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**Cultivating Resilience:
The Contribution of Community Gardens during COVID-19 in Pomona, California**

by

Juanita Preciado

Claremont Graduate University

2021

APPROVAL OF THE DISSERTATION COMMITTEE

This dissertation has been duly read, reviewed, and critiqued by the Committee listed below, which hereby approves the manuscript of Juanita Preciado as fulfilling the scope and quality requirements for meriting the degree of Doctor of Public Health.

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Cultivating Resilience:

The Contribution of Community Gardens during COVID-19 in Pomona, California

By

Juanita Preciado, DrPH, MPH

Claremont Graduate University, 2021

This exploratory comparative mixed method case study provides an empirical contribution to our understanding of the different functions and meaning of community gardens to social-ecological resilience during the COVID-19 pandemic. In the Spring of 2021, I conducted mixed method case studies on informal and formal community gardens in Pomona, California. Qualitative methods included open-ended questions relating to their experiences of community gardening during COVID-19. Quantitative methods included a survey that included demographic questions and questions that assessed loneliness to better understand the social connections embedded in the gardens. A total of 20 community garden participants and managers were interviewed.

Three key findings emerged: 1) garden site characteristics, specifically growing food, may be a key contributor to differences in loneliness scores between formal and informal gardens; 2) the civic ecology practices observed in the community gardens in Pomona suggest that these informal and formal community gardens support sources of social-ecological resilience from the individual to community level; and 3) this study indicates the capacity for community gardens to provide a model for green infrastructure that fosters social-ecological resilience in the city. Considered together, these findings shed light on how the potential needs of some vulnerable groups, such as low-income individuals, could be addressed in the future of public green spaces, designs, and practices.

DEDICATION

I dedicate this work to four special individuals. To my parents, Alberto and Juanita Preciado whose support knows no bounds and who taught me the value of hard work. Thank you for cultivating a deep love of nature and learning in me. To my husband Eduardo, I appreciate your unwavering belief in me. Thank you for your understanding throughout this process and all the sacrifices you have endured for me to follow my dream. I hope to repay them to you with many opportunities for joy in our future. Lastly, to my dear Amorelle seasons will pass and some day you will be old enough to read this. When you do, know that your presence in my life provided me with the inspiration to accomplish my goals.

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This doctoral process has been a long road with many highs and lows. I could not have managed it without the moments of laughter, kindness, and encouragement I received from my friends. Especially, my dear friend Lucie who throughout the years has been a pillar of support in this educational journey and just life in general. Thank you for being a great friend.

Of course, I have to thank my large family. I appreciate your faith in me and your support in all that I do. As the last of ten children, I firmly believe it was my inability to win an argument against any of my siblings as a child that taught me to never give up. Thank you for instilling that perseverance in me and a sense of humor. Both those things definitely got me through the hard days.

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ABBREVIATIONS

EJ	Environmental Justice
IGS	Informal Green Space
FGS	Formal Green Space
SER	Social-Ecological Resilience
WHO	World Health Organization

DEFINITION OF TERMS

Civic ecology practices. Self-organized and managed stewardship initiatives that reflect a local place and are deemed as opportunities of learning through working in nature (Chan, 2014; Kransy and Tidball, 2012).

Community gardens. A cooperative wherein community members contribute--can vary in what they grow depending on local need (Chan, 2014; Ferris, Norman, and Sempik, 2001; Advocates for Public Spaces & HealthBridge, 2019).

Environmental gentrification. The displacement of lower-income or other vulnerable populations because the transformation of empty lots into greenspace, new greenspace development, or redevelopment of existing greenspaces increases property values due to the location becoming more attractive and desirable for investors and/or residents (Rupprecht & Byrne, 2017).

Formal green space. Land that has been earmarked by city officials for parks, open space, recreation, or urban agriculture.

Formal garden site. A community garden that is located on land that has been earmarked by as parks, open space, recreation, or urban agriculture.

Informal garden site. A community garden that is located on land that has not been intentionally designed or earmarked for parks, open space, recreation, or community agriculture although the land serves that purpose for community members (Wolch et al., 2014).

Informal green space (IGS). Land that has not been intentionally designed or earmarked by city officials for parks, open space, recreation, or community agriculture although they serve that purpose for community members (Wolch et al., 2014).

Resilience. “The perseverance of systems and their ability to absorb change and disturbance and still maintain the same relationships between populations and variables.” (Holling, 1973 p. 14).

Social-ecological resilience. The capacity of a complex adaptive system (e.g., formal green space, or informal open space) to respond or adapt to systemic shocks or disturbances and still maintain its essential functions and identity (Chan, 2014; Folke et al., 2006; Holling, 1973).

Social-ecological system. A complex adaptive system in which humans and nature are interconnected (Berry, 2012).

System. An interconnected set of components that is rationally organized for a purpose (Meadows, 2008). Therefore, a system must contain three key things: elements, connections, and a purpose (Meadows, 2008).

Urban green space. Land that is at least partly covered with grass, trees, shrubs, or other vegetation; this includes parks, community gardens, cemeteries, vacant lots, public plazas, playgrounds, and schoolgrounds (EPA, 2020).

CHAPTER ONE: BACKGROUND

1.1 Overview

This exploratory multi-case study provides an empirical contribution to our understanding of the different functions and meaning of community gardens to social-ecological resilience (SER) during the COVID-19 pandemic. Unlike other social-ecological applications, this study focuses on the social sphere, assessing loneliness as a means to better understand the social connections embedded in systems. Chapter One discusses the study's questions, aims, and significance.

1.2 Project Purpose, Study Questions, and Aims

The purpose of this study is to explore how green space in the form of community gardens contributes to SER during the COVID-19 pandemic using an adapted version of Krasny and Tidball's (2012) Conceptual Model for Civic Ecology. This study focuses on the social sphere of the model and incorporated a loneliness assessment to shed light on the social experiences of community garden users during the pandemic.

The findings of this study contribute to a growing body of research about the contribution of community gardens to SER during a public health crisis. In addition, they provide a platform for community garden users to advance the development of informal green spaces throughout the city. The intent is to provide the results of this study to city stakeholders to advocate for community gardens as a civic priority in the City of Pomona, California to advance equitable access to green space. Understanding that scientists and public health professionals alone cannot improve access to urban green space (Krasny and Tidball, 2012), this research draws from knowledge of local community garden managers and users challenged by the need to mitigate and adapt to the disruptions posed by COVID-19 (Krasny and Tidball, 2012).

The research questions to achieve this goal were:

(1)“How do community gardens in Pomona contribute to social-ecological resilience during COVID-19?”

(2)“To what extent are community garden users experiencing loneliness during COVID-19?”.

The term “social-ecological resilience” in the first question refers to the contextual outcomes outlined by Krasny and Tidball’s (2012) Conceptual Model for Civic Ecology. The model provides a structure that identifies the origins, processes, and outcomes of resilience using civic ecology applications.

