiencies causing chronic bronchitis, heart disease & bone deformities	Photosynthesis, nitrogen metabolism
Sodium	Deficiencies causing poor nervous system development	Not required by plants
Iodine	Deficiencies causing goiters or enlargement of the thyroid gland	Not required by plants
Selenium	Deficiencies causing chronic bronchitis & heart disease; Small amounts essential for animals and human health	Not required by plants

Food sovereignty

The concept of food sovereignty emerged from an international peasants' movement associated with La Via Campesina, which brought together peasant farmers from all over the world (Desmarais, 2008). The term was introduced in 1996, when La Via Campesina published its manifesto demanding that all people have the right 'to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems' (Desmarais, 2008; *Via Campesina: Globalize the Struggle, Globalize Hope!*, n.d.). La Via Campesina emphasizes the rights of women, indigenous people, and people of color. Food sovereignty recognizes food, agriculture, society, and cultures as being intrinsically linked.

Emerging as a response from the people most negatively impacted by the consolidation of power, markets, and production of the global agribusiness food system, food sovereignty promotes food justice and moves beyond a focus of food security, by empowering people to have the autonomy to produce and provide for their own food needs (Alkon & Mares, 2012; Desmarais, 2008). This includes the rights of consumers to have the power to decide what food they eat, how it is produced, and who grows the food. Food sovereignty is a transformative process incorporating power, freedom, and democracy to build democratic and just food and economic systems (Pimbert, 2009). One of the objectives of food sovereignty seeks to dismantle the monopoly of power of the corporate food regime through the prioritization of regionally based food systems over agribusiness farming (Alkon et al., 2011; Alkon & Mares, 2012).

Agroecology

Agroecology is often referenced as a scientific discipline, agricultural practice, and a social and environmental movement (Holt-Giménez & Altieri, 2013; Wezel et al., 2009). Emerging partially in response to the effects of the Green Revolution technologies on farming structures, it became recognized by scholars in the 20th century. Agroecology is rooted in traditional practices and indigenous knowledge. It values agroecology management as the application of ecology to agriculture over external inputs and capital-intensive agriculture practices (Holt-Giménez & Altieri, 2013).

Due to the intensification of agriculture and the integration of the Green Revolution technologies in the 1970's, many small-scale farmers were negatively impacted as the structure of farming transformed to grow more food on a given piece of land. Many of these smallholder farmers turned to agroecology as an agricultural practice, in efforts to restore their land (Altieri, 1989; Holt-Giménez & Altieri, 2013). Agroecology as an agricultural practice provides farmers an alternative to high input, chemical intensive agriculture by providing conservation of natural resources, soil fertility management, restoration of agrobiodiversity, and pest management (Altieri, 1989; Holt-Giménez & Altieri, 2012; Ray et al., 2021; Wezel et al., 2009). It provides a holistic approach and understanding to natural environmental cycles in farming and recognizes the need for farming systems to be adaptive. Employing agroecology as an agricultural practice facilitates the opportunity for local food systems to center local knowledge and promote social and environmental justice (Ray et al., 2021). Its use also supports maintaining a diverse farming system better able to respond to extreme climatic events since part of the ecosystem is more resilient to these occurrences.

Agroecology is also often used as a framework and vision for movements. The environmental movement in the U.S. in the 1960s was primarily focused on the impact of toxins, in particular pertaining to agriculture and its utilization of pesticides and its impact on human health and the environment. Rachel Carson published her book ‘Silent Spring’, which provided a critical perspective on the relationship between science, agriculture practices, and the environment (Carson, 1964). By providing an ecological and health critique, Carson was able to contextualize and provide a new cultural framing of the utilization of new pesticides within the existing optimism of technology, progress, and development. Another substantial benefit of using agroecology is that it creates a pathway toward food sovereignty.

Several scholars and food movement leaders have warned and cautioned about the threat of agroecology being co-opted (Anderson et al., 2020; Ernesto Méndez et al., 2013; Holt-Giménez & Altieri, 2012; Wezel et al., 2009) They have offered a critical perspective on what can constitute agroecology's “sustainable intensification techniques” versus what can be considered the “greening” of the industrialized agricultural model. So, the use of agroecology can benefit us by providing a whole system analysis and framework to transform our food system.

Summary

The analysis of our current food system requires situating the interconnected factors of agricultural production in contemporary and historical context. In this chapter, we outlined a brief history of agricultural production in the U.S., and we highlighted several threads that connect production, distribution through global markets, and their impacts on our current food system and the environment. We also outlined key demographic, health, and social trends among

farmworkers. Although our food system may seem to be adaptive to the numerous externalities it faces, e.g., increasing need for more food products, many of these ‘adaptations’ have been substitutions or temporary technological interventions. We provided an overview of the agricultural and food models that can serve as a framework for creating a more sustainable and equitable food system that does not exploit farmworkers or jeopardizes the environment.

Farmworkers and their families face significant challenges at multiple levels. This chapter has presented numerous examples contending that many of the adverse experiences the farmworkers and their families have endured can be attributed to the corporate domination of the agricultural industry. Our food system is vulnerable and cannot be secure until farmworkers and the environment are healthy. The next chapter will discuss the methodologies utilized in this project, which are grounded in community-based participatory research.

CHAPTER 3: (METHODS) THE STORY OF TWO ASSESSMENTS “NOTHING ABOUT US, WITHOUT US”

Despite the critical role farmworkers serve in our current food system, they continue to be disproportionately impacted by cumulative social and environmental factors resulting from farming practices used to increase yields and ensure the vitality of the food supply chain.

Farmworkers are often disenfranchised and have the limited ability to influence or modify the farm practices that directly impact their health and the health of the environment. Our current food system model often considers these impacts as environmental externalities and, as a result, are not prioritized.

In addition, consumers and the general public are often unaware of the food production systems that ensure food supply in their grocery stores. The lack of awareness regarding the U.S. food system's issues is compounded by the ignored experiences of the workers across the food supply chain. Consequently, this disconnection and lack of understanding result in a false paradigm that our food system is secure. This dominant narrative is driven and propagated by the corporate food regime and the stories generated by the distribution chains that benefit from the farm practices and the farmworkers' labor.

Difficulty overcoming and addressing these issues requires the characterization of these factors. Many of the challenges faced by farmworkers are interrelated. They will require a holistic socioecological approach to assess and characterize the impact of our current food system on farmworkers and agricultural communities. This assessment will require the inclusion and participation of farmworkers who are directly impacted. Historically the voices and experiences

of farmworkers have been excluded from the conversations and decisions that directly affect their health. As a result, farmworkers have not been able to tell their story in their own voice. Without data from a holistic assessment and the participation and inclusion of farmworkers' voices and experiences, our food system is at risk of collapsing. In addition, consumers will continue to be unaware of the impact of their food consumption decisions. This knowledge and information are critical for creating a more sustainable, secure, and equitable food system.

This chapter will discuss the theoretical framework (i.e., social ecological model) and research approach (i.e., community-based research). The project design included forming the community-academic partnership to learn the knowledge held by the farmworkers. It will describe the two phases of data collection methodologies grounded in community-based participatory research (CBPR): (1) implementation of a pilot-scale community farmworker survey; and (2) facilitation of farmworker digital storytelling workshops.

Theoretical Framework: Social Ecological Model

The social ecological model (SEM) is a theory-based framework that is often used as a conceptual approach in public health research and interventions. This framework was first introduced by Bronfenbrenner, a psychologist in the early 1970s (Bronfenbrenner, 1979). This model recognizes that people (individuals) are both influenced by and influence their environment (Golden & Earp, 2012). It focuses on the multilevel influences across layers such as individual, interpersonal, community, organization, and public policy (Golden & Earp, 2012; Marshall, 2015; Stokols, 1996; *The Social-Ecological Model: A Framework for*

Prevention|Violence Prevention|Injury Center|CDC, n.d.). This framework is widely used with numerous iterations of adapted SEM models (See Table 4).

Table 4: Social Ecological Model (SEM) levels with descriptions of each. (Golden & Earp, 2012; Marshall, 2015; Stokols, 1996; *The Social-Ecological Model: A Framework for Prevention|Violence Prevention|Injury Center|CDC, n.d.*)

SEM Level	Description
Individual	This level examines characteristics, knowledge, attitude, beliefs at an individual level. Includes: age, race/ethnicity identity, goals, values, literacy, and economic status
Interpersonal	This level examines the formal and informal social networks and social support systems that can influence individual behaviors. Includes: families, friends, social networks, customs, or traditions
Community	This level examines the community level relationship and interactions between organizations, institutions, and networks. Includes: the built environment (e.g., parks), community leaders, and transportation
Organizational	This level examines the operations and rules of formal and informal organizations or social institutions. Includes: schools, state/local health departments, community-based organizations (CBOs)
Policy	This level examines the local, state, national and global policies and regulations that determine allocation of resources and services. Includes: Social and health promotion and prevention programs, health policy and regulations, policy makers and elected officials

When utilized as a conceptual approach, the SEM offers an opportunity to assess and understand the determinants that influence an individual's health by recognizing there are connections and interactions between these various layers. This model provides a lens to explore the relationship between people and their social, physical, and political environments, by providing a more holistic understanding on the factors that impact health. Stokols argues that the social, physical, and cultural aspects of an environment can have a cumulative effect on an individual's health (Stokols, 1996). This study utilized the SEM as a framework in the research design and data analysis. This framework was utilized to assess and characterize the impacts of the food system on farmworkers.

Despite being an integral part of the food system, farmworkers and the agricultural community experience significant health disparities and environmental inequalities (Hoerster et al., 2011; Whitesell et al., n.d.). Health disparities are in part due to the cumulative impact of environmental exposures, occupational risks, socioeconomic and political vulnerabilities, and other structural and systemic barriers (Mac & McCauley, 2017; Morello-Frosch et al., 2011). To create a food system that is secure and ensure the safety, health, and wellbeing of farmworkers will require science and policymakers to explore the complexities and interconnections that exist within our current food system. Furthermore, to advance environmental justice and health equity, we must ensure that communities who are disproportionately impacted are included in the research, the decision-making processes, and the solution development.

Research Study Design: Integration of Community in Research

Community-based participatory research (CBPR) is better understood as an umbrella term for participatory research approaches rather than a singular method. Other names used for participatory approaches in research include action research, participatory action research, collaborative research, community engaged research, and popular education (Stoecker, 2011; Wallerstein & Duran, 2010). These approaches emphasize equitable community participation in all stages of research, including the development of research questions, research design, implementation, data analysis, dissemination of findings, and action (Israel et al., 1998). In a CBPR project, community members and other stakeholders are recognized as valued and respected partners, and not as members that should be brought to the table when all the decisions have already been made. Many studies have found that the flexibility and practicality of CBPR tools and methods appeal to communities as they are often able to select a tool or method that best meets their needs (Cochran et al., 2008; Lantz et al., 2001; Minkler, 2004). High level of engagement from community partners is possible when the research process, including communication and research methods, are compatible, inclusive, and responsive to the community partner's needs and preferences (Belansky et al., 2011; Minkler, 2004).

The key principles of CBPR can help serve as a guide in research projects; however, they should be adapted and modified to meet the population and community needs. Each community is different and have unique circumstances that determine what factors are relevant and drive the community decision-making process.

Key Principles to Community-Based Participatory Research (*Developing and Sustaining Community-Based Participatory Research Partnerships: A Skill Building Curriculum*, 2018)

- Recognizes community as a unit of identity
- Builds on strengths and resources within the community
- Facilitates collaborative partnerships in all phases of the research
- Integrates knowledge and action for mutual benefit of all partners
- Promotes a co-learning and empowering process that attends to social inequalities
- Involves a cyclical and iterative process
- Addresses health from both positive and ecological perspectives
- Disseminates findings and knowledge gained to all partners

Community Participatory Action Research (CPAR)

Through the formation of our community academic partnership, this project was able to incorporate the active participation of our community partners and support their efforts to address disparities experienced by farmworkers. Community Participatory Action Research (CPAR) recognizes the importance of having community-led efforts and values the knowledge held by communities in which the research is conducted (Baum et al., 2006). One of the core aspects of CPAR is the use of the research process to generate knowledge (i.e., data, findings, etc.), while actively seeking to change or address issues (Cargo & Mercer, 2008; Stoecker, 2011). Community-based organizations who would like to conduct their own data collection programs are faced with challenges related to validity and credibility, CPAR and community-academic partnerships can help address these challenges. An example of action can be the

implementation of community assessments to develop community-driven solutions to address inequities and concerns in communities, which was one of the project's outcome goals.

Often *research* and *action* are seen as being mutually exclusive of each other. In the textbook '*Research Methods for Community Change*', Randy Stoecker describes the challenges and limitations faced by community and academics in conducting research to affect change (Stoecker, 2011). Stoecker describes the differences in how academics and practitioners see the relationship between 'action' and 'research' (See Figure 2). In this example, he explains that academics often prioritize the 'research' process over 'action' or direct research impact (Stoecker, 2011). Further he explains the academic research process as being limited due to being driven and directed by project aims and goals, which often pre-determine the data collection methods and how data will be analyzed and utilized. Consequently, this limits the potential for action since community issues or problems may not be really addressed in the research (Stoecker, 2011).

Contrary to academics, practitioners (i.e., community organizations, stakeholders etc.) prioritize 'action', given their proximity to community issues and the importance in addressing community concerns (Stoecker, 2011). CPAR provides us with a unique framework and guidance to help merge "research" and 'action' (See Figure 2). For example, the three core elements in CPAR include the project being useful, including diverse methodologies, and emphasizing collaboration (Stoecker, 2011). Community-academic partnerships can help reduce the gap between research and community practice (Drahota et al., 2016).



Figure 2: Diagram of the relationship between Research and Action as viewed by Academics or Practitioners. (Stoecker, 2011)

Community-Academic Partnerships

Community-academic partnerships are effective in addressing population-based disparities and promoting health equity and environmental justice (Arcury & Quandt, 2020; Drahota et al., 2016). The engagement of trusted community leaders in research can help facilitate the interaction with vulnerable and ‘hard to reach populations’ such as farmworkers (Balazs & Morello-Frosch, 2013; Drahota et al., 2016; Minkler, 2004). Community-academic partnerships can help identify critical knowledge and information that can enhance cultural and contextual understandings of underlying factors that impact communities (Cargo & Mercer, 2008; Minkler, 2004). In addition, these partnerships can improve research feasibility, increase accuracy in the interpretation and dissemination of findings, and facilitate the potential for turning research into action (Cargo & Mercer, 2008; Minkler, 2004).

Building and sustaining mutually beneficial community-academic partnerships is the foundation of CBPR and CPAR projects. An ideal community-academic partnership would foster cultural humility, respect, and equitable value of the partner's knowledge. Acknowledging and addressing the power imbalances that may exist between community and academic researchers is essential. The level of involvement and role of each partner and stakeholder needs to be re-evaluated throughout the research process. When communities are viewed as valuable and equal partners, the quality of research practice, sustainable solutions, and community resiliency can be increased.

Research Study Design

This dissertation is part of a larger community-academic research project, "Addressing Health Disparities Faced by Rural Underserved Communities." This project emerged from the mutual interest of both community leaders at Community to Community (C2C)¹ and researchers at the University of Washington (UW), who were interested in understanding, characterizing, and addressing the cumulative social and environmental factors that impact farmworkers health and well-being. Data from this project were used by the community organization to further food and farmworker justice policy efforts.

This project utilized elements and principles of CBPR and CPAR to build a community academic partnership between the university and C2C. These groups met regularly during the research process to establish and review roles, expectations, and to ensure the research process

¹ Community to Community (C2C) work is informed by the community organizing model of Cesar Chavez and the principles of the World Social Forum. C2C nurtures and resources frontline community leadership and activates it regionally, nationally, and globally. Agricultural communities with support from C2C are organizing themselves into a powerful collective force becoming leaders, changing structural power, and transforming health and safety into a just system.

was inclusive of community members. This was an essential process in the early phases of the project as it facilitated trust building, communication methods, and research design. Similar to other community-based research projects, our community partners were integral in participant recruitment, facilitation/implementation, and dissemination of results (Makosky Daley et al., 2010).

To conduct a holistic assessment of the social and environmental impacts on farmworkers this project utilized the SEM framework and CPAR elements in the research design incorporation of diverse methodologies, and the data analysis. Through a community-based participatory research approach, this project implemented a two-phase data collection process including Phase One implementation of pilot-scale community farmworker survey (n=348); and Phase Two facilitation of farmworker digital storytelling workshops (n=18). (See Figure 3)

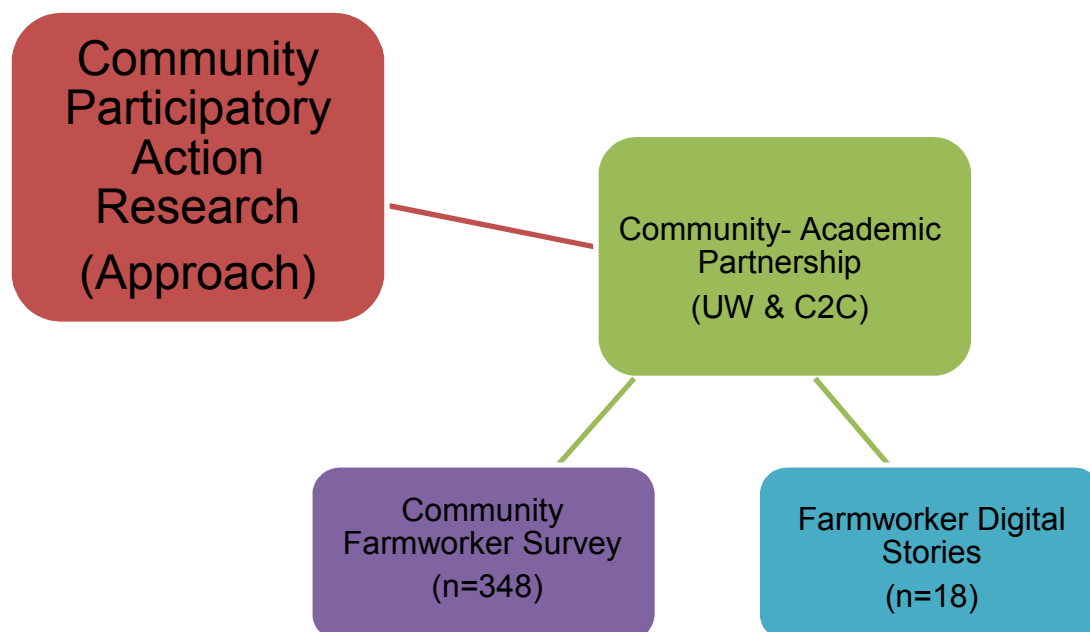


Figure 3: Diagram of the 'Data Collection' approach.