To answer the research questions, information on community gardens and their users was a necessary foundation. With this knowledge, a specific plan to explore their contribution was developed. The aims of the study were to:

- 1) assess perceived loneliness of community garden users;
- 2) capture the experiences of community garden users during COVID-19; and
- 3) gain insight into the garden site characteristics that differentiate informal community garden sites and formal community garden sites

Collectively, the aims informed the study’s foundation and design. The study’s findings will establish an understanding of the function and roles of community gardens during COVID-19 and inform how best to support them as a civic priority to advance equitable access to green space in Pomona, California.

1.3 Introduction

Currently 55% of the world’s population live in cities, and in the United States it is over 80% (Berry, 2012; Chan, 2014; UNDESA, 2018). The COVID-19 pandemic has demonstrated

that rapid urbanization impacts the spread of emerging infectious diseases (Neiderud, 2015). Human encroachment into natural habitats and climate change may increase the occurrence of future pandemics; consequently, improvements in public health crisis preparedness, response, and adaptation processes in urban environments are needed (Sharifi & Khavarian-Garmsir, 2020; Connolly et al., 2020). In this regard, the COVID-19 crisis presents an opportunity for planners, public health professionals, and policy makers to learn how to take transformative actions towards creating cities that are more resilient, just, and sustainable (Sharifi & Khavarian-Garmsir, 2020). More recently, attention has been given to the essential role that urban green spaces play in the resilience of cities (The Trust for Public Land, 2020).

The COVID-19 crisis has intensified public health concerns including increased mental health problems due to loneliness. Prior to COVID-19 the high prevalence of loneliness was already described as a “behavioral epidemic” (Jeste et al., 2020). The COVID-19 pandemic has exacerbated the problem of loneliness with the implementation of unprecedented social distancing strategies essential to curbing the spread of the virus (Hwang et al., 2020). By definition, shelter-in-place guidelines have isolated people in their homes, and the impacts of this isolation might be greater for people who have difficulties navigating virtual internet-based social interaction (Kotwal, et al., 2020).

Research suggests that there is a diversity of experiences of loneliness (Horigian et al., 2021). Many older adults have experienced new or worsened feelings of loneliness due to the disruption the pandemic imposed on in-person activities (Kotwal, et al., 2020). According to a report led by health insurer Cigna, more than three in five Americans are lonely. Additionally, the University of Harvard School of Education released preliminary findings that an alarming 61% of young people aged 18-25 reported miserable degrees of loneliness (Weissbourd, et al.,

2021). Experts are justifiably concerned as loneliness has been associated with the risk of premature death from all causes, a risk that rivals those of smoking, obesity, and physical inactivity (CDC, 2021; NASEM, 2020).

Historically, in times of crisis societies have turned to green spaces as beacons of social-ecological resilience (Chan, 2014). Literature has examined the role of green space in general community resilience (Chan, 2014; Okvat and Zaurtra, 2011), urban food disruptions (Barthel and Isendahl, 2013; Barthel et al., 2013), natural disasters (Chan, 2014; Okvat and Zautra, 2011), and armed conflicts (Lawson, 2005). As testing as those conditions were, access to green space contributed to the resiliency of urban dwellers and bolstered morale (Barthel et al., 2013).

The COVID-19 crisis has once again demonstrated the necessity of urban green spaces (The Trust for Public Land, 2020). A recent study published in the *International Journal of Epidemiology* (Astell-Burt et al., 2021) suggested that a 10% increase in urban greening within 1 mile (1.6 km) of study participants' homes is associated with a lower cumulative incidence of loneliness (Astell-Burt et al., 2021). Yet, rapid urbanization and the relationship between humans and their natural environment has dramatically changed the urban landscape of the 21st century (Grove, 2009). Contemporary urban dwellers are now faced with the reality of city landscapes with limited access to public green space and the repurposing of once surrounding agricultural areas (Barthel et al. 2013).

Though not all cities are devoid of urban green space, studies emerging from the field of environmental justice (EJ) have found that the distribution of urban green space often disproportionately benefits predominantly white and wealthier communities (Wolch et al., 2014). Therefore, access to green space is increasingly being recognized as an EJ issue (Wolch et al., 2014). Importantly, concerns extend to the field of public health because ecosystem degradation

aligns with social disadvantage to produce conditions that widen health disparities (Jennings et al., 2016; Myers et al., 2013).

A report, from the Hispanic Access Foundation, stressed that, while Latinos are disproportionately suffering from COVID-19, they are also not receiving the health and resilience benefits of nature (Rowland-Shea, Doshi, Edberg & Fanger, 2020). Inequities in green space access are especially problematic during COVID-19 because it limits options to adapt to the disruptions posed by the pandemic and affects already disproportionately vulnerable populations (Slater et al. 2020). For example, in California Latina/os account for 60% of the COVID-19 cases though they only represent about 40% of the population (California Department of Public Health, 2020).

Among the hardest hit cities in Los Angeles County is the City of Pomona, with 24,778 confirmed COVID-19 cases to date¹ (Los Angeles County Public Health Department, 2021). Once described as an “urban garden” in the 1800s, Pomona now has a population of 151,691 people (U.S. Census, 2019) with 1.49 acres of green space per every 1,000 residents--significantly less than the Los Angeles County average of 8.10 acres per every 1,000 residents (County of Los Angeles Public Health Department, 2018), and less than the minimum 6 acres per every 1,000 residents recommended by national guidelines (National Health Foundation, 2021).

Although addressing inequities in green space access received local attention before the pandemic (Parks and Public Health LAC, 2016), there are significant challenges researchers face when trying to analyze green-space access. Namely, there is no consensus among scholars as to how to measure green-space access or how to define it (Wolch et al., 2014). Given the limited amount of formal green space available in the City of Pomona and the complex challenges

¹ COVID-19 confirmed positive cases as of July 18, 2021 (Los Angeles County Public Health Department, 2020).

researchers face in analyzing green-space access, preliminary research was needed to inform my dissertation. I conducted an environmental assessment in September of 2019 (APPENDIX A).

Both Geographic Information Systems (GIS) and observational data were collected. The environmental assessment was focused on exploring formal green space utilization and geocoding informal green spaces.

For the informal green space, the aim was to document the existence of actively utilized informal green spaces in the community. Informal green spaces were identified with the help of a collective impact group in the City of Pomona entitled Pomona's Promise². Due to the transitional nature a major limitation from this assessment is the possibility that not all informal green spaces in the city were captured. Nonetheless, the data captured is relevant because it provides information about the type of informal green spaces that have emerged in the city and the needs they address.

Based on the findings of the assessment, 80% of the actively used informal green spaces identified were community gardens (n=8); the others were used as hiking areas. The findings from the environmental assessment are consistent with trends in the literature that informal green spaces are most commonly found in cities where residents have less access to formal green space (Chan, 2014) and provide an ideal location for urban agriculture (Advocates for Public Spaces & HealthBridge, 2019). The identification of the gardens allowed for a deeper understanding of the green-space landscape in the city. This study builds upon that knowledge to examine the contribution of these garden sites to social-ecological resilience during the pandemic.

² Pomona's Promise is a collective impact group comprised of individuals and organizations from various youth and family serving entities, including education, government, faith based and, non-profit agencies along with Pomona residents. The group meets to work towards a common agenda of building safe neighborhoods, strong families, and a healthy quality of life in the City of Pomona.

1.4 Assumptions

This study is centered within the transformative research paradigm (Creswell and Poth, 2018). Creswell and Poth (2018) argued that the transformative paradigm provides a framework that advocates action to help individuals by addressing issues of social justice (Mertens, 2007). The basic principle of this transformative framework is that knowledge is not neutral and mirrors the power and social relationships within a society (Creswell & Poth, 2018; Mertens, 2003). Therefore, the purpose of the construction of knowledge is to advance and improve society (Mertens, 2003). Studies using the transformative research paradigm often begin with a stance on an important issue (Creswell & Poth, 2018). In this case, the stance is the need to increase access to urban green space for the Pomona community as an EJ issue.

The ontological assumption of the transformative paradigm recognizes that individuals who are disenfranchised based on their race/ethnicity or any other characteristic can also be excluded from research (Hodgkin, 2008; Mertens, 2007). The transformative paradigm, also described as participatory action research, is collaborative in nature since it is completed in partnership with the research participants rather than “onto” research participants (Creswell & Poth, 2018).

1.5 Limitations

This multi-case exploratory study provides an empirical contribution to understanding the different functions and meanings of community gardens to social-ecological resilience during COVID-19. Because the study is exploratory, uses qualitative methods, and focuses on a range of unique experiences specific to residents of the City of Pomona, its findings are not generalizable. (Chan, 2014).

1.6 Delimitations

The purpose of this study is to explore how informal open spaces in the form of community gardens contribute to social-ecological resilience during COVID-19. Although other forms of informal open spaces were identified (e.g., walking and hiking trails), informal open spaces in the form of community gardens were selected as the focus for the study as they comprised 80% (n=8) of all actively utilized informal green spaces found. Additionally, unlike formal green spaces, informal green spaces had greater autonomy with regards to remaining open during the COVID-19 shelter-at-home orders.

1.7 Conclusion

The findings of this study will be presented to City of Pomona stakeholders in an effort to address complex challenges with regards to green space access in Pomona, California (Chan, 2014; Berry, 2012; Grove 2009). Social-ecological resilience is an ecologically derived concept, and as such it has been critiqued for overlooking issues of human agency and power which inform social action (Chan, 2014; Mayer, 2017). This study hopes to address those deficiencies through the integration of qualitative methods. Through this approach, the hope is to empower community members to share their experiences and emphasize a diversity of voices with regards to green space use (Chan, 2014). By analyzing social-ecological resilience at a grass-roots level, we strive to highlight the importance of informal green space that can offer meaningful ecosystem services but may oftentimes be overlooked because of deeply embedded power imbalances and economic drivers. This research is especially timely now that the COVID-19 pandemic has ushered in a wave of interest in increasing equitable access to urban green space to make cities more resilient.

CHAPTER TWO: THE POMONA CONTEXT AND LITERATURE REVIEW

2.1 Overview

An environmental assessment conducted in 2019 examined the presence of informal green spaces in Pomona and found that 80% of the informal green spaces in the city were community gardens. As a type of collectively managed urban environmental commons (Chan, 2014), community gardens provide an opportunity to understand urban social-ecological interactions at a grassroots level during COVID-19.

Chapter Two discusses the background of social-ecological resilience, including relevant literature, and provides an in-depth overview of the Pomona context.

2.2 The Pomona Context

The City of Pomona is the seventh largest city in Los Angeles County (City of Pomona General Plan, 2014). It grew from 87,400 in 1970 to 162,000 by 2006 at almost double the rate of population growth in Los Angeles County (City of Pomona General Plan, 2014). Along with rapid urbanization came a demographic shift that redefined the city from 30.5% Latino/a in the 1980's census, to 64.47% Latina/o in the 2000 census (City of Pomona General Plan, 2014). Today, Pomona is still predominately Latina/o (72%) with a population of 151,691 and a shrinking proportion of vacant land at only about 4% (U.S. Census Bureau, 2020; City of Pomona General Plan, 2014).

Consistent with trends found in the literature, as the racial and ethnic composition of the city shifted, there was also a change in the socio-economic status of the community (Bluestone, Stevenson, & Williams, 2008). The poverty level in Pomona increased by 18% (22,648 residents), from 1980 to 2005 (City of Pomona General Plan, 2014). According to the U.S. Census, the median household income in 2018 was \$55,115 dollars; 20% of the population lived

in poverty. Prior to the pandemic the unemployment rate for the city was around 5% (U.S. Bureau of Labor Statistics, 2020). According to the U.S. Bureau of Labor Statistics, as of October 2020, the unemployment rate in Pomona was 15.5%, significantly higher than the California unemployment rate of 11.4% (State of California EDD, 2020). As unemployment mounted there has been a ripple effect in the number of people facing food shortages (Rojas, 2020). Food banks and food drives in the city have been overwhelmed with an influx of families needing assistance (Rojas, 2020).

2.2.1 Green Space and Environmental Justice

Once described an “urban garden” in the 1800’s, the City of Pomona now has 1.49 acres of green space per every 1,000 residents, significantly less than the Los Angeles County average of 8.10 acres per every 1,000 residents (County of Los Angeles Public Health Department, 2018). For a variety of reasons, there is a need to increase access to urban green space for the Pomona community, this includes EJ.

The field of EJ emerged in the late 1970’s and early 1980’s from the need to bring attention to and organized action against environmental risks disproportionately placed in minority communities. It also explored why those communities were devalued in the first place, paying special attention to identifying the underlying factors that contributed to observed unjust outcomes of interest (Schlosberg, 2013). The law in California defines EJ as “the fair treatment of people of all races, cultures and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws” (CalEPA, 2018 p 3). EJ represents a vision towards a state where income and the racial composition of community members are no longer indicators of environmental pollution burdens in their neighborhoods (CalEPA, 2018).

More recently, there has been what some researchers describe as an emergent frontier in EJ literature that has expanded the traditional thinking of EJ by focusing on positive contributions of natural environments and connecting the inequitable distribution of nature-related benefits to health disparities often found across socio-demographic groups (Jennings et al., 2016). One example of the essential contribution of natural environments is their ability to improve air quality in urban areas (WHO, 2016).

The lack of green space in the City of Pomona leaves residents especially vulnerable to poor air quality. According to the pollution indicators in the CalEnviroScreen³, some areas in the city of Pomona are estimated to be at the 91 – 100 percentile. This means that certain areas of the City of Pomona have the highest pollution burden in the state—higher than 91-100% of all census tract in all of California. Figure 1 depicts a map of population burden scores for the City of Pomona (OEHHA, 2021).

³ Under the direction of the California Environmental Protection Agency (CalEPA) the California Office of Environmental Health Hazard Association created the CalEnviroScreen as a tool to help identify areas in California most impacted by pollution and where people are especially vulnerable to pollutions effects (OEHHA, 2021).