Participant Inclusion Criteria

Through a targeted and snowball recruitment process supported by our community partner, participants for this project (for both data collection phases) were recruited based on the following co-developed participant criteria. Participant eligibility criteria:

- Participants must be 18 years or older
- Must be a current farmworker or previous farmworkers (within 5 years)
- Currently live in Skagit or Whatcom County
- Speak English or Spanish

Phase One: Community Farmworker Survey

The first phase of this project included the co-development and implementation of a pilot-scale community farmworker survey in Skagit and Whatcom County. During the project, the research team and members of the community organization met to develop survey and data collection instruments, establish data collection plans, and develop an approach to reporting results and designing products. These regular meetings were critical for strengthening the community academic partnership. The design of this survey assessment used the SEM as a framework to assist in characterizing the complex social and environmental injustices affecting rural agricultural communities, in particular farmworker communities. [See Appendix C for Survey]

The questions in this survey were co-developed alongside our community partner to ensure cultural appropriateness and that the questions met community needs and interests. Selected questions from the National Agricultural Workers Study (NAWS) were integrated after being reviewed and approved by our community partner. The NAWS survey is conducted across the country and is one of the only national data sources for information on migrant and seasonal

farmworkers (*National Agricultural Workers Survey* | *U.S. Department of Labor*, n.d.). The community farmworker survey question key is given in Table 5.

Table 5: Community Farmworker Survey Question Key based on themes and topics of the questions.

Theme	Question Topics
Population Demographics	Gender, Age, Ethnicity, Language, Education
Employment Characteristics	Longevity Of Ag. Worker Status, Ag. Worker Status, Migration, Work Compensation (i.e., Piece, Hourly), Type of Ag. Work (i.e., Crop and Work Assignment), Annual Income
Occupational Health	Access To Safe Drinking Water, Healthy Home Environment (Housing in Good Condition), Sexual Harassment, Dehydration/Heat Illness, Ladder Safety, Slips, Trips, & Falls, Injury Caused by Machinery, Muscular Strains/Sprains, Exposure to Pesticides, Work Shifts & Fatigue, Eye Injuries/Hearing Conservation, Worker Rights, Personal Protective Equipment, Animal Handling Safety, Injuries & Reporting
Housing Characteristics	Type of Housing, Conditions of Housing, Location, Number of Household Members
Environmental Concerns	Air Quality, Wildfires, Ammonia, Water Quality
Access To Health Care and Community Resources	Access to Health Care, Community Assets (i.e., Green Space, Community Centers), Social Services, Food Accessibility, Built Environment

Survey Collection Capacity Building

The community partner (C2C) identified local trusted Promotorxs (community members) to be trained as community interviewers. Research staff from the university facilitated data collection training workshops, during which a total of 12 Promotorxs were trained. Training was provided

prior to data collection and was held over three days. The bilingual (Spanish and English) training incorporated popular education techniques including role-play and community asset mapping for identification of recruitment locations. Training topics included data collection and data download, introduction to REDCap, participant consent and confidentiality, and the use of technology (i.e., tablets). REDCap is a free research tool offered through the participating academic institution. During the data collection period, research staff met with Promotorxs weekly to provide on-going training support, technical assistance, debrief, and support other data collection needs and efforts.

Community Farmworker Survey Format

The survey was administered by locally trusted community Promotorxs. Survey data were collected using REDCap. Promotorxs administered in-person surveys in English or Spanish (as preferred by participants) and collected information via tablet computers and paper surveys. The duration of each survey was approximately 45-minutes to 1 hour. Surveys were conducted at public community spaces, such as grocery stores (meat markets), laundromat facilities, parks, community centers, libraries, churches, and community gatherings. A limited number of surveys were conducted in participants' homes. It is important to note that no participant was recruited through an employer and no survey was conducted at a worksite.

Phase Two: Farmworker Digital Storytelling Workshops

Digital storytelling is a novel research method used in community engaged research. As a bottom-up approach, the participatory storytelling process allows for the researcher to assume the role of an advisor and the community member as the primary participant or storyteller. This

method can increase the participation of community members in community action and solutions regarding local issues (de Jager et al., 2017; Gubrium, 2009).

The process for developing first-person narratives is rooted in *testimonio*. *Testimonio* is both a product and a methodological process (Blackmer & White, 1998). It has historically used a storytelling approach that originated in Latin America to convey the experiences of people who were persecuted and oppressed by systemic and structural forces (Avant-Mier & Hasian, 2008; Blackmer & White, 1998). *Testimonios* are a powerful form of “truth-telling and justice-seeking” (Caxaj, 2015).

Testimonios are individually informed, centered on specific place-based knowledge, and incorporate political, social, and cultural histories that exist in one's life (Delgado Bernal et al., 2012; Denzin & Lincoln, 2008). Other forms of autobiography and oral histories are often developed by the participant working independently or individually, and often the interviewer gathers and prepares the presentation and telling of the story (Benmayor, 2012). Conventional digital storytelling often shares a similar process; however, the emphasis is on the use of digital technology to tell the story (Benmayor, 2012). Digital *testimonios*, however, involves a collective collaboration through the critical reflection of one's lived experiences alongside peers or community. The emphasis is on the development of *testimonios* (story) and the medium for telling the story is digital (Benmayor, 2012; Delgado Bernal et al., 2012). Through the participatory process of story development, researchers are able to engage with participants, build capacity, and create a space for stories to be shared (Briant et al., 2016; Cueva et al., 2013). The digital storytelling process can also serve as an intervention as it provides the opportunity

for participants to critically engage and reflect on their experiences in their workplace, home, and environment, and explore what it means to be healthy as a community (Fletcher & Mullett, 2016).

The use of digital stories is a beneficial and powerful tool for communities of color and lower socioeconomic status to share their personal stories and experiences (Briant et al., 2016; Gubrium, 2009; Gubrium et al., 2018). Vulnerable populations like farmworker communities are marginalized, disenfranchised, and often do not have the opportunity or platform to share their lived experiences. By placing the power and control of the narration, writing, and editing of their own stories, digital storytelling *testimonios* invite the participant to critically reflect on their personal lived experiences within the sociopolitical realities that exist for them and impact the story they tell (Delgado Bernal et al., 2012). *Testimonios* promote emotional engagement through the participant's visual and emotional interpretation (Carlson et al., 2006; Lambert et al., 2010; Lambert & Hessler, 2018). The integration of *testimonio* and multimedia visuals provide an opportunity for farmworker stories and narratives to be shared in a visual and compelling way with wider audiences.

Digital Storytelling Workshop Capacity Building

Preparation for the farmworker digital storytelling workshops required hands-on experience in digital storytelling development and facilitation. Through the mentorship of Dr. Jane A. Van Galen, founder of *First in Our Families*² digital storytelling project, I (the graduate student), along with the other farmworker digital story workshop facilitators, was able to connect with the

² First in Our Families- Digital Stories of First-Generation Students <https://firstinourfamilies.org/>

digital storytelling community for guidance and support. As the primary workshop facilitator, I attended a six week online digital storytelling workshop through the Story Center³. This workshop held sessions every week and focused on the development of a personal digital story. The digital story developed helped serve as an example of a personal digital *testimonio* for the farmworker digital story workshop sessions.

To gain experience in facilitation and technical practice, I was invited to co-facilitate two separate digital storytelling workshops. Through these experiences, mentorship, and support, we were able to build our own procedures and framework for the farmworker digital storytelling workshops.

To promote community capacity in digital storytelling, a bilingual digital storytelling facilitators guide was developed and shared with our community partner organization. Three Promotorxs were trained in digital storytelling facilitation. The training consisted of digital story development, script writing, storyboarding, and technical support (i.e., tablet, digital video editing, audio). Throughout the duration of the farmworker digital story workshops (approximately four months), on-going training support, technical assistance, data collection support, and participant recruitment support was provided through weekly debriefing sessions with all Promotorxs.

Digital Story Workshop Format

³ Story Center <https://www.storycenter.org/>

The farmworker digital story workshop was modeled after the Story Center Digital Storytelling Workshops and the First in Our Family project. Both workshops utilized the Seven Steps of Digital Storytelling developed by the Story Center (See Figure 4) (Lambert et al., 2010). This framework was culturally adapted and translated to meet the needs of the farmworker digital storytelling workshop participants.

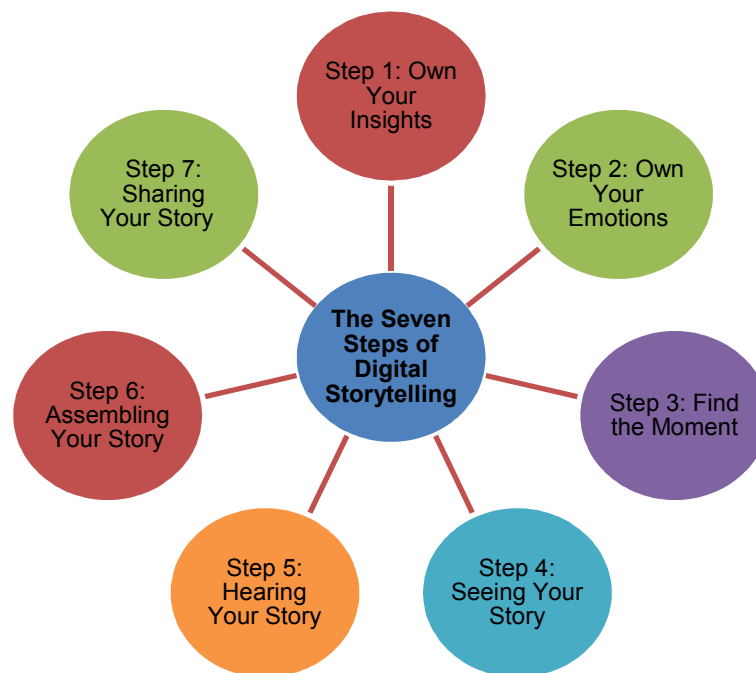


Figure 4: The Seven Steps of Digital Storytelling. (Lambert et al., 2010)

Digital Story Workshop

The farmworker digital story workshop was co-facilitated as part of my research alongside trained Promotorxs. It was held over three consecutive days (approximately 6 hours per day). The first day consisted of an introduction to the project and each other, trust building activities, the introduction to the Seven Steps of Digital Storytelling, photo-walk activity, and story circle. The second day consisted of the composition of *testimonio* (script), technology tutorials, and

drafting of visual storyboards. The third day was primarily focused on putting together all the elements of digital storytelling, finalizing the digital story, and collective public screening of all workshop participant stories. Facilitators helped participants create their own digital story by providing support in the development of their personal narrative and technological/editorial support. Each farmworker digital storytelling workshop hosted 5-7 participants.

Digital (*Testimonio*) Storytelling Elements

Digital Stories are 3-to-5-minute first-person narratives (*testimonio*) with multimedia visuals that synthesize images, video, audio-recordings, music, and text (Cueva et al., 2013; Gubrium et al., 2018; Moreau et al., 2018; Willox et al., 2012). In the following section we will review the elements of digital storytelling and the approach we used to support participants (farmworkers) in the development process to facilitate and capture stories.

Finding Their *Testimonio*/ Story (Script Writing)

The participants' *testimonio* “story script” is the most crucial element of their digital story. The primary focus of the digital storytelling workshop is to help support the development of each farmworker's *testimonio*. They are encouraged and reminded of the power they hold in owning their stories and experiences. Gathered in a circle, participants share their ideas and aspects of their lived experiences. Facilitators support participants by prompting them with various questions while gathered as a collective group and during one-on-one meetings.

Prompting questions:

- “*What experiences or story would you like to share? What happened and why do you think this might have happened?*”
- Participants are encouraged and reminded, “*What story can only you share? Why is it important to share this story now?*”

The intention for prompting participants is to encourage them to begin to reflect on their lived experiences. The actual process of writing and composition of their *testimonio* varied in this group. With different types of learners, varied literacy levels, and creativity, each participant had their own method for developing their *testimonio*. Some participants wrote a script, others had a facilitator transcribe their script, and others used a storyboard with drawn images or photographs that prompted their own individual story. Throughout the development process, participants were able to share their *testimonio* during story circle and individually with facilitators.

One of the objectives of digital *testimonio* and digital storytelling is to raise critical consciousness, evoking a call to action by sharing one’s *testimonio* with others (Blackmer & White, 1998). The narration (audio recording) of their *testimonio* is one of the most important dimensions of digital storytelling. As Rina Benmayor states, “No longer an edited transcript to be read, the *testimonio* is now in the voice of the subject, speaking directly to the viewers, and asking us to listen.” (Benmayor, 2012).

Technology and Multimedia (Photos & Video)

The technological production and composition of digital stories was adapted to meet the needs of each participant. Participants were not required to have any technological experience or digital skill to participate in the farmworker digital storytelling workshops. Facilitators were available to support each participant one on one.

The utilization of tablets rather than computers (i.e., laptops or desktops), made the production process flexible and encouraged participants with various digital literacy skills to participate. Participants were given introductory tutorials in photoshopping, searching the internet for image and multimedia, and the video editing application. A brief introduction and overview of copyright and creative commons media was shared with participants; however, participants were encouraged to use original images or to take photos with the tablets.

Bringing their story to life

As a viewer, we are often focused on the final product of the digital story created; however, the digital story development process is very meticulous and emotional for each participant. The emphasis throughout the workshop is to remind participants that this is their story and that they get to choose how, what, and how much they share. Only they can tell their unique story.

To practice taking photos and to encourage participants to utilize imagery to convey emotions through their stories, we held a “photo walk”. This activity is one that was adapted from the *First in Our Families* workshops. Through a brainstorming activity, participants were asked to list the name of emotions that come to mind when they think about their personal lived experiences. From this list, participants were asked to choose 2-3 emotions and take a photo and capture an image that represents those emotions. The group then was encouraged to walk outdoors (weather permitting) and practice taking photos. Images and the ‘photo walk’ activity were debriefed as a collective. The images captured during this activity have been extremely helpful for participants

who may not have a personal photo or choose to not include personal photos. Many participants chose to integrate the photos captured during this activity in their digital stories.

An example that was provided to participants for this activity was the emotion ‘loneliness/isolation’. A photo of a tree standing by itself was shared. Through the photo-editing process, we also taught participants how to convert this photo to black and white. The emotion that is conveyed through the image of the tree is one that can transcend language, cultural, and generational differences. The power of showing an emotion rather than telling is the essence of digital *testimonio*.

Story Circle

The farmworker digital storytelling workshops followed the story circle model utilized by the Story Center, in which participants had the opportunity to share their stories and experiences with each other (Lambert et al., 2010). The story circle model facilitates the process for participants ‘opening up and sharing’ within a group setting, validating their ideas and resonance to each individual’s life stories and experiences (Lambert et al., 2010). Each participant was given the space and time to share their life stories, and everyone, including facilitators, were asked to provide a comment. The process allows both the facilitators and participants to be at an equal standing, where all stories are important and significant to the purpose of storytelling (Lambert et al., 2010). Prior to the first story circle, group norms were established and agreed upon by all participants. Story circle is one of the most meaningful and essential aspects of the farmworker digital storytelling workshop.

Digital Story Workshop Location

The three-day farmworker digital storytelling workshop was held in the community partner offices. The participants were familiar with these locations, and many had previously visited these spaces to access a variety of services and activities. Due to the different activities that were part of the workshop, it was important to have multiple office spaces available.

The large room (community room) had a circular table with enough space and chairs for all participants and facilitators to gather around. This room was primarily the workshopping and gathering space. This was one of the most important spaces, as participants were able to gather, talk, eat, and support each other. A second room was used primarily for voice audio recording. This room held the recording equipment and makeshift audio booth. In addition, there was ample space outside the two primary rooms and outdoors. These spaces were important for participants to be able to write and reflect in solitary or to walk and capture photos for their digital stories.

Ethical Considerations

The recruitment communication with participants consisted of describing the purpose of the farmworker digital story workshop, what to expect during the workshop days, the time commitment required, how their digital *testimonio* may be shared in the future, and responses to any other questions. Participants were reminded they had the choice to participate and end their participation at any point in the workshops.

The product of the farmworker digital story workshops was a digital *testimonio*. This digital *testimonio* could contain identifiable information including images, voice, video, or identifying details (i.e., names, locations, employer names). The facilitators of this workshop discussed the

options for participants to protect their identities, by creating a digital *testimonio* that would not contain identifiable information. Participants were reminded they had the choice to use pseudonyms or omit information to protect their privacy and safety. Other options provided included not using images with people in them, and/or having someone else do the voice recording. Participants were reminded they had the autonomy to tell their story however they preferred.

After the screening of videos, participants were asked to complete a “Participant Digital Story Release Form”. This document described the options for participants to authorize the use of their digital story if they wanted to allow the use of their digital story. [Appendix D]

This project received IRB approval through the participating academic research institution [See Appendix A Ethics Approval]. All participants were provided a copy of the written informed consent prior to the participation in both data collection phases [See Appendix B Informed Consent]. Communication with farmworker participants was managed by our community partner.