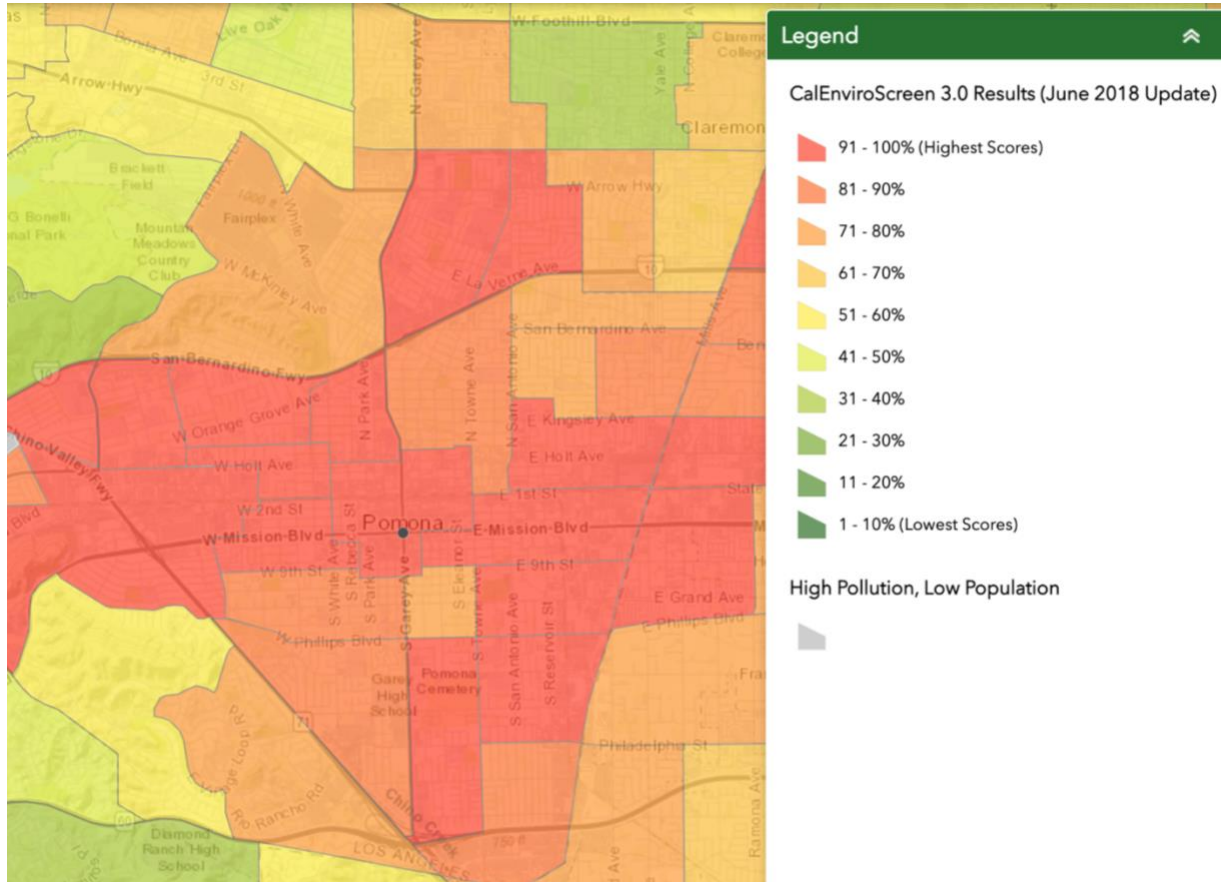


Figure 1. Map of Pollution Burden Score for Pomona. Source OEHHA, 2021

Additionally, in certain areas of the city, the CalEnviroScreen population characteristic indicators that represent biological traits, health status, and community characteristics that can lead to a higher vulnerability to the effects of pollution, are within the 90 – 100 percentiles in some areas of the City as depicted in Figure 2. This means that Pomona residents are more likely than others in California to deal with higher exposures to pollution, but also have health conditions and other socioeconomic factors that make them more vulnerable to negative health effects associated with the pollution burden (OEHHA, 2021).

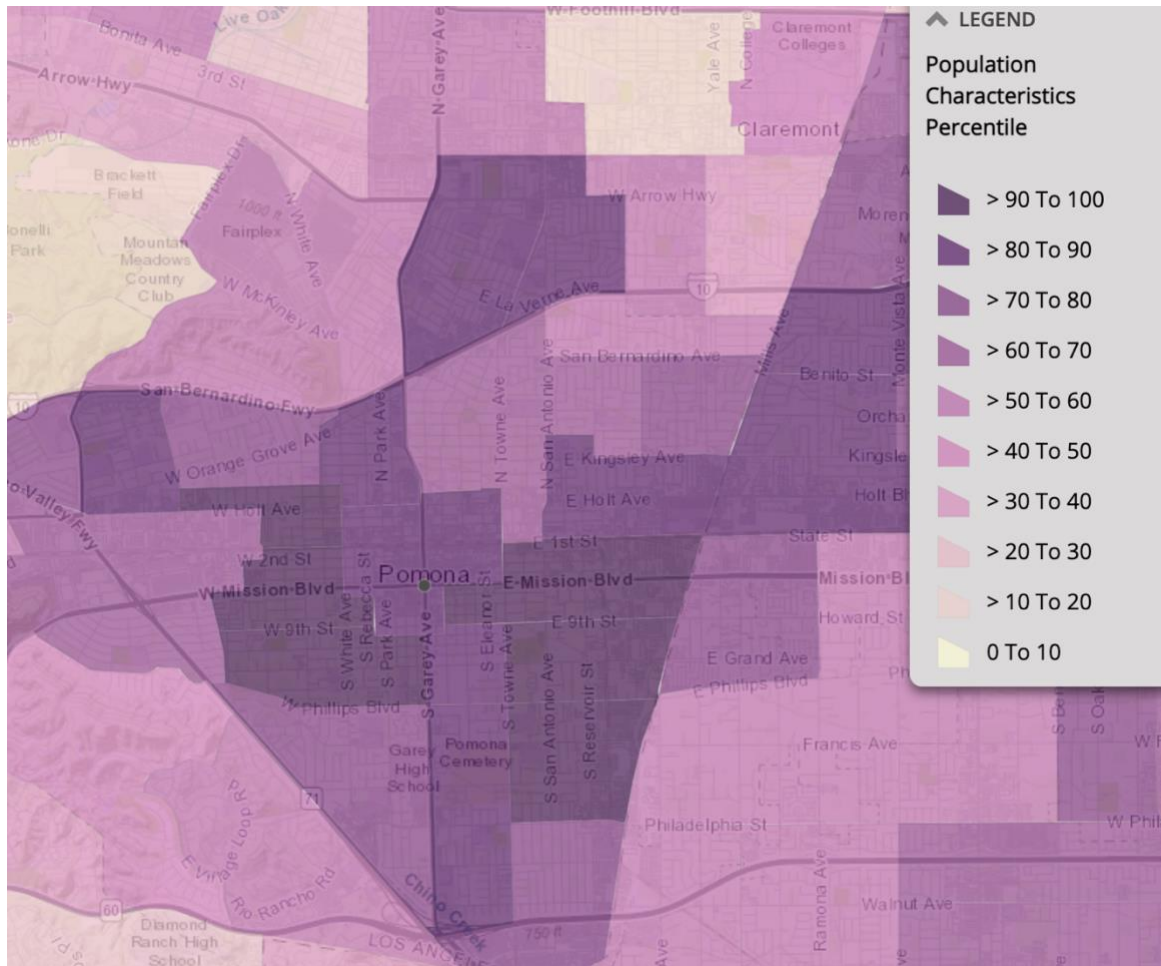


Figure 2. Population Characteristics scores in Pomona. Source OEHHA, 2021

Urban green space can directly reduce air pollution as plants absorb toxic gases, especially from vehicle exhausts, which are a major component of urban smog (Nowak et al., 1996). Carbon dioxide, a main contributor of the greenhouse effect, can also be reduced by urban vegetation in two primary ways. First, plants, through photosynthesis, absorb carbon dioxide and release oxygen in return (McPherson et al., 1993). Secondly, when extensive urban green space cover reduces the heat island effect in an urban area, residents use fewer resources in the form of fossil fuels to cool buildings, thereby reducing power plant emissions of carbon dioxide (McPherson et al., 1993). In general, research suggests that balancing urban green infrastructure,

especially in areas with low amounts of green space, would greatly improve both local and city-wide urban air quality (EPA, 2021).

However, balancing urban green space infrastructure in park-poor communities is a complex task. As aforementioned, there is a significant challenge researchers face when trying to analyze green space access and EJ--namely that there is no consensus among scholars as to how to measure green space access or how to define it (Wolch et al., 2014). Most research on urban green space and health is centered on formal urban green spaces such as parks, or green cover (Wolch et al., 2014; Bedimo-Rung et. Al., 2005; Kuo et al., 1998), yet relationships between park access and race/ethnicity have been found to be complex in EJ literature (Wolch et al., 2014).

The overarching assumption gleaned from research on and planning, and management of parks is that all parks are generally the same, and that having more parks is always better than fewer (Ibes, 2014; Gold, 1972; Harnik, 2010; Jacobs, 1961). This does not take into account that standardized park models and people-park ratios do not always yield ecologically and socially functional parks (Ibes, 2014). Instead, in many urban areas prototypical park models have sometimes resulted in underutilized, inequitable, and dangerous public spaces (Boone, Buckley, Grove, & Sister, 2009; Madanipour, 1999; Marne, 2001; Massey, 1994; Weisman, 1992; Whyte, 1980). Also, in some cases, parks may not provide the ecological benefits of *green* spaces due to lack of vegetation and trees in their design.

Furthermore, the demand for urban green space does not take into account place-specific considerations (Ibes, 2014). This has resulted in reductionist strategies to address EJ and health concerns--namely, the introduction of parks to park-poor communities (Wolch et al. 2014). This strategy has led to what some researchers describe as an 'urban greening paradox' (Wolch et al.

2014). Insomuch as the addition of new formal green spaces may address EJ concerns, and make a community more aesthetically pleasing, and healthier, it could also ultimately lead to environmental gentrification leading to displacement thereby further perpetuating environmental inequalities (Wolch et al., 2014).

2.2.2 Environmental Assessment

To consider place-specific considerations and inform my dissertation, I conducted an environmental assessment of several City of Pomona parks in 2019. The environmental assessment included 3 independent cross-sectional observations for formal urban spaces in the city (e.g., parks). A total of 3 assessments were conducted at each park between September 16, 2019 and September 28, 2019. Each park was assessed during a weekday morning (8:30am-10:30 am) and evening (3:30-7:30 pm), and on a weekend either Saturday or Sunday (between the hours of 8:30 am- 3:30 pm). Data collectors were trained to observe and code park-user characteristics, such as approximate age and transient status. The subgroups of interest were infants (1-11 months), young children (1-5), children (6-10), adolescents (11-17), adults (18-64), seniors (65+), and transients. For a more in-depth description of the sample and methods used for the environmental assessment see APPENDIX A.

According to the findings of the environmental assessment in Pomona, park utilization varied in that some parks were utilized more compared to others. Evidence of environmental injustice emerges from studies of why parks may go unused (Wolch et al., 2014). Of the limited formal green space that is available to Pomona residents there seems to be more complex issues that further limit its accessibility. One explanation could be that underutilization results if a park space is perceived as being unsafe (Wolch et al., 2014). This aligns with the concerns identified by families in a Childhood Summit put on by the Pomona Unified School District in

collaboration with the Pomona’s Promise Collaborative Initiative on May 1, 2019. The top three priorities identified by families in attendance were universal preschool followed by access to safe parks and increasing the number of trees and green space in Pomona.

A density analysis of park use was conducted by distributing the number of users across park space based on the quantity that was measured at each park. Based on the findings, parks in the south part of Pomona were used more than parks in the north as depicted in Figure 3 below. Notably, the parks with the most user activity had outdoor sports programming at the time of the assessment.