Data Analysis Approach

Due to the variation in data collection methods and variables collected, we applied the following data analyses approach. Descriptive statistics were used to analyze participants’ demographic characteristics collected through the community farmworker survey.

Thematic analysis was used to analyze the qualitative data, including the open-ended responses from the community farmworker survey and farmworker digital story data (i.e., storyboard and script). First, qualitative data were transcribed and translated (i.e., Spanish to English, Mixteco to Spanish to English). Transcripts were reviewed with our community partner for accuracy and to generate initial thematic code ideas. Secondly, using the SEM framework, potential thematic codes and definitions were integrated into the preliminary codebook. Three transcripts and their final farmworker digital stories were initially reviewed one-by-one by primary and secondary qualitative data coders. *Dedoose* software was used to apply codes to interview excerpts. Preliminary codes were systematically applied, and sub-codes were generated.

Following the methods outlined by Braun and Clark, codes were then categorized into potential themes and reviewed by both coders to reconcile discrepancies (Braun & Clarke, 2006). The next step was to finalize the thematic codebook with code names along with their definitions.

Following the finalization of the codebook, the primary coder then systematically reviewed each transcript and farmworker digital story and applied thematic code for analysis. Once data were coded, the primary coder reviewed codes and began to illustrate the relationships between codes.

In addition, the following questions were used to help frame the interpretation of findings:

- *What patterns and common themes emerged among the data collected through different methods?*
- *How do these patterns (or the lack of them) help to answer the research question(s)?*

Summary

In conclusion, this chapter addressed the methodology of this project, including the theoretical framework, research approach, and data collection process. It was crucial that the farmworker

stories be told by themselves in their own voice. This made it especially challenging since the research design and process had to be carefully figured out. The farmworker digital storytelling process followed was effective in letting farmworkers tell the stories they wanted to tell. This process minimized the potential for researchers to influence or impact what stories were told. This is very different from the typical storytelling approaches used, since most of those approaches provided the technological tools and allowed you to tell any story you want. However, in this research, it was important to capture the voices and experiences of the farmworkers in an unfiltered manner. These stories are often not heard or given the space and credibility they deserve as they are often considered externalities to the food production systems. These stories, paired with the Community Farmworker Survey data, provide an opportunity to assess and gain new insight into the impacts of our current food systems. This perspective has been missing from most stories written and shared about agriculture and food security, which traditionally exclude the voices and experiences of farmworkers. The next chapter will describe the relevant findings of the study.

CHAPTER 4. RESULTS: THE (UN)HEARD STORIES

The purpose of this study was to examine our current food system model by assessing and characterizing the present cumulative social and environmental factors that impact farmworkers. Through a community-academic partnership between the University of Washington and Community to Community (C2C), this project sought to better understand farmworkers' experience in Skagit and Whatcom counties located in Washington State. This chapter will present the findings from this study which utilized a two-phase data collection approach. The findings are presented in the sequential order data were collected beginning with the Phase One results of the community farmworker survey (n=348) followed by the Phase Two findings from the farmworker digital stories (n=18).

Phase One: Community Farmworker Survey Results

The common themes that emerged from the data collected through the piloted community farmworker survey are divided into three categories 1) participant demographics, 2) employment & occupational health characteristics, and 3) social and environmental characteristics.

Participant Demographics

A total of 348 surveys were conducted in the community with farmworkers by trained Promotorx (community members). There were about equal numbers of male (50.1%) and female (49.9%) participants, with most participants being between the ages of 25 to 44 (55.5%). Nearly most participants self-identified as being Hispanic or Latinx (98.8%). About 40 percent of participants self-identified as being indigenous from outside the U.S., primarily from Latin America. Of

those who reported being indigenous, 76 participants responded with a specific indigenous group being Mixtec (35.5%), Trique (39.5%), and others (25%). (The 'others' category for indigenous groups included Aguacateco, Mam, Maya, Aztec, Cora, Kanjobal, Nahuatl, Zapotec, Mam, Purepecha, and Tarasco.) The primary spoken languages reported by participants included Spanish (70.7%), Trique (12.5%), and Mixtec (6.4%). Participants had low levels of formal educational attainment as nearly 70 percent had completed less than high school education. Almost half of all the participants reported earning an annual income of less than \$20,000. The demographic characteristics of participants are presented in Table 6.

Table 6: Pilot-Scale Community Farmworker Survey Participant Demographics (N=348)

VARIABLES	n (%)
Sex (n=347)	
Male	174 (50.1)
Female	173 (49.9)
Age (years) (n=348)	
18-24	54 (15.5)
25-44	193 (55.5)
45-64	97 (27.9)
Older than 64	4 (1.1)

VARIABLES	n (%)
Hispanic/Latinx (n=347)	339 (98.8)
Indigenous Outside of U.S. (n=321)	127 (39.4)
Indigenous Group* (n=76)	
Mixtec	27 (35.5)
Trique	30 (39.5)
Other: Aguacateco, Mam, Maya, Aztec, Cora, Kanjobal, Nahuatl, Zapotec, Mam, Purepecha, Tarasco	19 (25.0)
Primary Language (n=345)	
Spanish	244 (70.7)
Trique	43 (12.5)
Mixtec	22 (6.4)
English	19 (5.5)
Other: Bilingual, Mam, Kanjobal, Zapotec, Nahuatl, Aguacateco	17 (4.9)
Educational Attainment	
Did Attend School	20 (5.8)
Primary School	132 (38.5)
Middle School	83 (24.2)
High School	86 (25.1)
Some College/ College Degree	22 (6.4)
Annual Personal Income \$20,000 or less	141 (46.5)

**Question was only asked if participant responded they were indigenous (n=127)*

Employment & Occupational Health Characteristics

Farmworkers surveyed had extensive work experience in agriculture and seemed to be year-round residents of Washington state. Over 40 percent of participants reported having ten or more

years of experience working in agriculture in the U.S., and most participants worked for the same employer every year (70.6%). Nearly 70 percent of participants responded they would not leave Washington state at the end of the growing season. Nearly one-third of the participants reported working seven days a week, and more than half of the participants worked between 9-12 hours per day (54.4%) during the growing season. (See Table 7)

Table 7: Employment Characteristics (N=348)

VARIABLES	n (%)
Number of Years Working in Agriculture in the U.S. (n=348)	
Less than 1 year	23 (6.6)
1 to 2	26 (7.4)
3 to 5	87 (24.9)
6 to 9	66 (18.9)
10 or more years	145 (41.5)
Employer during the year in Washington State (n=343)	
First time working in Washington State	23 (6.7)
Same Employer	242 (70.6)
Different Employers	78 (22.7)
Number of Days Worked in the Past Week (n=342)	
No	239 (70.5)
Yes: Work in another state	87 (25.7)
Yes: Back to home country	13 (3.8)
Hours Worked Per Day (n=340)	
0-8	140 (41.2)
9-12	185 (54.4)
12 or more	15 (4.4)

The most common crop industries reported were berries (58.1%), dairy (12.6%), food processing/cannery (10.8%), and greenhouse/plant nurseries (6.9%). The majority of berry workers picked and harvested berries (88.9%), and nearly half of the berry workers were paid a piece rate. Dairy, processing/cannery, and the greenhouse/plant nursery workers all performed many different tasks. Over 90 percent of dairy workers were paid by the hour or work shift (92.7%). The majority of processing/cannery (91.7%) and greenhouse/plant nursery workers (100%) were paid by the hour. (See Table 8)

Table 8: Crop Type: Task and Payment (N=348)

n (%)	Berries 194 (58.1)	Dairy 42 (12.6)	Greenhouse/ Plant Nursery 23 (6.9)	Food Processing/ Cannery 36 (10.8)
Main task	Pick/harvest: 169 (88.9)	Milking: 25 (59.5)	Planting: 20 (87)	Sorting: 24 (66.7)
Payment				
Hourly	81 (38.8)	28 (68.3)	23 (100)	33 (91.7)
Piece	91 (49.7)	1 (2.4)	0	2 (5.6)
Hourly + piece	17 (9.3)	0	0	0
By shift	NA	10 (24.4)	NA	NA
Salary	NA	2 (4.9)	NA	NA

Access to Work Amenities

When asked about conditions at work, participants reported experiencing inadequate access to rest, shade, and amenities in their workplace. Over 20 percent of participants reported never having access to shade in the work field, and over 40 percent don't always have access to regular breaks. In addition, about 20 percent of participants do not have consistent access to drinking water, and nearly 10 percent say they sometimes or never have access to a toilet. Overall,

participants reported having unsanitary conditions on the job. Participants commented on the issues and concerns regarding the amenities or lack of access to amenities in their workplace.

Table 9 describes the responses from participants regarding access amenities at work.

Table 9: Access to Amenities at Work

AMENITY	ALWAYS	SOMETIMES	NEVER
Shade (n=348)	187 (53.7)	86 (24.7)	75 (21.6)
Regular Breaks (n=343)	194 (56.6)	138 (40.2)	11 (3.2)
Lunch Breaks (n=347)	235 (67.7)	105 (30.3)	7 (2.0)
Drinking Water (n=342)	277 (81)	36 (10.5)	29 (8.5)
Equipment Needed for Task (n=348)	286 (82.2)	38 (10.9)	24 (6.9)
Handwashing Station (n=344)	298 (86.6)	33 (9.6)	13 (3.8)
Toilet/Porta Potty (n=343)	307 (89.5)	28 (8.2)	8 (2.3)

Comments From Survey Participants:

“One bathroom for about 200 people. Very dirty and not sanitary. The contractor did not clean bathroom and left no toilet paper.”

“Sometimes we don't have a bathroom... I can't wash my hands properly [and] have to use my water bottle...sometimes I don't because I need my water to drink...I bathroom for 60 employees [and] too far away...”

“We should always have a bathroom and water. If I forget mine, it's hard to work... I get thirst and sometimes others don't have enough water to share. We should. Have a medical kit too We don't have one.”

“He laughed when I asked...and said 'if I don't bring my own water I'd probably be dehydrated”

“In the lecheria [dairy] there were only given 3–4-minute breaks and then we're put back to work.”

“The bathrooms are dirty and too far away.”

Safety Training Subjects

Nearly half of the participants did not receive safety training at their workplace in the past year. When asked to rank the top health and safety topics of interest, most participants selected workers' compensation and injury reporting (80.8%) as their top choice. Followed by slips, trips, and falls prevention (69.2%), pesticide safety (59.3%), eye protection (57.8%), and tied in fifth place were heat-related illness (56.3%) and machine safety (56.3%). Nearly 80 percent of participants would prefer their employer, supervisor, field manager, or contractor to provide the safety training. The majority would like to receive training in Spanish (84.7%) and using a video format (74.9%). (See Table 10)

Table 10: Occupational Safety and Health Training Preferences (N=348)

VARIABLES	n (%)
Safety Training at Workplace in Past Year (n=342)	
Yes	182 (55.0)
No	160 (46.8)
Top Training Topics of Interest (n=334)	
Worker's Compensation & Injury Reporting	270 (80.8)
Slips, Trips, & Falls Prevention	231 (69.2)
Pesticide Safety	198 (59.3)
Eye Protection	193 (57.8)
Heat-Related Illness	188 (56.3)
Machine Safety	188 (56.3)
Preferred Person or Group to Provide training (n=348)	
Employer, Supervisor, Field Manager, or Contractor	278 (79.7)
Coworker	97 (27.8)
Promotores de Salud	39 (11.2)
Community Organization	22 (6.3)
Union or Workers Association	6 (1.7)
Other	6 (1.7)
Safety Training in Video Format (n=342)	256 (74.9)
Safety Training Language Preference (n=339)	
Spanish	287 (84.7)
English	34 (10.0)
Trique	8 (2.4)
Mixtec	4 (1.1)
Other	6 (1.8)

“Other” category included Kanjobal, English & Spanish, Mixtec & Spanish

Work-Related Injuries

About 18 percent of survey participants had experienced a work-related injury, and approximately 23 percent of those participants did not report their injury. Of those participants who did report their injury, over 60 percent reported their injury to their supervisor. Nearly 40 percent of participants who had a work-related injury reported they did not receive information about workers' compensation. Most participants who received information about workers' compensation received it in their preferred language (77.8%). (See Table 11)

Table 11: Work Related Injuries and Workers Compensation (N=348)

VARIABLES	n (%)
Experienced an Injury at Work (n=344)	
Yes	62 (18.0)
No	282 (82.0)
Work-related Injury Reported (n=60)	
Yes	46 (76.7)
No	14 (23.3)
Person Injury was Reported (n=46)	198 (59.3)
Supervisor	29 (63.0)
Employer or Contractor	9 (19.6)
Healthcare Professional, Labor & Industries (L&I), or Family Friend	5 (10.9)
Other	3 (6.5)
Received Information About Workers' Compensation (n=46)	
Yes	27 (58.7)
No	19 (41.3)
Workers Compensation in Preferred language (n=27)	
Yes	21 (77.8)
No	6 (22.2)

Social Characteristics

Over half of the participants surveyed rent their own home and approximately one-third live in employer-provided housing (31.9%). Most participants live in an apartment or duplex (35.9%). About 40 percent live less than 10 miles from their worksite, and 34 percent reported having seen pesticides applied on or next to their housing. (Table 12)

Table 12: Housing Characteristics (N=348)

VARIABLES	n (%)
Housing Provider (n=348)	
Own Home	28 (8.0)
Rent, Non-work Related	190 (54.6)
Rent, Government or Charity Sponsored	11 (3.2)
Employer Sponsored (Grower or Labor Contractor)	111 (31.9)
Other, Including Living with Friends or Relatives	8 (2.3)
Housing Type (n=345)	
Single Family Home	88 (25.5)
Apartment or Duplex	124 (35.9)
Barracks or Dormitory	89 (25.8)
Trailer	39 (11.3)
Other, including Hotel	5 (1.5)
Housing Distance from Worksite (n=315)	
Live at Work Location	23 (7.3)
Less than 10 Miles	128 (40.6)
10 to 24 Miles	131 (41.5)
25 or more Miles	33 (10.4)
Observation of Pesticides Applied On or Next to Housing (n=325)	
Yes	111 (34.0)
No	214 (65.6)

Of the participants surveyed, the majority had at least one person under 18 living in the same household. Nearly 60 percent of participants reported having children younger than 12 years old living with them. Of those, participants with children under 12 years living in the same household reported their children staying home with other family members (64.4%), going to a babysitter or daycare (41.9%), and at school during the school year (31.9%) while they are at work. (Table 13)

Table 13: Household Characteristics

Variables	n (%)
Number of Children (under 18) Living in Housing (n=344)	
None	84 (24.4)
1-2	130 (37.8)
3-5	120 (34.9)
6-8	10 (2.9)
Children 12 years or Younger Living in Housing (n=341)	
Yes	199 (58.4)
No	142 (41.6)
Where Children Under 12 Years Old Go While Caregiver is at Work (n=191) *	
Home Alone	20 (10.5)
Home with Family	123 (64.4)
Babysitter or Daycare	80 (41.9)
At School (During School Year)	61 (31.9)
Other	11 (5.6)

*These categories were not mutually exclusive; participants had the option to select multiple options.

Access to Health Care and Community Resources

Farmworkers face barriers that prevent them from accessing health care services and community resources (Table 14). The lack of access to these services includes language barriers (i.e., not speaking Spanish or English), lack of awareness of resources, and proximity to help in the community. For example, about 60 percent of participants had not seen a doctor in the past year. As described in the comments by participants, many of the barriers in accessing healthcare services included lack of access to health insurance, lack of awareness of services, and travel distance.

Table 14: Access to Resources in the Community

Resources Type	Access To Resources [n (%)]		
	Yes	No	Not Available in Community
Park (n=346)	294 (85.0)	44 (12.7)	8 (2.3)
Public Transportation (n=346)	252 (72.9)	80 (23.1)	14 (4.0)
Private Transportation (n=347)	319 (92.0)	27 (7.8)	1 (0.3)
Grocery Stores (n=347)	291 (83.9)	38 (10.9)	18 (5.2)
Health Clinics (n=345)	267 (77.5)	57 (16.5)	21 (6.1)
Community Centers (n=344)	229 (66.7)	86 (24.9)	29 (8.4)
Library (n=344)	238 (69.3)	77 (22.3)	29 (8.4)
Church (n=345)	285 (82.7)	49 (14.2)	11 (3.2)
Adult Education Classes (n=345)	190 (55.2)	123 (35.5)	32 (9.2)
Schools (n=345)	292 (84.7)	46 (13.3)	7 (2.0)
Elected Local/County Representatives (n=342)	166 (48.7)	128 (37.3)	48 (14.0)
Child Care (n=343)	247 (72.1)	59 (17.2)	37 (10.8)
Traditional Foods (n=343)	270 (78.8)	55 (16.0)	18 (5.2)
Community/ Personal Garden (n=342)	197 (57.7)	117 (34.1)	28 (8.2)
Emergency Preparedness Information (n=336)	132 (39.2)	170 (50.4)	34 (10.4)

Phase Two: Farmworker Digital Stories Results

This section presents the themes and subthemes that emerged through a thematic analysis of the participant's digital stories. Illustrative quotes are provided to capture the lived experiences of the participants. Three farmworker digital storytelling workshops were held, and the participants were recruited using the same criteria and from the same population as the piloted community farmworker survey.

Digital Storytelling Workshop Participants

A total of 18 farmworker digital stories were collected. The majority of the digital storytelling workshop participants were female (n=13), and 50 percent of the participants were between the ages of 24 to 44 years old. All the participants reported speaking Spanish. While five participants reported speaking only Spanish, most participants reported speaking Spanish and English (n=9). In addition, four participants reported speaking Mixteco. Demographic characteristics of digital storytelling workshop participants are presented in Table 15.

Table 15: Farmworker Digital Storytelling Participant Demographics

Participant Id	Age (years)			Sex		Hispanic/Latino	Languages Spoken		
	18-24	24-44	45-64	Male	Female		English	Spanish	Mixtec
A1		1			1	1	1	1	
A2		1			1	1	1	1	
A3		1			1	1	1	1	
A4	1			1		1	1	1	
A5	1				1	1	1	1	
A6	1				1	1	1	1	
A7		1			1	1	1	1	
B1			1		1	1		1	
B2			1	1		1		1	1
B3		1			1	1		1	
B4		1		1		1	1	1	
B5		1		1		1		1	1
B6	1			1		1	1	1	1
C1		1			1	1		1	1
C2			1		1	1		1	
C3			1		1	1		1	
C4		1			1	1		1	
C5	1				1	1	1	1	
Totals (n; %)	5 (27.8)	9 (50)	4 (22.2)	5 (27.8)	13 (72.2)	18 (100)	10 (55.6)	18 (100)	4 (22.2)

Table 16 provides a list of the participant's digital story titles, the language of the digital story narration, and their video length. The average video length of the farmworker digital stories was

approximately two minutes and seven seconds long. Half of the participants' digital levels were predominantly English; however, because most of the participants spoke Spanish and English, many of the narrations incorporated words and phrases in both languages. For example, one participant's digital story was narrated in Mixtec and was later translated into Spanish and English. Translation was completed by community member who was a language interpreter with our community partner. Participants chose the titles for their digital stories. These titles shed light on the central theme of participants' individual digital stories and into the lived experiences of farmworkers.

Table 16: Digital Story Characteristics

Pt. ID	Story Title	Digital Story Original Language	Video Length
A1	Echale Ganas <i>Try Hard</i>	English	3:22
A2	Una Vida <i>A Life</i>	English	2:32
A3	Don De Servir <i>The Gift of Serving</i>	English	2:31
A4	El Gran 18 <i>Big 18</i>	English	2:33
A5	Ansiedad <i>Anxiety</i>	English	2:07
A6	La Luna <i>The Moon</i>	English	2:08
A7	La Escuela Secundaria <i>High School</i>	English	1:47
B1	El Sufrimiento Del Sueño Americano <i>The Suffering of the American Dream</i>	Spanish	1:07
B2	El Viaje Que Hice Por Mi Familia <i>The Journey I Made for My Family</i>	Mixtec	2:43
B3	Un Sueño <i>The Dream</i>	Spanish	1:41
B4	El Precio De La Injusticia <i>The Cost of Injustice</i>	Spanish	1:39
B5	La Experiencia Del Aprendizaje <i>The Experience of Learning</i>	Spanish	1:42
B6	Sin Título <i>Untitled</i>	English	3:27
C1	Mujer Sola <i>The Lonely Woman</i>	Spanish	2:13
C2	Mi Sacrificio <i>My Sacrifice</i>	Spanish	1:44
C3	La Vida De Un Imigrante <i>The Life of an Immigrant</i>	Spanish	1:06
C4	La Vida De Un Imigrante No Es Fácil <i>The Life of an Immigrant is Not Easy</i>	Spanish	2:10
C5	Una Meta Por Cumplir <i>A Goal to Achieve</i>	English	1:40

Emerging Themes:

The following section will discuss the major themes and subthemes that emerged from the farmworkers' digital stories. Table 17 lists the key themes found in the digital stories. The codebook with the complete list of the thematic codes and their definitions are provided in the appendices.

Table 17: Thematic Codes

Primary Theme	Secondary Themes
Migration Journey & Immigration	● Precarious Immigration Status ● Psychological and Emotional Effects ● Push & Pull Factors ● Treacherous Journey to Arrive in the U.S.
Workplace Conditions (Social & Physical Conditions)	● Child Labor ● Exposure to Hazardous Conditions ● Exposure to Weather & Environmental Conditions ● Hostile Work Environment ● Physically Demanding Labor ● Precarity of Work ● Prevention and Safety Training
Physical, Psychological and Emotional Effects	● Effects on Family ● Emotional: Feelings of Loss ● Emotional: Feelings of Stress, Frustration, Anger ● Physical Effects: Work-Related Injury & Illness
Community Environment and Psychosocial Factors	● Barriers in Access to Resources ● Community Resources ● Discrimination
Strategies for Survival	● Collective Support: Familial & Community ● Individual Coping ● Perception of self ● Taking Initiative to Change and Seek Justice

Each participant's digital story highlighted various issues and themes, which inform us about the key experiences of farmworkers. Table 18 lists the presence of these themes by participant identification. The remainder of this section will focus on what we can learn about farmworkers' lived experiences from these themes.

Table 18: Presence of Themes By Participant

	Participant by ID																		
Theme	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	
Migration Journey & Immigration																			
Precarious Immigration Status					•					•						•			
Psychological and Emotional Effects					•			•		•				•	•	•			
Push & Pull Factors	•					•		•	•	•					•	•	•		
Treacherous Journey to Arrive in the U.S.			•					•		•	•	•	•	•	•	•	•		
Workplace Conditions (Social & Physical Conditions)																			
Child Labor		•									•							•	
Exposure to Hazardous Conditions		•									•		•	•					
Exposure to Weather & Environmental Conditions		•						•	•					•	•				
Hostile Work Environment										•	•		•	•	•	•	•		
Physically Demanding Labor	•	•				•		•			•		•		•		•	•	
Precarity of Work		•				•			•					•		•	•	•	
Prevention and Safety Training												•		•			•		
Physical, Psychological and Emotional Effects																			
Effects on Family		•				•	•							•			•	•	
Emotional: Feelings of Loss		•			•	•	•						•				•	•	
Emotional: Feelings of Stress, Frustration, Anger	•	•			•		•		•	•	•			•	•	•	•	•	
Physical Effects: Work-Related Injury & Illness											•			•					
Community Environment and Psychosocial Factors																			
Barriers in Access to Resources	•				•		•			•		•	•						
Community Resources			•							•	•		•						
Discrimination							•			•	•	•		•			•		
Strategies for Survival																			
Collective Support: Familial & Community	•		•	•	•	•		•				•			•		•	•	
Individual Coping	•	•	•	•	•		•	•		•	•	•	•	•	•		•	•	
Perception of self	•		•		•		•	•		•			•		•			•	
Taking Initiative to Change and Seek Justice			•		•		•	•	•	•	•	•	•	•	•		•		

Theme: Migration Journey & Immigration

Through the farmworker digital stories, we can learn about the participants' periods of transition and adaptation related to the migration journey from their home country into the U.S. The most common experience shared across participants' stories was the treacherous journey taken to arrive in the U.S. and the reasons that influenced their decision to migrate. In addition, participants shared about the adjustments made to their lives and the effects of these experiences. Immigration is an important issue to learn about to better understand immigrant farmworkers' experiences living in the U.S. I will provide a brief description of the themes that emerged from participants' stories related to immigration.

Participants shared various 'push' and 'pull' factors that influenced their decision to leave their home country and arrive in the U.S. 'Push' factors are the factors or conditions that exist in their home country, while 'pull' factors are the circumstances that exist in the destination country, in this case, the U.S. The primary reasons provided by participants were economic and for the search of opportunities to better their lives. The family was one of the most significant compounding reasons for both 'push' and 'pull' factors. Participants expressed their desires to financially support their families and their hopes for a better future for their children. In addition, a common non-economic reason shared amongst female participants was their desire to be reunited with their spouse or other family members who had already immigrated to the U.S.

One female participant shares her reason for immigrating by saying...

I Came To The United States Because I Experienced Poverty	<i>Me Vine Para Los Estados Unidos Por La Pobreza</i>
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Another participant shared her reason as follows...

I Came From Mexico Looking For A Better Life And To Find My Brother Who Was Lost For 10 Years	<i>Me Vine De México Para Otra Vida Mejor Y Para Buscar A Mi Hermano Que Estaba Perdido Por 10 Años</i>
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While sharing their reasons for immigrating, many participants also shared the psychological and emotional effects of the treacherous journey and their experiences once they arrived in the U.S. Several participants expressed the awareness they had of the potential dangers and risks of the journey to the U.S.; however, the reasons for immigrating were more significant, and therefore, they would face the risks.

One participant shares that one of her reasons for migrating to the U.S. was to prevent her children from having to suffer the journey of crossing the border in the future, despite her husband's hesitation.

An excerpt of her story follows...

I Told My Husband That I Wanted To Go With Him, But He Didn't Want Me To He Came For 7 Years, And I Stayed In Mexico Alone And One Day My Husband Told Me That He Suffered A Lot When He Would Cross The Border I Told Him That I Wanted To Come So That My Children Would Not Suffer Like He Suffered	<i>Yo Le Decía A Mi Esposo Que Me Venía Con Él Pero Él No Quería Él Se Vino Por 7 Años Y Yo Me Quedaba En México Sola Y Un Día Mi Esposo Y Yo Me Dijo Que Él Sufría Mucho Cuando Pasó La Frontera Yo Le Dije Que Me Quería Venir Para Que Mis Hijos No Sufrieran Lo Que Sufría Él</i>
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Participants also shared some of the challenging terrains they faced as they attempted to cross the border.

One participant shares how long her journey was by sharing...

It Took Me 3 Days Of Walking In Day And Night Across The Desert	<i>Dure 3 Días Caminando En El Desierto Día Y Noche</i>
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Another participant shares that despite the treacherous journey, her desires and hopes for the future were greater.

In The Dangerous Desert, Tired Feet From Walking Long Distances To The North The Thirst To Give A New Life Was So Deep.	<i>En El Desierto Peligroso, Pies Cansados Por Caminar Largas Distancias Al Norte La Sed Tan Profunda Para Dar Una Nueva Vida.</i>
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Another commonality shared by some participants was that many faced the treacherous journey at a young age or brought their child with them.

One participant in particular shares...

My Daughter And I Arrived In The Year 2000 I Came To Follow My Husband	<i>Yo Y Mi Hija Llegamos En El 2000 Vine A Seguir A Mi Esposo</i>
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Despite the hopes and desires that fueled participants' motivation to immigrate into the U.S., the reality of the conditions they face as immigrants were very much present in the farmworker stories. Participants expressed the challenges they endured in adjusting to their lives in the U.S. Often describing the difficult decisions and the sacrifices made by many immigrants.

One participant who is a mother shares this experience in her digital story by saying...

When I Came To The United States, My Life Was Not Easy I Had To Leave My 3-Year-Old Daughter In Search Of A Better Future	<i>Cuando Yo Llegué A Los Estados Unidos Mi Vida No Era Fácil Tuve Que Dejar A Mi Hija De 3 Años De Edad Para Un Futuro Mejor</i>
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Another example of a participant's story that depicts the experience faced by many immigrants and farmworkers in the U.S. is a participant forced to leave her country due to political persecution. As a result, she emigrated to another country before arriving in the U.S. She describes the unfortunate reality she faced in the U.S. due to her precarious immigration status.

My School And Work, My Family, My Home, Everything Is There For Personal Reasons And Political Problems That Are Currently Happening My Native Country Of Nicaragua My Family Is Forced To Emigrate To Costa Rica I Have To Support My Brothers Because Of The Persecution In That Way I Am Forced To Come To The United States In Search Of A Better Future And To Support My Family The Reality Is Something Else When I Arrive In The United States The Lack Of One's Rights The Abuse From Those With Power Lack Of Knowledge Labor Exploitation All That One Experiences When Living As Undocumented	<i>Mi Estudio Y Trabajo Mi Familia Mi Hogar Todo Está Ahí Por Motivos Personales O Problemas Políticos Que Están Pasando Actualmente En Mi País Natal Nicaragua Mi Familia Es Forzada A Emigrar A Costa Rica Tengo Que Apoyar A Mis Hermanos Por La Persecución De Esa Forma Me Veo Forzada A Venirme A Estados Unidos En Busca De Un Futuro Mejor Y Apoyar A Mi Familia La Realidad Es Otra Al Llegar A Estados Unidos La Falta De Derecho El Abuso De Los Que Tienen El Poder Falta De Conocimiento Explotación Laboral Que Experimentan Uno Al Vivir De Manera Illegal</i>
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Although participants did not explicitly disclose their immigration status, many of them expressed the circumstances they and many other immigrants face due to the immigrant climate that exists within the U.S. For example, one participant shares her experience with anxiety because of immigration policies enforced in the U.S.

She shares...

2003 ICE Was Formed And I Learned That It Is Possible I May Never See My Parents Because Of Their Status. I Didn't Even Know That Was An Issue Until Classmates Came Back From Missing Days, Due To Their Dad Being Deported Or Taken. I Ask Myself, Why Is This Happening? Happiness Being Taken Away. This Ruined My Peace For The Rest Of My Life	<i>En El 2003 Se Formó ICE Y Aprendí Que Era Posible Que Nunca Vería A Mis Padres Por Su Estado. Ni Siquiera Sabia Que Eso Era Un Problema Hasta Que Regresaron Mis Compañeros De Clase Después De Haber Perdido Días, Debido A Que Su Padre Fue Deportado O Secuestrado. Me pregunto ¿Qué Está Pasando Esto? La Felicidad Se Está Arrebatado. Esto Arruino Mi Paz Por El Resto De Mi Vida</i>
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The farmworkers' stories were expressed chronologically, beginning with their migration journey and the experiences in adjusting to their new lives in the U.S. Many of them made the connection between their immigration experience and the labor conditions they face. Later in this section, we will learn more about how farmworkers adjusted to these conditions.

Theme: Workplace Conditions (Social & Physical Conditions)

One primary focus of this project was to understand the workplace conditions that farmworkers face. The literature informs us of the dangerous working conditions farmworkers across the country face every day. The findings of this project provide the context of these conditions

through the descriptions provided by the farmworkers' testimonies incorporated into their digital stories. As these farmworkers developed their digital stories, many shared the numerous adverse physical and social conditions they've endured in their workplace. This section will provide examples of the key themes that emerged from the farmworker digital stories regarding their workplace's physical and social conditions.

Many farmworkers recalled being exposed to dangerous conditions in their workplace, such as chemicals and pesticides, weather, and other environmental conditions. In addition, the precarious conditions of agricultural work, such as low wages and the seasonality of employment, force workers to have to work longer hours and endure difficult conditions out of necessity to survive. Many farmworkers described how their jobs were physically demanding and the challenging labor conditions they had to experience. These experiences were consistent across the various industries within agriculture. The participants of the farmworker digital stories worked across numerous crops. They performed various labor tasks including the harvest of blueberries and raspberries, dairy, pumpkin harvest, fish processing, potato warehouse, meat packing, and other field crops.

One participant who worked in numerous agricultural industries describes her experiences working in agriculture by sharing...

Later I Was Offered Another Job And I Accepted It Because That Job Was More Stable And Working In The Pumpkins, Potato Warehouses, And The Fisheries Were Seasonal And Temporary I Also Made The Change In Order To Spend More Time With My Family Because During Harvest There Were Times, We Would Start Work At 5 Am And We Wouldn't Be Out Until 11 Pm	<i>Después Me Ofrecieron Otro Trabajo Y Lo Acepté Porque Ese Trabajo Ya Era Fijo Y En Las Calabazas, Paperas, Y Pescaderías Son Temporales También Hice El Cambio Para Poder Estar Más Tiempo Con Mi Familia Porque En Temporadas Había Veces Que Entrábamos A Las 5 De La Mañana Y Salimos Hasta Las 11 De La Noche</i>
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Another participant describes the conditions she experienced while working in agriculture as...

When I Got Here I Worked In The Fields In The Harvest Picking Blackberries And Blueberries I Worked More Than 8 Hours Under The Sun And In The Rain And In The Winter I Would Endure The Cold While Pruning The Blackberry	<i>Al Llegar Aquí Trabajé En El Campo En La Pizca De La Zarzamora Y Arándanos Trabaje Más De 8 Horas Bajo El Sol Y La Lluvia Y En El Invierno Soportar El Frío Podando La Zarzamora</i>
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Another participant shares a similar experience saying...

When I Got Here I Started Working In The Flowers I Had A Terrible Experience At Work Because It Would Rain, It Was Cold, And We Still Had To Work I Would Work During The Season Of The Flowers And Later In The Fruit	<i>Cuando Llegué Aquí Empecé A Trabajar En La Flor Fue Muy Feo Mi Experiencia En El Trabajo Porque Llovía, Hacía Frío, Y Así Trabajábamos Trabajaba En La Temporada En La Flor Y Después En La Fruta</i>
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Another issue that emerged from these stories was the lack of work amenities and protections provided to farmworkers. In addition, participants described the lack of access to safety and health training and, more importantly, training was limited in topics and not provided in their preferred language. For example, safety and health training was often offered in English or Spanish but nearly never in other indigenous languages.

One participant describes her experiences working in agriculture while being pregnant. She describes the limited knowledge and awareness of pesticide exposure and its effects on her health.

And I Did Not Know That The Chemicals Were Harmful... I Still See That This Is Still Happening To Other Women Who Also Have To Work And Be Exposed To Chemicals While Being Pregnant There Are No Trainings On The Risks Of Being Exposed To Chemicals And Pesticides	<i>Y No Sabía Que Los Químicos Hacen Daño... Todavía Veo Que Las Mujeres Les Está Pasando Lo Mismo También Trabajan Embarazadas Con Químicos No Hay Entrenamiento Sobre Los Riesgos De Trabajar Con Químicos Y Pesticida</i>
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Another complexity that exists in agriculture is the circumstances that lead to child labor. Characterizing children's experiences in the agricultural fields can be challenging, and the data on this has been limited. Through participants' stories, some of the farmworkers shared their experiences working in agriculture as a child. In the next section, we will further describe the impacts of child labor on these workers' lives. We can learn from one participant who shares his experience working in agriculture as a child for several years for this section.