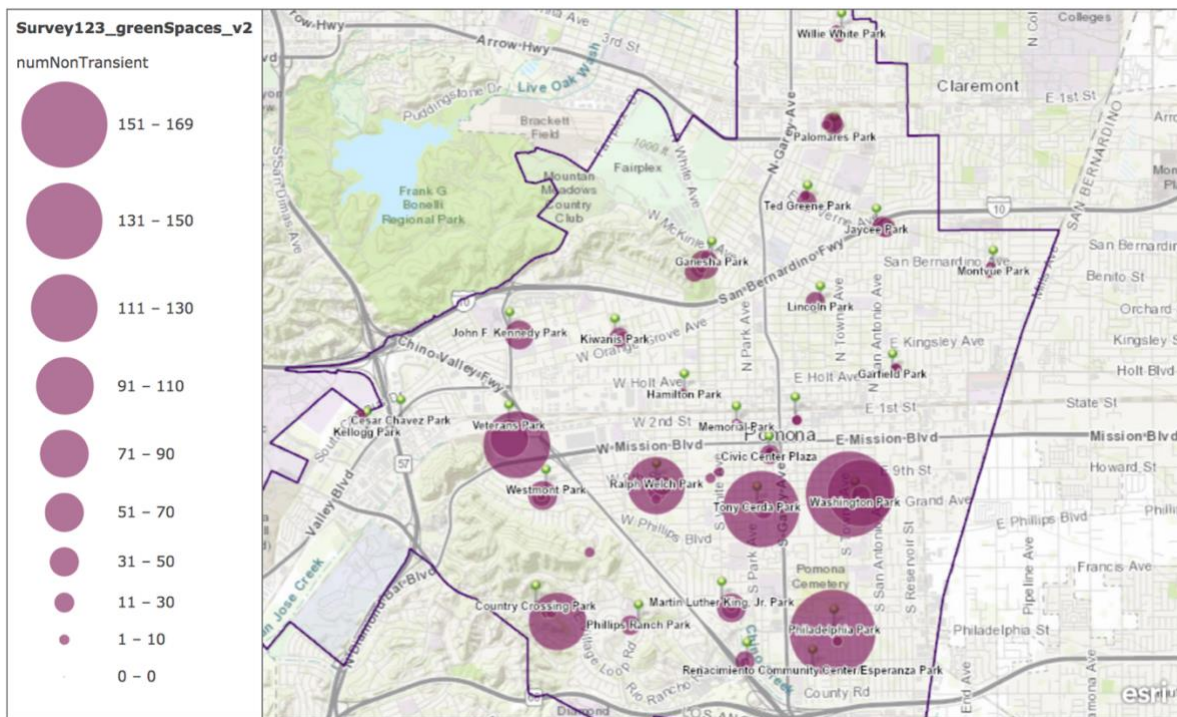


Figure 3 . Map of Non-transient Users, All Ages, by Park

Source: Final Practicum Deliverable (Preciado, 2019)

Density maps of formal green space utilization by all subgroups with the exclusion of the transient subgroup. Note: the green pins on the map are parks in Pomona

The assessment also demonstrated an inverse relationship between uses by specific subgroups. Transient utilization of formal parks may have impacted park uses by other

subgroups of interest (e.g., infants, young children, adolescents, adults, and seniors). See Figure 4 below.

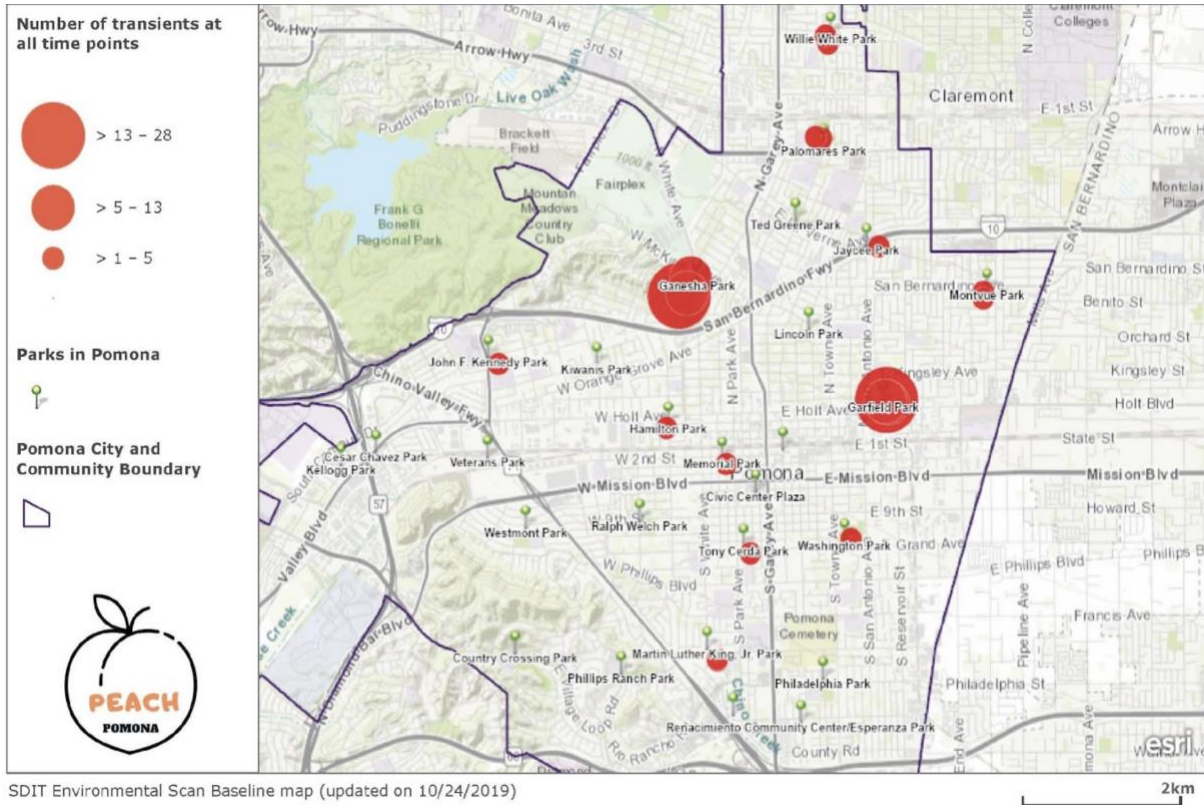


Figure 4. Map of Transient Users by Park

Source: Final Practicum Deliverable (Preciado, 2019) *Density map of formal green space utilization by transient subgroup in the city of Pomona.*

An additional density analysis was conducted to take the observed quantities of park space users of interest--in this case transients--and distributing them across the Pomona landscape based on the quantity that was measured at each park. These findings revealed that the parks in the north part of Pomona were utilized more per square mile by transient populations. Here there was an inverse relationship regarding subgroup use such that as transient use in parks increased, use by other subgroups of interest decreased.

For informal green space, the aim was to document the existence of actively utilized informal green spaces in the community. Informal green spaces were identified with the help of a collective impact group in the City of Pomona entitled Pomona’s Promise. Due to the transitional nature of informal green space, a major limitation from this assessment was the possibility that not all informal green spaces in the city were captured. Despite this potential shortcoming, the data capture was relevant because it provides information about the type of informal green spaces that have emerged in the city and the needs they aim to address. Figure 5 below was generated as a visual representation of the gardens observed in Pomona.

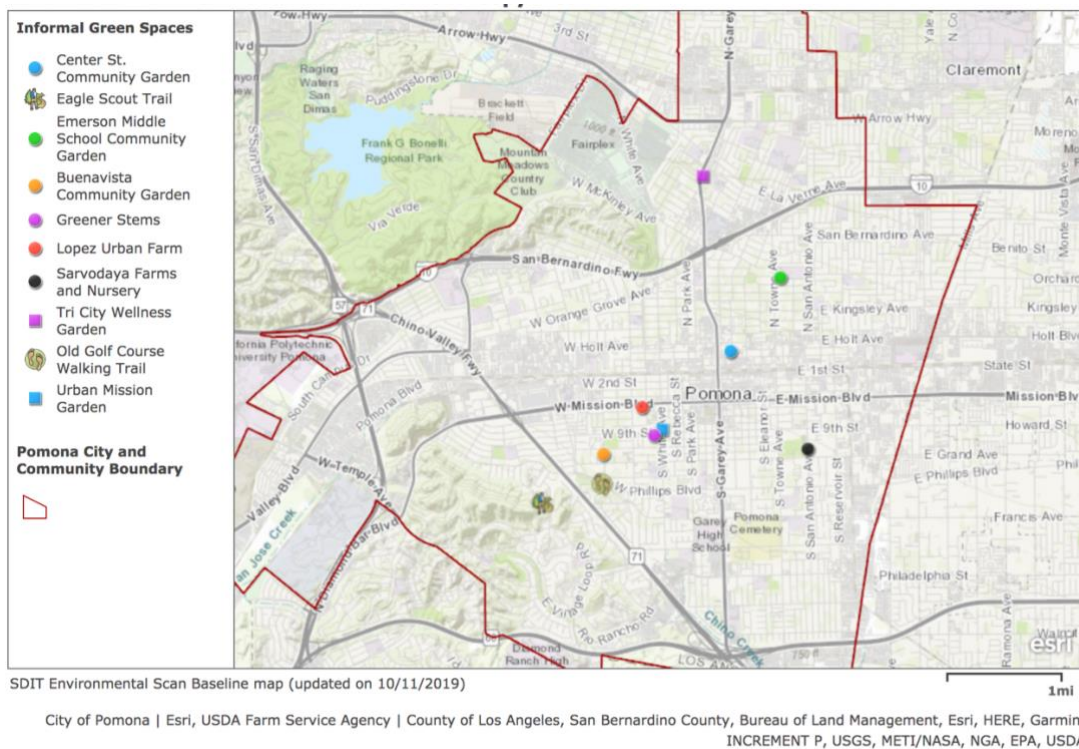


Figure 5. Map of Informal Green Spaces

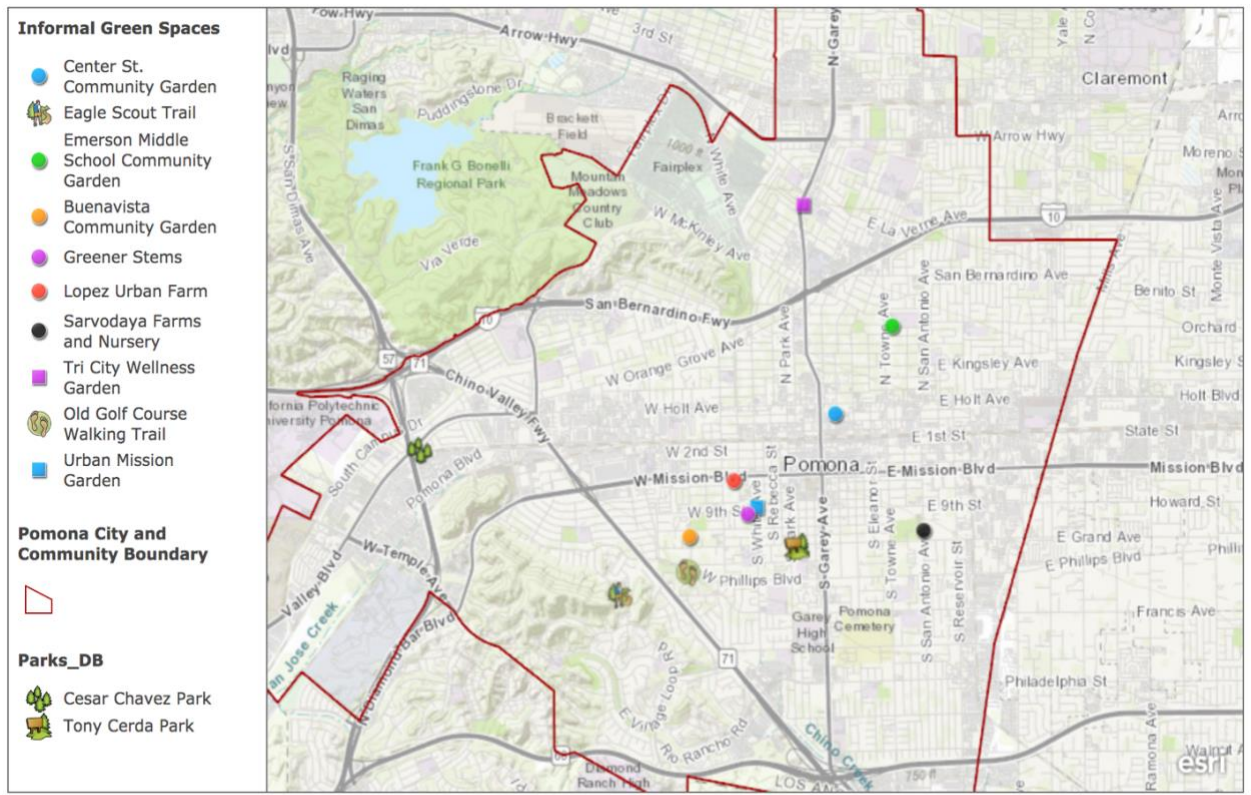
Source: *Final Practicum Deliverable (Preciado, 2019)* Informal Green Spaces were geocoded through the process of transforming a narrative of a location (e.g., the name of a place) to a specific location on the earth’s surface (Esri, 2020).

Figure 5 depicts a textual description of a location translated into coordinates that have been plotted on a map (Esri, 2020). The locations were then output as geographic features-- either community gardens, or walking trails (Esri, 2020).

2.3 Community Gardens in Pomona

The American Community Garden Association (ACGA) describes community gardens as a space that can grow flowers, vegetables, or community. Gardens can be found in urban, suburban or rural areas as a community plot, or individual plots. They can be located at a hospital, school, or in a neighborhood. They can also be a series of plots dedicated to urban agriculture where produce is grown for a market (ACGA, 2014). The key features that distinguish community gardens from home gardens are a sense of public ownership, access, and democratic governance (Ferris, Norman & Sempik, 2001). Community gardens also vary in the function that they intend to serve, with some intentionally planting food, while others grow ornamental plants, or a combination of the two (Holland, 2004).

During the data collection process of this study, I was informed of two emergent gardens in formal green space. They have been geocoded in Figure 6 along with the informal garden sites identified in the environmental assessment (*described in Section 2.2.2*). It is important to note where these gardens emerge as it may inform place-specific considerations as to the purpose and practices of the gardens and the people who steward them. These differences may ultimately impact their resilience outcomes. I will explore this further in Chapter 3.



SDIT Environmental Scan Baseline map (updated on 10/11/2019)

City of Pomona | Esri, USDA Farm Service Agency | County of Los Angeles, San Bernardino County, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA

Figure 2. Informal and Formal Garden Sites in Pomona

In Pomona, the majority of the community gardens (n=6) identified were found in informal green space. This means that they were found in areas not earmarked by city officials as green space per the most updated General Master Plan (City of Pomona General Plan, 2014). However, two of the gardens identified emerged on formal green space located on land that has been earmarked as green space (City of Pomona General Plan, 2014). The formal gardens emerged in Tony Cerda Park and Cesar Chavez Park as depicted in Figure 6.