From 12 Years Old Until I Was 18 I Worked In The Fields During The Harvest	<i>Desde Los 12 Años Hasta Los 18 Trabajé En El Campo De La Pisca</i>
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The physical conditions farmworkers experience has been described in previous studies and literature. However, we know very little about the social environment of the workplace. One of the common themes across the farmworkers' stories was the social conditions and situations they experienced in their workplace from their peers and often from their employers. These experiences can be characterized as a hostile work environment. These conditions consequently contribute to psychological and emotional effects experienced by farmworkers, which will be discussed later in this chapter. In the following example, we can begin to learn about the compounding social conditions experienced by farmworkers.

One participant recounts his and his coworkers' experiences at a workplace that lacked appropriate amenities and were subjected to work abuse by their employer.

He describes his experience as follows...

They Were Being Mistreated From The Grower Himself And The Working Conditions That They Were Working In Wasn't Really Good Either They Didn't Have Clean Bathrooms Clean Water And Then On Top Of That They Were Being Told That They Were Doing A Really Bad Job	<i>De Que Estaban Siendo Maltratados Por El Mismo Empleador Y Las Condiciones De Trabajo Que Realmente No Era Buenas, No Tenían Baños Limpios Ni Agua Limpia Y Luego, Además De Eso, Les Dijeron Que Estaban Haciendo Un Mal Trabajo</i>
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One of the significant findings of the digital story results was the compounding factors that impact farmworkers' lives. Often farmworkers are vulnerable to workplace conditions, and these have unintended consequences. The compounding experiences of challenging work conditions and negative experiences with their employer seemed to be a commonality across farmworkers' stories. In the following sections, we will learn more about the effects of these conditions on the lives of farmworkers and their families.

Theme: Physical, Psychological and Emotional Effects

As previously mentioned, farmworkers are exposed to various physical and social conditions in their workplace that increase their risk for occupational injuries and illnesses. Through occupational injury and illness data collected, we can quantify the number of farmworker injuries and illnesses. Unfortunately, assessing and evaluating the effect of these impacts on farmworkers and their families can be difficult. This project will help us better understand how farmworkers' lives and well-being are impacted not only by their working conditions but also by the conditions in their communities. The farmworker digital stories give us the information we need to understand the physical, psychological, and emotional effects. This section will discuss the important themes that emerged and will provide examples from participants' digital stories.

Many participants shared the adverse effects their bodies experienced because of their occupation. As previously described, farmworkers are faced with many dangerous physical conditions in the workplace that increase their risk for work-related injury and illness. Participants shared their experiences and the effects of work-related injuries in their digital stories.

One participant explains how, to improve his situation and earn more money by changing tasks at work, he had to suffer various challenging circumstances that would have long-term consequences for him.

Many Years Later I Was Hired Me At A Meat Packing Plant That Job Was Very Hard And Frustrating And Dangerous In This Job I Had A Goal Of Earning \$ 14 An Hour To Meet That Goal I Had To Go Through Bullying, Humiliation, Intense Fatigue, Trauma, Family Problems All Due To This Work One Day While Cutting The Meat A Splintered Bone Jammed My Knife It Pulled A Nerve In My Back And I Fell From The Force That I Did	<i>Muchos Años Después Me Contrataron En Una Empacadora De Carne Ese Trabajo Fue Muy Duro Y Frustrado Y Peligrosa En Este Trabajo Tenía Una Meta De Ganar \$14 La Hora Para Cumplir Esa Meta Tuve Que Pasar Bullying, Humillaciones Cansancio Intenso, Trauma, Problemas Familiares Por Causa Del Trabajo Un Día Cortando Carne Un Hueso Astillado Atoró Mi Cuchillo Me Jaló Un Nervio De La Espalda Me Cae Por La Fuerza Que Hice</i>
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Another participant shares her story of experiencing pesticide illness while being pregnant. She described the moment in her life when she and her coworkers were sprayed with pesticides while working.

I Didn't Know I Was Pregnant Until My Coworkers Had To Go To The Hospital Because The Fields Had Been Sprayed With Pesticides And They Became Ill I Had Nausea And They Told Me I Should Also Go To The Doctor Because Maybe I Had Also Gotten Ill That Is When I Realized That I Was Pregnant And My Pregnancy Was Advanced But I Had To Continue Working Out Of Necessity And I Did Not Know That The	<i>Yo No Sabía Que Estaba Embarazada Hasta Que Un Día Mis Compañeros Fueron Al Hospital Por Los Fieles Que Fueron Fumigados Con Pesticida Y Les Hizo Daño Yo Tenía Náusea Y Me Dijeron Que También Fuera Al Doctor Porque Tal Vez A Mí También Me Hizo Daño Ahí Me Di Cuenta Que Estaba Embarazada Y Ya Estaba Avanzada Pero Seguí Trabajando Por Necesidad Y No Sabía Que Los Químicos Hacen Daño</i>
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Chemicals Were Harmful When My Baby Was Born, She Was Born With A Birth Defect	<i>Pero Cuando Nació Mi Bebé Nació Enferma</i>
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This participant continues her story and reflects on the unintended consequences of not having the awareness or receiving safety and health training on the risks of being exposed to chemicals in the workplace. Unfortunately, the unintended consequences can impact their children's lives as well.

She shares...

There Are No Trainings On The Risks Of Being Exposed To Chemicals And Pesticides It Is Really Terrible Because They Don't Only Affect The Workers They Also Affect Their Families We Carry The Chemicals On Our Clothes And We Bring These Chemicals Home With Us And That's Why Many Children Get Sick	<i>No Hay Entrenamiento Sobre Los Riesgos De Trabajar Con Químicos Y Pesticida Es Muy Feo Porque No Sólo A Los Trabajadores Les Afecta También Les Afecta Sus Familias En La Ropa Llevamos Los Químicos Y Llega Uno A La Casa Con Químicos Y Por Eso Muchos Niños Se Enferman</i>
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One of the common themes across the farmworker digital stories was the emotional effects endured by farmworkers because of their working conditions and the treatment they would receive from their employers. As described in the previous section, the social conditions of the workplace can have effects on workers' well-being. Many farmworkers shared they had worked in agriculture for several years, often with the same employer. However, many of them shared the actions and indifference of their employer made them feel unappreciated and not valued.

One example is of a participant who shares her experience as follows...

I Thought That Because I Had Worked More Than 21 Years In A Job They Would Respect And Value Me There Are Moments When The Chemicals Are Really Strong And Listening To The Supervisor Who Says "I Don't Care" Makes Me Feel That He Does Not Respect Or Values Me	<i>Pensé Que Por Tener Más De 21 Años En Un Trabajo Me Respetarían Y Me Valoraran Hay Momentos Que Los Químicos Están Muy Fuertes Y Escuchar El Supervisor Que Te Dice "I Don't Care" Eso Me Hace Sentir Que No Me Respetan Y No Me Valora</i>
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The social conditions in their workplace and the treatment by their employers often results in farmworkers not reporting or underreporting these harmful conditions. In addition, many participants referenced the fear of retaliation by their employer if they spoke up or reported their conditions.

One participant says...

Due To The Fear Of Being Fired From Our Jobs We Don't Say Anything	<i>Por Miedo Que Nos Corran Del Trabajo No Decimos Nada</i>
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Several participants spoke about how the conditions they had to deal with made them feel depressed, anxious, and angry. These emotions and feelings arose when participants reflected on the impacts on their families. Many participants shared less time to spend with their children and parents because of the long hours they had to work. Participants who were child laborers described feeling like they had lost part of their childhood. One example was provided by one participant who described feeling disappointed that she had to spend her break working long hours in the agricultural fields in the summer when she expected to rest from school. Other participants described the impacts their parents' jobs had on their families.

This participant shares the following...

When I Was Younger, I Saw How My Parent's Work-Life Affected Us At Home Family Dinners Were Not The Same. I Wouldn't Get To See Them During The Week Only On Weekends	<i>Cuando Era Más Joven, Vi Cómo La Vida Laboral De Mis Padres Nos Afectaba En Casa Las Cenas Familiares No Eran Iguales No Podía Verlos Durante La Semana Solo Los Fines De Semana</i>
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Further in her story, this participant also recounts how her mother never complained about the difficulty or challenges she would experience in her workplace.

I Didn't Realize How Much Work It Was Because She Would Never Complain... She'd Remind Me Why Did She Do It "So We Would Never Lack Anything" I Admire My Mom's Sacrifices and Struggle To Get Ahead And Not Depend On Anyone	<i>No Me Di Cuenta De Cuánto Trabajo Era Porque Ella Nunca Se Quejaba... Ella Me Recordaba Por Qué Ella Lo Hacía, "Para Que Nunca Nos Faltara Nada" Admiro A Mi Mamá Por Sus Sacrificios Y Lucha Para Salir Adelante Y No Depender De Nadie</i>
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This was a common example across the participants who were parents. Many of them would endure these conditions in silence and away from their children.

One participant in particular shares...

As A Mother I Do Not Want My Children To Suffer The Things We Have Had To Suffer At Our Work Such As Envy And Discrimination This Work Is Hard On Our Bodies Working In The Heat And In The Mud I Am Proud That My Children Do Not Have To Suffer Like We Have Had To	<i>Yo Como Madre No Quiero Que Mis Hijos Sufran Lo Que Nosotros Hemos Sufrido En Nuestro Trabajo Como La Envidia Y La Discriminación Es Trabajo Pesado Para Nuestros Cuerpos En La Calor Y Entre El Lodo Y Me Siento Orgullosa Que Mis Hijos No Sufran Lo Que Nosotros Sufrimos</i>
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Theme: Community, Environment, and Psychosocial Factors

Although many of the themes that emerged from the farmworker digital stories addressed situations and their impacts on their work experiences, many of the participants also described conditions and causes unrelated to agriculture. These conditions and factors are vital in understanding the cumulative impacts farmworkers experience. The following section will provide examples of the key factors described in participants' digital stories.

One of the key themes that emerged from these participant's stories was experiencing discrimination, harassment, and microaggressions by their peers. In addition, many of the indigenous participants reported feeling discriminated against because of cultural and language differences.

One participant describes being bullied because he did not speak Spanish. He shares the following in his story...

I Was Born In The State Of Oaxaca At The Age Of 5 Years Old, They Took Me To Baja California Where I Experienced What Today They Call Bullying For The Reason Of Not Speaking Spanish Since My Mother's Language Is Mixtec	<i>Yo Nací En El Estado De Oaxaca A La Edad De 5 Años Me Llevaron A Baja California Donde Experimenten Lo Que Hoy Llaman El Bullying Por La Razón De No Hablar El Español Ya Que Mi Lengua Materna Es El Mixteco</i>
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Another participant describes her experience with racism and discrimination in her workplace. She describes her frustration when she realized that her community and peers were perpetuating racism and discrimination. She shares the following...

My First Job Was In The Pumpkins There I Was Scared Because I Would Hear Many Racist Things But Over Time Realized That My Own People Were Racist That Made Me Feel Sad, Angry, And Impotent That People With My Own Race Could Be Like That They Would Not Support Us, They Would Only Support Their Families	<i>Mi Primer Trabajo Fue En Las Calabazas Ahí Me Dio Miedo Porque Escuchaba Muchas Cosas Racistas Pero Con El Tiempo Me Di Cuenta Que El Racismo Lo Hace La Misma Raza Eso Me Daba Mucha Tristeza, Coraje, Impotencia De Que Nuestra Raza Sea Así La Raza De Nosotros No Nos Apoya Solo A Sus Familias</i>
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Several participants described the negative experiences they had with their school system. They recounted the many different microaggressions and racial discrimination by their teachers.

One participant shares the experience that resulted in her not being able to walk in her high school graduation due to the racial tensions experienced in her predominately white school.

I Hated How White Kids Got Treated Differently How Teachers Helped Them More Where Were The Teachers For Me? ... He Never Liked Me I Always Challenged His Classroom Being One Of 2 Latinx In His Classroom Full Of White Students I Was Robbed The Opportunity To Walk With My Class	<i>Odiaba Que Los Estudiantes Blancos Fueran Tratados De Manera Diferentes Cómo Los Maestros Les Ayudaban Más A Ellos ¿Dónde Estaban Los Maestros Para Mí? ... Nunca Le Agrade. Siempre Desafié Su Salón De Clases Siendo Uno De Los 2 Latinx En Su Salón De Clases Lleno De Estudiantes Blancos Me Robaron La Oportunidad De Caminar Con Mi Clase,</i>
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The digital storytelling workshops did not collect information regarding participants' level of formal educational attainment, and participants did not disclose this information in their stories.

On the other hand, one participant describes society's emphasis on education and the potential for those who do not meet these requirements to be undervalued.

We Live In A Society That Wants To Make You Believe That Without A Degree, You Won't Succeed	<i>Vivimos En Una Sociedad Que Quiere Hacerte Creer Que Sin Un Título No Tendrás Éxito</i>
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Theme: Strategies for Survival

Through the farmworker digital stories, we can learn about the many issues and challenges farmworkers face in their workplace and their daily lives and learn about the strategies for survival. This was the most prominent theme across all participants' stories. In addition, farmworkers described the various approaches they use to adapt, cope, and overcome the many challenging circumstances they encounter. In this section, we will present some of the examples shared by farmworkers in their digital stories.

One of the common themes that emerged from participants' stories about survival strategies was the deep-rooted familial connection and support. The family was not only a form of support but, most importantly, a source of strength and motivation in taking the initiative to make changes to their circumstances.

For example, one participant shared that seeing her mother suffering in sadness because of family separation was the '*valor*' [courage] she needed to decide to move to the U.S.

She says...

Watching My Mom Cry Waiting For The Mail For A Letter From Him Gave Me The Courage To Come	<i>Viendo A Mi Mamá Llorar Esperando El Correo De Una Carta De Él Fue Mi Valor De Venirme</i>
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Participants whose parents were farmworkers noted their admiration for their parents' perseverance and strong work ethic. Many of them recounted the sacrifices they would see their parents make for them and their siblings to be ok. Participants described this as a source for them to have the courage to face the adversities they experienced.

One participant's story describes the admiration she feels towards her parents and shares how this has helped her cope during complex and challenging moments.

Echale Ganas! Something My Parents Have Always Made Sure To Ingrain In Me From The Day They Decided To Leave Everything Behind And Come To The U S That's All I've Seen Them Do Day After Day So At Times When I Catch Myself Not Fully Present In My Everyday Being Like While At School And Work Me Acuerdo De Echale Ganas I Remember These Words And Their Sacrifices As I Get Ready For School, My Parents Have Been Awake For Five Hours, Picking Crops Back Home	<i>¡Echale Ganas! Algo Que Mis Padres Siempre Se Han Asegurado De Inculcarme Desde El Día En Que Decidieron Dejar Todo Atrás Y Venir A Los Estado Unidos Eso Es Todo Lo Que Los He Visto Hacer Día Tras Día, Así Que En Los Momentos Que No Me Siento Completamente Presente En Mi Ser Cotidiano Como Cuando Estoy En La Escuela O En El Trabajo Me Acuerdo De Echale Ganas Recuerdo Estas Palabras Y Sus Sacrificios Mientras Me Preparo Para La Escuela, Mis Padres Han Estado Despiertos Durante Cinco Horas, Trabajando</i>
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Many of the participants who were parents described their children as their motivation to withstand all challenges. For others, the emotional sacrifices they faced because of their working conditions, was their motivation to ensure their children would not have to face similar issues. Many participants spoke about feeling pride in seeing their children living a better future than they did.

One participant shares...

I Am Proud That My Children Do Not Have Suffer Like We Did	<i>Y Me Siento Orgullosa Que Mis Hijos No Sufran Lo Que Nosotros Sufrimos</i>
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As described in the sections above, many participants experienced physical and emotional effects caused by their social, political, and occupational conditions and circumstances. Although farmworkers were affected in many ways, these events and circumstances drove them to act and seek improvements and justice for themselves and others.

One participant describes how she realized the working circumstances were unacceptable for her and decided to leave her job.

I Told Myself That That Was Not For Me And That I Had To Look For Something Better And I Decided To Look Another Job	<i>Yo Me Dije Que Eso No Era Para Mí Y Que Tenía Que Buscar Algo Mejor Hasta Que Me Propuse Buscar Otro Trabajo</i>
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Many other participants described how they used their skills, knowledge, and experiences to become a resource for the farmworker community and seek change as a collective.

One of the examples shared amongst participants was the frustration with the lack of access to safety and health training in their preferred language. As a result, many participants shared they became safety and health trainers to support their coworkers.

One participant describes being approached to help develop pesticide training in Mixtec, he describes this moment as follows...

In A Job That I Had, They Took Me To A Training To Know The Dangers Of Pesticides In That Place I Met A Man Who Invited Me To Make An Audio In Mixteco With Other People To Translate The Messages From Spanish To Mixteco Because They Would Go To The Fields Where There Were Workers Who Did Not Speak Spanish, My Desire Is To Continue Learning So I Can Be Able To Help Other People, Especially Those Who Have Gone Through The Same Experiences As Me	<i>En Un Trabajo Que Tuve Me Llevaron A Un Entrenamiento Para Saber Los Peligros De Pesticida En Ese Lugar Conocí A Un Señor Que Me Invitó Hacer Un Audio En Mixteco Con Otras Personas Para Hacer El Mensaje De Español A Mixteco Porque Ellos Iban A Los Campos En Donde Había Gente Que No Hablaba Español Mi Deseo Es Seguir Aprendiendo Para Poder Ayudar A Otras Personas En Especial Aquellas Personas Que Han Pasado Por La Misma Experiencia Que Yo</i>
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Some participants described their response and approach to the hazardous and hostile work environment as an opportunity to organize amongst themselves. Some participants shared the support they received from local organizations in seeking justice in their workplaces.

He describes his experience in supporting his coworkers in a labor strike as follows...

A Few Years Later In The Fall Of 2018 I Was In A Strike With Several Other Farmworkers ... So They All Decide To Have A Strike That Day... I Helped Translate For The Workers Are So That They Could Tell The Grower Himself How They Felt About How They Were Being Mistreated [By] Him... He Asked Me If I Was Interested In Joining The Union Where I Can Support Other Workers That Were Going Through The Same Struggles That We Went Through That Day	<i>Unos Años Después, En El Otoño De 2018 Estaba En Una Huelga Con Varios Otros Trabajadores Agrícolas... Así Que Todos Decidieron Hacer Una Huelga Ese Día... Ayudé A Traducir Para Los Trabajadores Para Que Ellos Podían Decirle Al Empleador Cómo Se Sentían Acerca De Cómo Él Los Estaba Maltratando... Me Preguntó Si Estaba Interesado En Unirme Al Sindicato. Dónde Podía Apoyar A Otros Trabajadores Que Estaban Pasando Por Las Mismas Luchas Por Las Que Pasamos Ese Día</i>
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One of the common themes that emerged from farmworkers' digital stories was supporting each other. Their motivations for supporting each other arose from their lived experiences and situations and the desire to improve their lives.

One participant describes her experience and motivation in helping to support farmworkers as follows...

A Heart Of Service Helping Our Community I Do What I Do Supporting The People Who Work The Land Fortunate Are They Because Their Work Is Dignity	<i>Servicio De Corazón Ayudando A Nuestra Comunidad Hago Lo Que Hago Apoyando A La Gente Que Trabaja La Tierra Dichosos Son Ellos, Porque Su Trabajo Es Dignidad</i>
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Another participant describes how her personal experiences have helped her become an advocate for worker rights.

And Now, Because Of My Experiences, I Have Been Able To Fight And Advocate For The Rights Of Those Who Suffer Abuse In Their Workplace	<i>Ahora También Por Experiencias He Podido Luchar Y Abogar Por Los Derechos De Aquellos Que Sufren Maltrato En Sus Trabajos</i>
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Some farmworker digital story participants shared their hopes and desires for other farmworkers who might have the opportunity to one day listen or view their story. In addition, many of them incorporated a message for farmworkers.

One participant's hope is for other pregnant women to hear her story. The message of hope she shares is...

My Wish Is That Other Women Who Are Pregnant Hear My Story In Some Future They Will Not Have To Work And Be Exposed To Pesticides While They Are Pregnant	<i>Mi Deseo Es Que Otras Mujeres Que Estén Embarazadas Escuchen Mi Historia En Algún Futuro No Tengan Que Trabajar Entre La Pesticida Cuando Estén Embarazadas</i>
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One participant's message to immigrant farmworkers is...

The Message That I Want To Express Is For Every Immigrant We Must Inform Ourselves, We Have Rights, And The Most Important Thing Is To Look For Sources And Organizations That Support Immigrants And To Not Give Up And Beyond That Support Each Other Familias Unidas And Other Organizations That Provide Us Support And Know That We Still Have	<i>Mi Mensaje Que Quiero Plasmar Es Para Todas Las Personas Inmigrantes Que Debemos Informarnos, Que Tenemos Derechos Y Lo Más Importante Es Buscar Fuentes Que Apoyan A Los Inmigrantes Y No Darnos Por Vencidos Mas Allá Apoyarnos Unos A Otros Familias Unidas Y Otras Instituciones Que Nos Brindan Apoyo Y Al Saber De Que Aún Tenemos Esperanza Porque Nuestra Labor</i>
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Hope Because Our Work Is Important	<i>Es Importante</i>
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Visual components

The themes that emerged were primarily derived from the personal narratives created by participants. However, the digital story creation process offered the opportunity for participants to include images and visuals that added layers to their stories. Many Farmworkers chose to include family photos to match the aspects of their stories. To protect participants' identities and preserve their anonymity, we have chosen not to include images that include private, personal, or identifiable information. We have selected a couple of snapshots from participants' videos that can help highlight aspects of their digital stories that can help us better understand the experiences of farmworkers.

As previously mentioned, farmworkers highlighted several different workplace conditions they face. One of the common themes that emerged was exposure to chemicals and pesticides in the workplace (See Image A). Many participants used images of their worksites to portray the environment they worked in, for example, images of the sun when speaking of working in the heat and images of their field site with snow (See Images B to D).

One unique aspect of incorporating visuals in digital stories was the use of color to display emotions. Many participants included photos of the worksites in full color, and others chose to use black and white or grayscale colors (See Images E). With these colors paired with the narrative, the viewer can observe their emotions through the digital story. In addition, many participants utilized transitions between images to juxtapose the various aspects of their lives.

For example, (Image F), we can see the clean kitchen images represent the hope encompassed in the migration to the U.S. in search of a better future. This image is juxtaposed with another photo of the same kitchen dirty/messy, representing the reality of the difficult situations immigrant farmworkers face once they arrive in the U.S.

Image G is another example of a participant who was a child laborer who selected an image of her school cafeteria and worksite. With the use of transitions, this image of her school cafeteria is distorted with the image of the worksite. Other images used by participants were abstract photos to convey various emotions. Some examples are shown in Figure H-I. For instance, Image I includes the image of a rock with graffiti to portray bullying, harassment, and abuse. Finally, many participants used a black screen that lasted the duration of aspects of their stories in some way to hold space for their stories.



Image A: Pesticide Safety Sign at Workplace

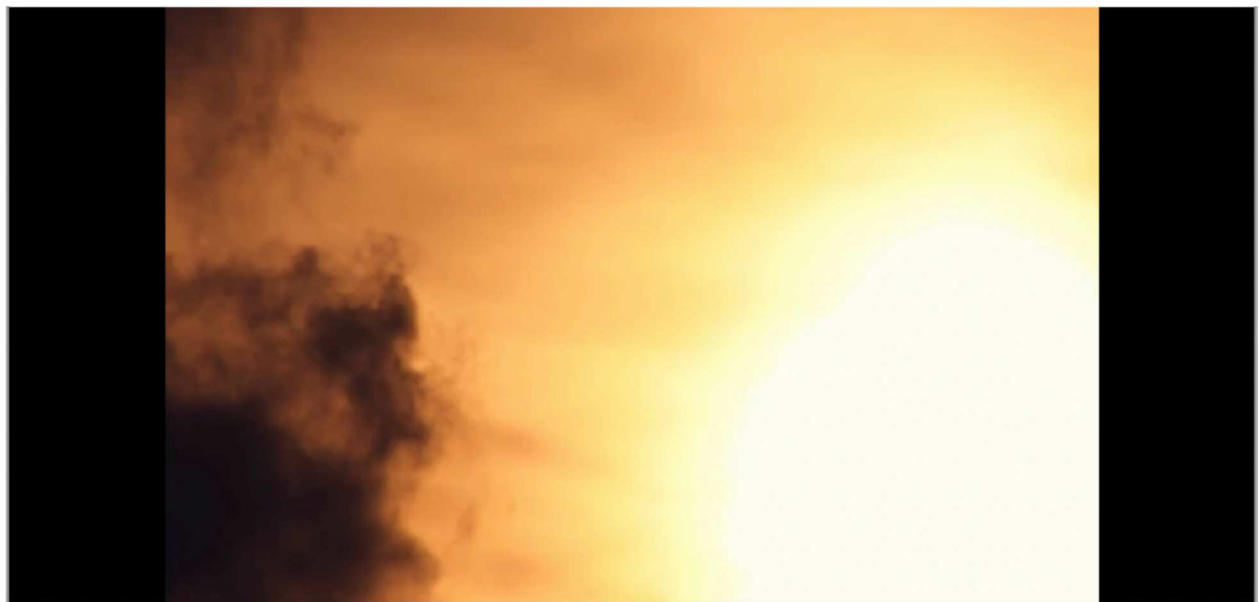


Image B: Exposure to Sun and Heat During the Day



Image C: Worksite Transition into the Heat of the Sun



Image D: Winter Weather Conditions



Images Used in One Participant's Farmworker Digital Story



Image E: Scenery from the Field - Use of Color



Image F: Imagery of Kitchen Juxtaposed With Reality of Being an Immigrant



Image G: High School Cafeteria Being Distorted by the Image of Worksite

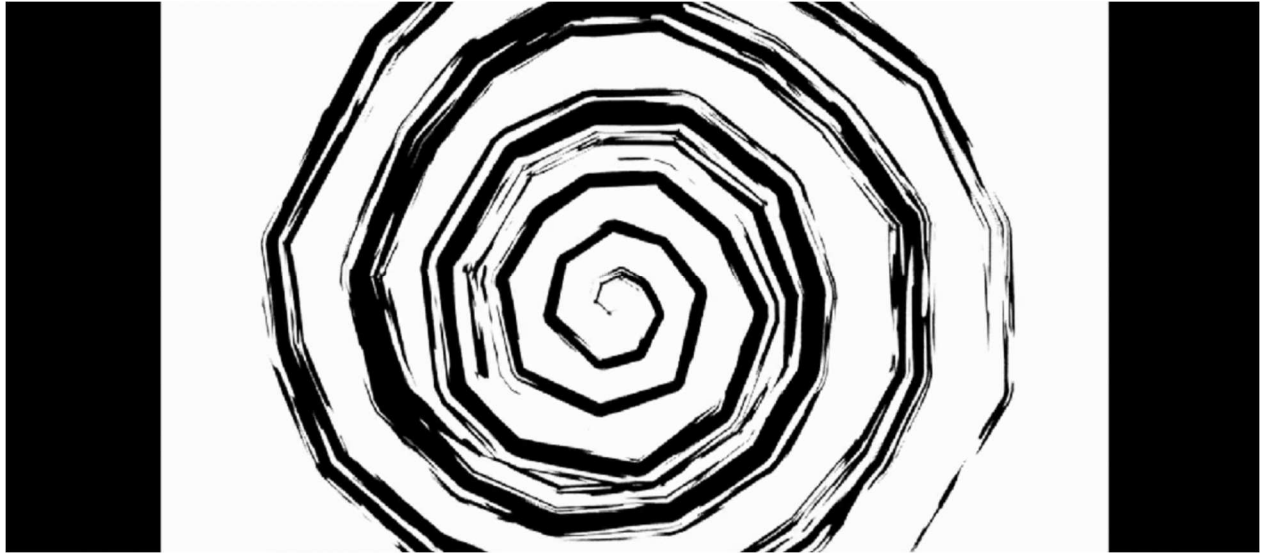


Image H: Image Used to Portray Anxiety



Image I: Image to Reflect on Physical Injury in the Workplace

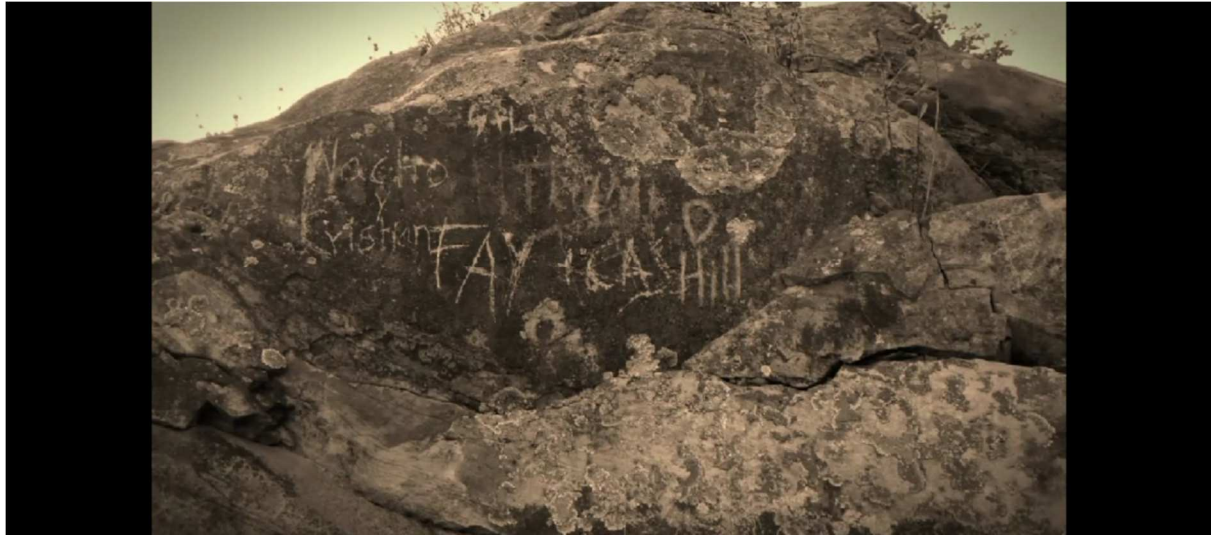


Image J: Rock with Graffiti

Summary

This chapter presented results from the two-phase data collection of this project. First, the community farmworker survey results were summarized using descriptive data and categorized into three categories, including 1) participant demographics, 2) employment and occupational health characteristics, and 3) social and environmental characteristics. Secondly, the results of the farmworker digital storytelling workshops were presented using thematic codes and excerpts from participant digital stories. The results of the community farmworker survey described the demographic, occupational health, social, and environmental factors that influence farmworkers and their community's well-being. The findings from the digital storytelling workshops provided a deeper understanding of farmworkers' lived experiences, including social, cultural, and political sensitivities and their survival strategies.

The next chapter will discuss the results and limitations of this project and will present the implications and recommendations for research and practice.

CHAPTER 5. DISCUSSION: RE-STORYING THE IMPACTS

Discussion of Findings

In our assessment of the U.S. food system and agricultural production, we found that our current food system cannot continue in its current form without permanently harming our environment and farmworkers; therefore, we argue that our current food system is not secure. Food insecurity is a significant issue that is not a mere consequence of enough food produced but also encompasses hidden impacts caused by socioeconomic, political, systemic, and structural barriers.

The U.S. established itself as a global leader in agricultural commodities because of the industrialization of agriculture through breakthrough technologies, intensification of management practices, and the domination of global food market distribution. However, the social-political and economic organization of the concentrated markets favor agrifood corporations over small-holder farmers and non-conventional farming practices, creating a power imbalance hindered by financial constraints. Consequently, this results in business, farm, and crop management trade-off decisions highly influenced by political and economic factors, which have long-term effects on the environment, ecosystem, and farmworkers.

This food system model prioritizes economic gains from higher yield crop production and market distribution, leading to expansion and intensification of agriculture. Unfortunately, the pressure to produce high-quality agricultural commodities often results in the increased use of

fertilizers, pesticides, and herbicides (Lee et al., 2008). Because of this, we continue to observe an excess of agriculture-related contamination in the soil, water, and atmosphere.

Despite the mechanization and biotechnical agricultural advancements, our food system is highly dependent on the labor exploitation of farmworkers. The deep history of exclusion of farmworkers from basic labor rights and protections is rooted in the systemic and racist policies in the U.S.; this is referred to as 'agricultural exceptionalism' (Getz et al., 2008; Guild & Figueroa, 2018; Luna, 1999; Perea, 2011). By excluding these protections, the U.S. and state governments have maintained the vulnerability of farmworkers from accessing health and labor benefits that can help mitigate the cumulative social and environmental impacts resulting from farming practices used to increase yields and ensure the vitality of the food supply chain.

Through the community-academic partnership, this project was able to engage community members and farmworkers directly and was fundamental in completing both data collection phases. Farmworkers have historically been excluded from the conversation and decisions regarding agriculture, food systems, and food security. Therefore, this project needed to engage farmworkers and community members in all stages of the research, including the development of research questions, research design, implementation, data analysis, dissemination of findings, and action. After conducting the first data collection phase, the community farmworker survey, it was evident that the data were still limited and restrictive. Surveys as an assessment method can be effective and efficient in describing issues; however, questions' designs can often be limited due to the predetermined responses and the interpretation of findings. This results in a limited perspective and restricts the development of solutions and interventions. Although many projects

aim to include a mixed approach by integrating qualitative data, often from interviews, those too can be limited and restrictive as they depend on an interview guide with a set of predetermined measures and outcomes. The integration of farmworker digital stories provided the opportunity to assess and gain new insight and contextualize farmworker experiences and learn about their adaptation and survival strategies.

This study described the demographic, occupational, health, social, and environmental characteristics that confirm the continued disproportionate impacts experienced by farmworkers. They have been the most vulnerable and exploited workers in the U.S. They have had to endure low wages, chronic poverty, dangerous working conditions (e.g., pesticide exposure, lack of PPE), and access to health and community resources. Despite efforts to improve workplace conditions, participants reported experiencing unsanitary conditions on the job, including 40 percent not always receiving regular breaks, and 20 percent reported inconsistent access to drinking water. In addition, many participants described their social working conditions as being hostile, given the treatment by their employer, which has detrimental psychological and emotional effects on farmworkers' well-being. In addition, farmworkers are often exploited based on their spoken language, national origin, immigration status, race, and socioeconomic status.

This study was able to further identify the complexities within the farmworker community that can contribute to an individual and community level vulnerability. For example, farmworkers who speak indigenous languages (i.e., Trique, Mixtec, and Coracholan) are more vulnerable and may experience greater inequalities than those who speak Spanish. This is due to the language barriers in access to safety and health information and the cultural and linguistic discrimination

experienced by many indigenous language-speaking participants. These compounding factors present barriers and often impede farmworkers from voicing their concerns in response to unfair labor practices or other working conditions where existing laws should be protecting them.

The economic prosperity, increased crop yields, and the vitality of our food supply chain can all create the appearance of a well-functioning food system and provide a false appearance that our food system is indeed secure. However, because our food system is driven by economics, the impacts on the environment and farmworkers are often considered externalities and are consequently ignored and not prioritized. In addition, consumers and the public are often unaware of the food production systems that ensure the diversity of their food supplies.

Furthermore, their lack of awareness regarding the food system issues is compounded by farmworkers' hidden experiences. Consumers are a central component of the food system, and without the awareness of the impacts of their food consumption decisions, it is more challenging to address food system issues. This leads me to believe that our current food system methods of assessments are not effective in assessing the farmworker and environmental issues.

Limitations

There are various study limitations that must be acknowledged. First, generalizability was not the purpose of this project. Participants were recruited by our community partner who has established relationships with farmworkers in this specific community. In addition, participants were also recruited in public spaces located in the community. As a convenience sample of farmworkers was drawn, we cannot generalize finding to other farmworkers across the U.S. Further, research team members (community surveyors/ Promotorxs) conducted the community

farmworker surveys in-person (face-to-face) in public spaces. Although these surveys were completed in as private location as possible, there is the possibility that the being in public space may have hindered participants responses. Further, because this study relied on self-reported data, responses may be inherently biased. Despite interviewers trained to ask questions in multiple ways to ensure understanding, workers may not have fully understood questions. In addition, participants may have had difficulty recalling specific situations or details.

The research team consisted of Promotorx, trusted community members hired through the community partner, which facilitated the opportunity to engage farmworkers given the established trusted relationship between the community partner and the farmworker community. However, there were limitations in the language capacity of the research team. Although members of the research team were bilingual (English and Spanish), they did not speak indigenous languages, which may have limited the participation of indigenous-speaking farmworkers. A Mixtec language interpreter was contracted for the digital story workshop to help with translation. The farmworker digital stories and participant materials were translated into English, which may have affected the contextual meanings given the differences amongst the languages.

Digital storytelling with the farmworker population is a novel research method. As such, several factors, primarily technical issues, emerged during the digital storytelling workshop facilitation. Participants and the research team had varied technological, digital literacy, and capacity levels, limiting the development process of multimedia integration into participants' digital stories.

Contributions

This dissertation contributes to the ongoing discussion regarding the security and vulnerabilities of the current food system model. However, rather than focusing on addressing global food security through increased production and socio-technical solutions, it challenges our current assessment methods to delve deeper into the consequences of our current production systems on farmworkers and the environment.

Findings from this project supported existing literature in demonstrating the importance of examining and understanding factors that impact farmworkers beyond the individual level and consider the occupational, social, and environmental contexts. Often assessments of farmworkers focus on the workplace conditions; however, this project highlighted new insights into the effects of the social and environmental conditions in their communities. In addition, findings highlighted the ways farmworkers adapt and cope with these impacts. These findings can be beneficial in designing interventions and solutions that build resilience and foster community strengths.

This project developed the digital storytelling process that effectively supported farmworkers' ability to have power and control in the stories they have chosen to share. This is an important aspect given the exclusion of farmworkers from engaging in decisions that impact their lives. In addition, the digital storytelling process allows participants to critically reflect on their personal lived experiences within the socio-political realities. This is critical in building collective critical consciousness on the systems and structures that impact the wellbeing of communities that are often disproportionately impacted. Further, the digitization of farmworker digital stories provided the opportunity for farmworkers to directly share their stories with wider audiences in a

compelling manner. Often research has restrictions and limitations in the ways research findings are disseminated. The digital storytelling methodology allows participants to control how their experiences (data) are shared.

The relevance of this project became more evident given the food system issues were exposed through the COVID-19 pandemic. For the first time in U.S. history, farmworkers were deemed an essential workforce based on their contributions to the security of our food supply and economy (*“Stay Home, Stay Healthy” Order* | Governor Jay Inslee, 2020; Westneat, 2020). Although they were deemed essential, they were provided limited protection, resulting in devastating impacts on the farmworker and agricultural communities. At the beginning of the COVID-19 pandemic, national experts and advocates sounded the alarms in warning that the arrival of COVID-19 in agricultural and rural communities would be more harmful than in urban areas given the existing social and economic disparities (Cosby et al., 2019; Shapiro & Bernton, 2020; Williams et al., 2020). This project, in many ways, has become a 'snapshot' into the pre-COVID-19 social, economic, and occupational conditions affecting farmworkers. These conditions included the lack of access to health care, health and safety information, hazardous work conditions, precarious immigration status, low wages, language barriers, and poor labor-management practices. These pre-existing conditions contributed to the increased vulnerability and susceptibility to the social, economic, and health effects of COVID-19 on farmworker communities. The compounding factors resulted in agricultural communities becoming epicenters of COVID-19 cases, which gained local and national attention (Altan et al., 2020; *COVID-19 Farmworker Study*, n.d.; Shapiro & Bernton, 2020).

Potential implications are yet to be defined, given the community-academic partnership. The future direction of this project will be decided by the community partner and the farmworkers who participated in this study.

Recommendations Future Research

There are many ways to extend this work. For example, the expansion of research with a larger sample size would be beneficial in further characterizing the experiences of farmworkers. In addition, it would be helpful to expand the sample size to be inclusive of indigenous farmworker populations. It would be beneficial to develop research teams to be supportive and inclusive of community members. It would also be beneficial to expand this research to include child farmworker laborers. This project did not collect information on the farm size or farming practices. It would be helpful to analyze the experiences of alternative food systems further and compare farmworkers' experiences who work in different farming structures, including non-conventional farms. Additionally, it would be beneficial to expand on the ways food movements have impacted farmworkers' efforts to organize and improve their working conditions.

Another recommendation for future research would be integrating food and environmental policy analysis, including local, national, and global policies. This project only included policies relevant to the history. It did not examine, for example, workers' compensation policies or programs at the state or federal level.

This project's findings showed that farmworker experiences are not isolated but rather are multifactorial and cumulative. Therefore, addressing the social, economic, and structural barriers farmworkers face requires a multilevel collaboration and equitable inclusion of farmworkers in the research and decision-making process.

Conclusion

Given the historical analysis paired with the current data from this project, it is evident that these issues will continue to exist unless there is a new approach in assessing and addressing the impacts of the food system on farmworkers and the environment. This new approach will require the engagement and direction of farmworkers who have directly been impacted yet ignored by the food system. Their perspectives have been missing and are critical in creating a sustainable, secure, and equitable food system that does not produce unhealthy environments or poses a detrimental risk to workers who are the foundation of the food system.

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APPENDICES

APPENDIX A- ETHICS APPROVAL



UNIVERSITY of WASHINGTON

HUMAN SUBJECTS DIVISION

IRB APPROVAL OF MODIFICATION

November 1, 2019

Dear Vanessa Galaviz:

On 11/1/2019, University of Washington IRB Committee J reviewed the following application:

Type of Review:	Modification/Update
Title of Study:	Addressing Health Disparities Faced by Rural Underserved Agricultural Communities
Investigator:	Vanessa Galaviz
STUDY ID:	STUDY00005168
MOD ID:	MOD00005183
Funding:	Name: *OSP Not Involved, Grant Office ID: NA, Funding Source ID: Galaviz
IND, IDE, or HDE:	None

IRB Approval

Under FWA #00006878, the IRB approved modifications to your research. The expiration of the current IRB approval period remains 7/5/2021.

- Your modification(s) to the research qualified for expedited review ("minimal risk"; Category "minor change").

Location of documents

Use the revised consent forms that were approved by the IRB. They can be downloaded from the Final column under the **Documents tab** in Zipline.

Thank you for your commitment to ethical and responsible research. We wish you great success!

Sincerely,

Theresa Naluai-Cecchini
IRB Administrator, Committee J
206.543.3494
tnaluai@uw.edu
hsdteamj@uw.edu

APPENDIX B- INFORMED CONSENT

Approved
11/1/2019
UW IRB

University of Washington-Department of Environmental and Occupational Health Sciences
CONSENT FORM
Addressing Health Disparities Faced by Rural Underserved Agricultural Communities
Digital Stories

Researchers

Vanessa Galaviz, University of Washington, P: 619-813-4265 E: vanesg@uw.edu
Maria Blancas, University of Washington, P: 206-616-3976 E: mblancas@uw.edu
Rosalinda Guillen, C2C, P: 360-738-0893 E: rosalindag@foodjustice.org

Researchers' statement

We are asking you to be in a research study. This form will give you the information you need to decide whether you want to be in the study. You may ask questions about the purpose of the research, what we would ask you to do, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions, you can decide if you want to be in the study or not. This process is called "informed consent." We will give you a copy of this form for your records.

PURPOSE OF THE STUDY

The purpose of this study is to collect information on how agricultural work and housing conditions affect health. We are going to use this information to develop educational and training materials. These materials will be videos and written stories about actual experiences and lives of agricultural workers.

STUDY PROCEDURES

If you choose to be in this study, we will invite you to participate in a digital story workshop. Digital stories are short "movies" that combine photographs, video, animation, sound, music, text, and often a narrative voice. They are used to raise awareness and share knowledge for others who might share similar situations and experiences. You do not need any special training or skills to create a digital story. We will help you do this. Workshop facilitators will help assist you in the development of a digital story through your personal narrative. Through the storytelling process we will ask you questions related to your agricultural work experience such as work history in agriculture, access to amenities in your workplace, work-related tasks, previous work-related injuries, occupational safety and health training, access to resources, and environmental concerns. These digital stories will be used to help raise awareness on the experience of agricultural workers and train other agricultural workers about safety and health issues. The digital story workshop will take place over three days (approximately 6 hours per day). For completing the whole 3-day workshop, you will be given a maximum of \$230. Payments will be given as gift cards at the end of each workshop day in the following amounts: Day 1: \$50 Day 2: \$80 Day 3: \$100.

You may choose to create a digital story that does not contain any identifying information. There is no need to mention names, locations, employers, families, or any information that might reveal your identity. Your digital story can be completely anonymous. However, because this is your digital story, you may possibly choose to include information that people who watch your digital story can link to your identity. Also, digital stories often have a voice recording of a narrator telling the story. If you choose to use your own voice to narrate your story, people who watch your digital story may recognize your voice and link the story to you. You may ask someone else to be the recorded voice to narrate your story. In your digital story, we can state that the recorded voice is not yours in order to protect your identity. We will also take photographs during the digital story workshop session. We will ask for your permission before taking photographs of you. We will show you photographs, and we will delete them if you do not approve. If you do not grant permission, we will not take any identifying photographs of you.

RISKS, STRESS, OR DISCOMFORT

Your participation is voluntary and can choose to not respond to any questions. We will ask for your name and contact information to ask you questions for the project, arrange days when we will be working with you. You may be concerned that your employers will learn about your answers or other information we collect about you. We will not share any of this information with your employer and it will not interfere with your work.

BENEFITS OF THE STUDY

As an agricultural worker you may gain a better understanding of how you're working and environmental conditions affect your health. Also, this project will create educational and training materials that may help you and other workers receive more information on occupational and safety topics. Although you might not benefit personally from this study, we hope this study will help improve housing and work conditions for agricultural workers.

CONFIDENTIALITY OF RESEARCH INFORMATION

All the information that you provide during the digital story workshop will be confidential and **will not** include your name. All forms will have a unique project ID number that will be assigned specifically to you. Your name and contact information will be kept separate. Government or university staff sometimes review studies such as this one to make sure they are being done safely and legally. If a review takes place your records may be examined, but the reviewers will protect your privacy and the study records will not be used to put you at legal risk of harm. The link between your identifiers and the research data will be destroyed after the records retention period required by state and/or federal law. The information from the study will be summarized in presentations and scientific publications, and all identifying information will be excluded. Data collected from this study may be used in other studies in the future with your permission, but your identifying information will not be shared.

OTHER INFORMATION

Participation in the digital story workshop is completely voluntary. You have the right to not participate. You have the right to stop participating in the digital story workshop at any time without any penalty or loss of benefits to which you are otherwise entitled. To participate in the digital story workshop, you must complete and sign a release form. The release form asks you to indicate the ways you will allow your digital story to be reproduced and shown. For example, you may or may not allow the digital stories to be used in training and educational activities; and, you may or may not allow your digital story to be made available on the internet (i.e. websites or social media). These stories will not be sold for money.

FUNDING

Funding for this study is provided by a pilot research grant from the University of Washington Population Health Initiative and the US Centers for Disease Control and Prevention, and the National Institute of Occupational Safety and Health.

FUTURE STUDIES

We may contact you to invite you to participate in future studies if you have chosen to share your contact information with us for this reason. We will also contact you to invite you to community meetings where project findings will be shared. Your contact information will not be used for any purpose you have not consented to.

Subject's statement

This study has been explained to me. I volunteer to take part in this research. I have had a chance to ask questions. If I have questions later about the research or feel I have been harmed by the study, I can ask one of the researchers listed above. If I have questions about my rights as a research subject, I can call the Human Subjects Division at (206) 543-0098. I will receive a copy of this consent form.

If you agree to everything stated in this form and want to participate in this study, say, "I agree to participate in this research."

If you do not agree to participate, please say so now.

[Copies to: Researcher, Participant]

APPENDIX C- FARMWORKER SURVEY

Confidential

Page 1 of 19

Farmworker Survey

Please complete the survey below.

Thank you!

Demographics

What is your age?

What is your sex?

- ☐ Male
☐ Female
☐ Don't know/Refused

What racial group would you say you belong to?

- ☐ White
☐ Black or African American
☐ Asian
☐ American Indian or Alaska Native
☐ Multi-Racial
☐ Other
☐ Don't know/Refused

Please specify racial group(s):

Are you Hispanic or Latino?

- ☐ Yes
☐ No
☐ Don't know/Refused

Are you indigenous from outside U.S.?

- ☐ Yes
☐ No
☐ Don't know/Refused

Please specify indigenous group:

What is your primary spoken language?

- ☐ English
☐ Spanish
☐ Trique
☐ Mixtex
☐ Coracholan
☐ Other
☐ Don't know/Refused

Please specify language:

How well can you read in Spanish?

- ☐ Very Well
☐ Fairly Well
☐ Not Very Well
☐ Not at All
☐ Don't know/Refused

How well can you write in Spanish?

- ☐ Very Well
☐ Fairly Well
☐ Not Very Well
☐ Not at All
☐ Don't know/Refused

How well can you read in English?

- ☐ Very Well
☐ Fairly Well
☐ Not Very Well
☐ Not at All
☐ Don't know/Refused

How well can you write in English?

- ☐ Very Well
☐ Fairly Well
☐ Not Very Well
☐ Not at All
☐ Don't know/Refused

What level of education did you complete?

- ☐ Part Of Primary School
☐ Completed Primary School
☐ Part Of Middle School
☐ Completed Middle School
☐ Part Of High School
☐ Completed High School
☐ Part Of College Or University
☐ Completed Certificate Program/Associates Degree at College or University
☐ Completed Bachelors Degree or Higher at College or University
☐ I did not go to school
☐ Don't know/Refused

What was your annual gross income in 2017?

- ☐ Did Not Work In 2017
☐ Less Than \$1,000
☐ 1,000 To 2,499
☐ 2,500 To 4,999
☐ 5,000 To 7,499
☐ 7,500 To 9,999
☐ 10,000 To 12,499
☐ 12,500 To 14,999
☐ 15,000 To 17,499
☐ 17,500 To 19,999
☐ 20,000 To 22,499
☐ 22,500 To 24,999
☐ 25,000 To 27,499
☐ 27,500 To 29,999
☐ 30,000 To 32,499
☐ 32,500 To 34,999
☐ 35,000 To 37,499
☐ 37,500 To 39,999
☐ 40,000 To 44,999
☐ 45,000 To 54,999
☐ 55,000 To 59,999
☐ 60,000 Or More
☐ Don't know/Refused

How many adults (18 years or older) contribute to the household income?

How many youth (under 18 years old) contribute to the household income?

Agricultural Work

Do you currently work in agriculture?
(Do you work in the field or work with produce in a warehouse?)

- ☐ Yes
☐ No
☐ Don't know/Refused

When was the last time you worked in agriculture?

- ☐ Less Than 1 Year
☐ 1 To 2 Years
☐ 3 To 5 Years
☐ 6 To 9 Years
☐ 10 Or More Years
☐ Don't Know/Refused

Why did you stop working in agriculture?

Some possible reasons:

Retaliation
Low wages
Injury or illness

How many years have you worked in agriculture in the U.S. ?
(Include this year if they currently work in agriculture.)

- ☐ Less Than 1 Year
☐ 1 To 2 Years
☐ 3 To 5 Years
☐ 6 To 9 Years
☐ 10 Or More Years
☐ I don't do agricultural work
☐ Don't know/Refused

Approximately how many years have you done non-agricultural work in the U.S? (Include this year.)

- ☐ Less Than 1 Year
☐ 1 To 2 Years
☐ 3 To 5 Years
☐ 6 To 9 Years
☐ 10 Or More Years
☐ I only work in agriculture
☐ Don't know/Refused

How much longer do you think you will be an agricultural worker in Washington State?

- ☐ Less Than 6 Months
☐ 6 Months To A Year
☐ 1 or More Years
☐ Don't know/Refused

Where will you be traveling to after you complete your time working in Washington State?

- ☐ Work in another state
☐ Travel back to home country
☐ Will not be traveling or moving
☐ Don't know/Refused

When you work in Washington State do you work for the same employer(s) every year?

- ☐ This is my first time working in WA state
☐ Yes, I always work for the same employer(s)
☐ No, I work for different employers
☐ Don't know/Refused

In the past month, how many farms have you worked on?
(If person does not work in agriculture, enter 0)

In the past month, what crops or industry have you worked with?

- ☐ Berries (strawberry, raspberry, blueberry, other berry)
- ☐ Flowers
- ☐ Greenhouse/Plant nursery
- ☐ Various vegetables
- ☐ Corn or other grains
- ☐ Grapes
- ☐ Hops
- ☐ Tree fruit
- ☐ Potatoes
- ☐ Onions
- ☐ Asparagus
- ☐ Mint
- ☐ Food Processing/ Cannery
- ☐ Dairy
- ☐ Fish/Shellfish
- ☐ Forestry
- ☐ Unemployed
- ☐ Other
- ☐ Don't know/Refused

Please specify industry:

What were your main tasks in berries?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in berries:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid in berries:

What were your main tasks in flowers?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in flowers:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in greenhouses/nurseries?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in greenhouse/nursery:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in vegetables?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in vegetables:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in corn/grains?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in corn/grains:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in grapes?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in grapes:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in hops?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in hops:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in tree fruit?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in tree fruit:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in potatoes?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in potatoes:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in onions?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in onions:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in asparagus?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in asparagus:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in mint?

- ☐ Pick/Harvest
- ☐ Weed
- ☐ Irrigate
- ☐ Plant
- ☐ Prune
- ☐ Thin
- ☐ Graft
- ☐ Handle pesticides
- ☐ Sort or pack indoors
- ☐ Sort or pack outdoors
- ☐ Transport crops (truck driver)
- ☐ Operate farm equipment
- ☐ Transport workers
- ☐ Supervise crew
- ☐ Other
- ☐ Don't know/Refused

Please specify tasks in mint:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

Please specify tasks in food processing/ cannery :

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

Please specify tasks in dairy:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

Please specify tasks in fishing/shellfish:

How were you paid for your work?

- ☐ By the hour
- ☐ Piece rate
- ☐ By the hour plus piece rate
- ☐ Other payment method

Please specify how you were paid:

What were your main tasks in forestry?

- ☐ Tree planting
☐ Thinning
☐ Other
-

Please specify tasks in forestry:

How were you paid for your work?

- ☐ By the hour
☐ Piece rate
☐ By the hour plus piece rate
☐ Other payment method
-

Please specify how you were paid:

In the past week, how many days did you work?

- ☐ I did not work this week
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ Don't know/Refused
-

How many hours do you usually work daily?
(This includes all jobs, both agricultural and non-agricultural.)

Do you have children 12 years old or younger that currently live with you?

- ☐ Yes
☐ No
-

(For Parents of children 12 years old or younger), where do your children 12 years old or younger stay while you are working?

- ☐ They've stayed home alone, at least sometimes
☐ At home with my spouse or with other family
☐ With a neighbor, babysitter, migrant head start, head start, daycare center
☐ With me in the fields
☐ At school during school year
☐ I do not have young children
☐ Other
☐ Don't know/Refused
-

If you indicated "other," please specify.

At your workplace, how often do you have access to the following:

	Always	Sometimes	Never
Shade	☐	☐	☐
Regular breaks	☐	☐	☐
Lunch breaks	☐	☐	☐
Medical attention if you are sick	☐	☐	☐
Toilet/Porta-Potty	☐	☐	☐
Equipment needed for task	☐	☐	☐
Handwashing station	☐	☐	☐
Water for drinking	☐	☐	☐
Personal Protective Equipment (PPE)	☐	☐	☐

Please write any notes on items that participant may have shared that would be important to capture. For example, access to restrooms but not access to gender-specific restrooms or restrooms that are not clean.

Residency

The next question is about where your home is located, we do not need to know your exact address, just a general idea of where you live. This will help us identify the needs of farmworkers and where they live.

What are the names of the area where you live?

(If person does not want to answer, enter "refused")

What is the name of the town/city where you currently live?

- ☐ Lynden
- ☐ Everson
- ☐ Sumas
- ☐ Burlington
- ☐ Ferndale
- ☐ Mt. Vernon
- ☐ Bow
- ☐ La Conner
- ☐ Bellingham
- ☐ Other
- ☐ Not in a town
- ☐ Don't know/Refused

Please specify the town/city closest to where you live:

How many adults 18 years of age and older live in the same place that you live?

(If person does not want to answer, enter "refused")

How many children less than 18 years of age live in the same place that you live?

(If person does not want to answer, enter "refused")

Which of the following best describes the place where you live:

- ☐ Single Family House
- ☐ Apartment (with three or more units)
- ☐ Duplex
- ☐ Barracks/Dormitory/Boarding Home
- ☐ Mobile home or trailer in trailer park
- ☐ Vehicle (including car, RV, camper)
- ☐ Other
- ☐ Don't know/Refused

Please specify housing type:

Who provides your housing?

- ☐ Own home
- ☐ Rented, Non-Work Related
- ☐ Rented, Government Housing
- ☐ Rented, Charity-Sponsored Housing
- ☐ Employer Provided (Grower or Labor Contractor)
- ☐ Stay with Friends/Relatives
- ☐ Other
- ☐ Don't know/Refused

Please specify who provides your housing:

Where is your housing located?

- ☐ Rural, on a farm
- ☐ Rural, near a farm
- ☐ Rural, not near a farm
- ☐ In town
- ☐ Other
- ☐ Don't know/Refused

Please specify housing location:

Have you seen pesticides applied on the property where you live or next to your property?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

How far is your current job from your current housing?

- ☐ I'm Located At The Job
- ☐ Within 9 Miles
- ☐ 10-24 Miles
- ☐ 25-49 Miles
- ☐ 50-74 Miles
- ☐ 75 Miles Or More
- ☐ Don't know/Refused

How do you get to work?

- ☐ Drive Own Car
- ☐ Walk
- ☐ Public Transportation (like public bus)
- ☐ Labor Bus, Truck, Van
- ☐ Ride With Others ("Raitero")
- ☐ Other
- ☐ Don't know/Refused

Please specify how you get to work:

In the place where you currently live, do you have access to the following? (check all that apply)

- ☐ Working Refrigerator
- ☐ Stove/Oven for Cooking
- ☐ Running Water
- ☐ Working Indoor Toilet
- ☐ Bath or Shower
- ☐ Windows that Open
- ☐ Air Conditioning that Works
- ☐ Electric Fan that Works
- ☐ Outside Space (Yard or Porch)
- ☐ Heating Source that Works

Injuries at Work

Have you experienced an injury at work?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

How long ago was your most recent injury?

- ☐ Less Than 1 Year Ago
- ☐ 1 To 2 Years
- ☐ 3 To 5 Years
- ☐ 6 To 9 Years
- ☐ 10 Or More Years
- ☐ Don't know/Refused

Did this injury occur in Washington State?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

Did you report your injury to anyone?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

Who did you report your injury to?

- ☐ Supervisor
- ☐ Healthcare professional
- ☐ Contractor
- ☐ Family or Friend
- ☐ Employer
- ☐ Other
- ☐ Don't know/Refused

Please specify who you reported your injury to:

Why didn't you report your injury?

Did you receive information about filing a report/claim with the Worker's Compensation System?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

Was information available to you in your preferred language?

- ☐ Yes
- ☐ No
- ☐ Don't know/Refused

How long did it take for you to see a doctor?

(Please specify a number and days, weeks, or months.
If they did not see doctor, type "no doctor")

What was the outcome?

Has this injury affected your well-being?

- ☐ Yes
☐ No
☐ Don't know/Refused

Has this injury affected your work opportunities?

- ☐ Yes
☐ No
☐ Don't know/Refused

Please write any notes about other past work injuries. For example, more severe injuries that have happened.

Training

Have you received safety training at your workplace in the past year?

- ☐ Yes
☐ No
☐ Don't know/Refused

Please select the top 5 topics you would like to receive training on:

- ☐ Injury reporting and workers' compensation
☐ Sexual harassment
☐ Heat-related illness
☐ Ladder safety
☐ Slips, trips, and falls prevention
☐ Pesticide safety
☐ Machine safety
☐ Eye protection
☐ Hearing protection
☐ PPE use
☐ Animal handling

Are there topics not listed that you would like to receive training on? (If no other topics, type 0)

Who would you prefer to receive the training from? (Select all that apply.)

- ☐ My employer
☐ My supervisor
☐ Field manager
☐ Coworker
☐ Contractor
☐ My union or workers association
☐ Community organization
☐ Promotora de salud
☐ Other
☐ Don't know/Refused

Please specify other people or groups you would prefer to receive training from:

How would you prefer to receive safety trainings?
(Select all that apply.)

- ☐ Video
- ☐ Audio
- ☐ Classroom (lecture)
- ☐ Informal talks
- ☐ Printed materials (brochure, pamphlets etc.)
- ☐ Other

Please specify formats you would like to get safety training in:

What language would you prefer to receive safety training?

- ☐ English
- ☐ Spanish
- ☐ Other

Please specify your preferred language for safety training:

Environmental Hazards

Select the top 5 environmental issues you are most concerned about:

- ☐ Dust
- ☐ Vehicle exhaust
- ☐ Smoke from burning or wildfires
- ☐ Allergens like pollen and mold
- ☐ Pests like rodents or cockroaches
- ☐ Pesticides
- ☐ Water quality where I live
- ☐ Water quality where I work
- ☐ Garbage or solid waste
- ☐ Human waste or sewage
- ☐ Heatwaves
- ☐ Wildfires
- ☐ Flooding
- ☐ Droughts
- ☐ Storms

Are there any other environmental issues you are concerned about that were not listed?

Do you have any of the following concerns about your housing?

- ☐ House condition
- ☐ Electrical or fire hazards
- ☐ Mold or moisture hazards
- ☐ Other

Please specify concern with your housing:

Do you have any of the following concerns about your neighborhood?

- ☐ Violence, vandalism, and crime
- ☐ Lack of street lighting
- ☐ Lack of sidewalks
- ☐ Lack of crosswalks
- ☐ Dangerous bridges & intersections
- ☐ Other

Please specify neighborhood concern:

If there was an event in your life related to an environmental, home, or neighborhood issue that affected your life and you would like to share, please describe:

Community Resources

In the past 2 years, have you or anyone in your household received benefits or used the services of any of the following social programs?
(Check all that apply)

- ☐ Welfare (general assistance) or TANF (Temporary Assistance for Needy Families)
☐ Food Stamps
☐ Disability Insurance
☐ Social Security
☐ Low Income Housing
☐ Medicaid (Washington Apple Health)
☐ Childcare Program (Head Start, Migrant Head Start)
☐ WIC
☐ Disaster Relief
☐ Legal Advice or Services
☐ Other (specify)

If you indicated "other," please specify.

In the community where you live, do you access any of the following?

	Yes	No	Not available
Parks And Playgrounds	☐	☐	☐
Public Transportation	☐	☐	☐
Private Transportation	☐	☐	☐
Grocery Stores	☐	☐	☐
Health Clinic	☐	☐	☐
Community Centers	☐	☐	☐
Library	☐	☐	☐
Church	☐	☐	☐
Adult Education Classes	☐	☐	☐
Schools	☐	☐	☐
Elected Representatives (Local/County)	☐	☐	☐
Child Care	☐	☐	☐
Traditional Foods	☐	☐	☐
Community or Personal Garden	☐	☐	☐
Emergency Preparedness Information	☐	☐	☐

Are there any barriers that prevent you from using the community resources listed? Please describe.

Healthcare Services

Where do you normally go for health care in this area? (Select all that apply.)

- ☐ Community Clinic/ Migrant Health Clinic
☐ Private Doctor
☐ Urgent Care Center
☐ Health Department
☐ Hospital/ Emergency Department
☐ Healer (Curandero/a)
☐ I don't have a place where I go regularly go for health care
☐ I don't know where to go for health care
☐ Other

Please specify where you go for health care:

Have you been to a doctor in the last year (12 months)?

- ☐ Yes
☐ No

What was the reason you visited the doctor? (Select all that apply)

- ☐ Routine check-up
☐ Immunizations
☐ Pregnancy
☐ Illness
☐ Non-work-related accident
☐ Work-related illness or injury
☐ Chronic Health Problem
☐ Mental Health Care
☐ Took child for health care
☐ Other (specify)

If you indicated "other," please specify.

Would it be helpful to you to have information available about any of the following health care issues?

- ☐ Dental Health
☐ Infant/ Child Health
☐ Immunizations
☐ Maternal health/ pregnancy
☐ Mental health (anxiety, depression, asuntos de salud mental)
☐ Domestic Violence
☐ Substance abuse (alcohol, tobacco, or drugs)
☐ Cancer
☐ Chronic illness
☐ Nutrition
☐ Health insurance eligibility
☐ Other (specify)

If you indicated "other", please specify.

Thank you for completing the survey. We will summarize the results of all the surveys and will provide results back to the community in the future.

Would you be interested in participating in a housing assessment?
(Explain housing assessment to participant.)

☐ Yes
☐ No

Would you be interested in sharing your contact with us to be invited to...

☐ Community meetings where results will be shared
☐ Share your story further
☐ Future research projects

Your contact information will be protected and will only be used for the options you have selected.

Name:

Phone number:

Alternate phone number:

Please provide the best time of day to call and schedule the housing visit.

Field notes:

APPENDIX D- PARTICIPANT DIGITAL RELEASE

Addressing Health Disparities Faced by Rural Underserved Agricultural Communities

Digital Stories: Participant Digital Story Release Form

I, _____ (please print your name), hereby authorize Community to Community Development and the University of Washington- Addressing Health Disparities Faced by Rural Underserved Agricultural Communities Project and their representatives and employees, to use all or part of my final digital storytelling project for the following educational and outreach purposes. *(Please write your initials next to each option that you agree to).*

I understand that by initialing and signing this form, I voluntarily and knowingly agree and consent to screening my digital story, distributing my written script, or displaying images from the story in the following ways:

_____ At future digital storytelling workshops or courses, as an example of script work/design approach. Note any comments or exceptions here:

_____ At conferences or other research events, to generate discussion about the potential of this work as a research method. Note any comments or exceptions here:

_____ In training and educational activities conducted by Community to Community Development or The University of Washington

_____ Posting to an open website, available to the general public.

_____ My written script can be quoted in academic papers or conference presentations, with the understanding that my identity will not be revealed in any such projects.

I have read and understood the provisions of this agreement, and understand that I am entering a voluntary agreement.

SIGNATURE: _____ DATE: _____

PRINT NAME: _____

APPENDIX E- CODEBOOK

Code Type	Title	Description
Primary	Community Environment and Psychosocial Factors	Examples of community and psychosocial factors in the community including the access and lack of access to community resources and environmental conditions.
Secondary	Barriers in Access to Resources	Examples of barriers that prevent or result in the lack of access to resources.
Secondary	Community Resources	Examples of existing community resources, organizations, and support systems.
Secondary	Discrimination	Examples of the discrimination by peers and employers, experienced by farmworkers including bullying, harassment, and microaggressions. Will also include references to fear of retaliation from employer.
Primary	Migration Journey & Immigration	Participants reference to immigration and their lived experiences of their migration journey (i.e., transnational migration or within county(s).
Secondary	Precarious Immigration Status	Reference to the factors or circumstances that result due to an individual's precarious immigration status
Secondary	Psychological and Emotional Effects	Examples of the psychological and emotional effects that result from migration journey or immigration status including emotional trauma and loss of familial connection.
Secondary	Push & Pull Factors	Factors or conditions that influence an individual's migration. ("Push" factors or conditions in home country "Pull" factors or circumstances in the destination country. (Socio-economic, political, life events)
Secondary	Treacherous Journey to Arrive in the U.S.	Reference to an individual's treacherous experience in the migration journey to the U.S.
Primary	Physical, Psychological and Emotional Effects	Examples of the physical and emotional effects experienced by farmworkers because of the conditions in their work and community.
Secondary	Effects on Family	Reference to the effects on family and household; including reference to loss of family time, gendered double shifts (i.e., mothers' role), and lack of childcare access.
Secondary	Emotional: Feelings of Loss	Reference to the emotional effects regarding feelings of sense of loss (i.e., innocence, childhood), grief, and despair.
Secondary	Emotional: Feelings of Stress, Frustration, Anger	Reference to the emotional effects regarding feelings of stress, frustration, and anger.
Secondary	Physical Effects: Work-Related Injury & Illness	Examples of injuries and illness experienced by farmworkers that are work-related includes pesticide illness, heat-related illness (heat irritation, sunburn), and physical injuries.

Primary	Strategies for Survival	Examples of the different strategies used by farmworkers to survive, cope, and heal.
Secondary	Collective Support: Familial & Community	Reference to how familial connection and community are both support and resources.
Secondary	Individual Coping	Examples of how an individual copes through the enjoyment of simple moments, memories, joy, and hopes for the future (i.e., educational goals).
Secondary	Perception of self	Reference to the perceptions individuals have of themselves including being proud of hard work.
Secondary	Taking Initiative to Change and Seek Justice	Examples of how individuals use their skills and knowledge to become a resources and support community (i.e., language interpretations and trainer) and demonstrations of resistance (i.e., worker strike).
Primary	Workplace Conditions (Social & Physical Conditions)	Examples of the agricultural workplace conditions and factors (i.e., social, and physical).
Secondary	Child Labor	Reference to child labor in agriculture.
Secondary	Exposure to Hazardous Conditions	Examples of exposure to hazardous conditions such as chemicals and pesticides. Also includes lack of access to Personal Protective Equipment (PPE).
Secondary	Exposure to Weather & Environmental Conditions	Examples of exposures to weather and environmental conditions such as rain, heat, cold, snow, and smoke.
Secondary	Hostile Work Environment	Examples of situations and conditions in the social environment of the workplace that is unwelcoming and hostile.
Secondary	Physically Demanding Labor	Examples of how physically demanding agricultural work is.
Secondary	Precarity of Work	Examples of conditions regarding the precarity of agricultural work (i.e., seasonality, temporary, low wages etc.).
Secondary	Prevention and Safety Training	Examples of the type of prevention and safety training and lack of access to training including the limited training topic, and the lack of language inclusivity.
Primary	Visual Themes	This code is to keep track of themes that emerge from multimedia (i.e., digital story, photos, storyboard).
Secondary	Use of Imagery	This code is to keep track of the use of imagery to depict emotion (i.e., verbal or visual).
Secondary	Visual Changes to Image	This code is to keep track of visual changes used in digital story (i.e., black and white etc.).