2.4 Community Gardens' Role During COVID-19

This study aims to further explore the community gardens' contribution to SER during COVID-19. Some community gardens ameliorated pandemic-related economic losses by supplementing community garden users' diets with nutrient-dense foods (Mejia, et al., 2020; Lal, 2020). Although supply chain practices were able to mitigate the empty shelves we witnessed early in the pandemic, maintaining access to culturally relevant foods can be a challenge for communities of color and immigrants during times of crises (Aronson, 2014). Small businesses that sell culturally specific specialty food items are particularly vulnerable due to limited shipping from other countries and disruptions in food supply chains. Thus, community gardens may play an integral role in Pomona through possible alleviation of food insecurity during the pandemic. COVID-19 poses unique challenges on communities, therefore there is a need to analyze the role of gardens in the wake of COVID-19.

Additionally, community gardening has been found to increase social capital, social connectedness, and social support (Kingsley and Townsend, 2006). In some communities--especially after trauma, disaster, or disruption--gardening has been used to promote community healing (Mejia et al., 2020). Research has linked community gardens as sites to maintain existing connections--even when these interactions occur in socially distant ways (Mejia et al., 2020). More recently, a longitudinal study published in the *International Journal of Epidemiology* found that adults in neighborhoods where at least 30% of nearby land was green space had 26% lower odds of cumulative incidents of loneliness compared to their peers in areas with less than 10% green space. Researchers argue that urban green space may reduce loneliness by providing opportunities for social reconnection and supporting processes such as stress relief. The contribution of community gardens and green space to social connectedness is especially

relevant as individuals grapple with loneliness during the pandemic, which speaks to the importance of urban planning as a tool to combat the disruptions posed by COVID-19.

2.5 Impacts of Loneliness

Experts are justifiably concerned about the mental and physical health ramifications that widespread loneliness could cause—especially because there is not consensus upon the tipping point at which acute loneliness transitions into a chronic issue with long-term consequences (Wickens et al., 2020). Loneliness significantly increases an individual’s risk of premature death from all causes—a risk that rivals those of smoking, obesity, and physical inactivity (CDC, 2021; NASEM, 2020). There is a growing body of literature associating chronic loneliness as a predictor of future depression, paranoia, and social anxiety (Wickens et al., 2020). Longitudinal studies have also linked loneliness to coronary heart disease, stroke, cognitive decline, dementia, and premature death including via suicide (Astell-Burt, 2021; Valtorta et al., 2016, Donovan et al., 2017; Shankar et al., 2013; Holwerda et al., 2014).

Though efforts have been made for a personalized approach to address loneliness, evidence thus far suggests that many person-focused interventions have little to no effect (Astell-Burt, 2021; Masi, et al., 2011; Gardiner et al., 2018). As a result, the US National Academies of Sciences, Engineering and Medicine made a call for research and policy options to address the issue of loneliness. This led to a strategy from the UK: shifting the focus of potential intervention from person-focused to a community context including places outside of the home and workspaces (e.g., ‘third places’) (Oldenburg, 1989) where people can foster social relationships and meet. As the UK strategy noted, green spaces are essential and appealing as free-to-enter settings that enable nourishing pastimes and transformative interactions that foster greater senses of belonging (Astell-Burt, 2021; Neal et al., 2015; Francis et al., 2012). Investigating how to

utilize natural spaces in cities, in order to mitigate some of the psychosocial ramifications of the present public health emergency involving loneliness, is undoubtedly relevant now more than ever.

The presence of urban green space in the form of informal community gardens adds to the urban green-space landscape in the city of Pomona, and the addition of gardens in formal green space may impact their utilization and perceptions of safety, thereby increasing green-space access. This is relevant because, as mentioned above, a recently conducted, longitudinal study published in the *International Journal of Epidemiology* found that adults in neighborhoods where at least 30% of nearby land was green space had 26% lower odds of becoming lonely compared to their peers in areas with less than 10% green space (Astell-Burt, et al, 2021).

Although rapid urbanization has seemingly widened the gap between individuals and the natural environment, there has been a surge of popularity and organizational support for urban agriculture (Chan, 2014; Berry, 2012; Draper & Freeman, 2010). As of 2014, approximately 18,000 community gardens have been cultivated across the U.S. (Chan, 2014; AGGA, 2014). As a type of collectively managed urban environmental commons, community gardens provide an opportunity to understand urban social-ecological interactions (Chan, 2014).

In cities, community gardens serve as physical manifestations of the interconnectedness and interdependence of humans and nature through the complex interactions of the land and those who use the gardens (Chan, 2014). This is especially so inasmuch as these spaces emerged to meet a need, highlighting the inextricable link between urban life and the natural environment. Therefore, community gardens can serve as a means to understand human culture and the environment and how one shapes the other (Chan, 2014).

2.6 Resilience Theory and Social-Ecological Applications

Contemporary scientific understanding of ecology, as seen expressed within resilience theory, offers a distinct lens to understand the interconnections between people and cities (Berry, 2012; Walker and Salt, 2006). Resilience theory is based on a systems approach founded on the belief that no system, either natural or man-made, is immune from change for long (Berry, 2012; Garvin, 2012). In 1973 Ecologist C.S. Holling introduced the concept of resilience. Holling (1973 p. 14) defined it as, “the persistence of systems and their ability to absorb change and disturbance and still maintain the same relationships between populations and variables.” Important to note, is that a system is not a random collection of things, but rather an interconnected set of components that is rationally organized for a purpose (Meadows, 2008). Therefore, a system must contain three key things: elements, connections, and a purpose (Meadows, 2008).

Rather than promote the interconnectedness between people and nature, the environmental law establishment of the United States is founded on a dualistic ideology that people are separate from nature (Berry, 2012). Berry (2012, p 121) argues that “this dualism similarly pervades our cultural view of cities: town versus country, urban versus rural, natural versus human built.” These dualistic perspectives are grounded on an antiquated assumption that, if human intervention is taken away, equilibrium is the normal status of nature (Berry, 2012; Garvin, 2012). This dualistic philosophy creates problematic borderlines between nature and humans (Berry, 2012).

Though as a society we are striving for “greener” designs in cities, Berry (2012) argues that fundamental values, perceptions, and attitudes are the key drivers for policy decisions. Therefore, we must work to debunk the myth that humans are separate from nature and instead

envision a city in which we embrace their interconnectedness as a cohesive social-ecological system (Berry, 2012).

To do this requires a transcending of the urban-versus-nature divide through systems thinking (Berry, 2012). The COVID-19 crisis and climate change have created a sense of urgency for the future and wellbeing of humans in urban environments (The Trust for Public Land, 2020; Berry, 2012). Berry (2012 p 122) argues that, “by cultivating a genuine connection between humans, the natural environment, and the built environment we can overcome this divide and, in turn, make cities more resilient in an ever-changing world.” However, this transition will only occur through profound changes in the worldview, assumptions, and priorities of policy makers (Berry, 2012.).

Resilience theory is used to understand environmental systems that are adaptive, complex, and predisposed to unpredictable change (Berry, 2012). Contemporary applications of resilience theory use the term “resilience thinking.” Resilience thinking has been used for the management of environmental resource systems to enhance their resilience (Walker and Salt, 2006). One popular paradigm of resilience thinking is social-ecological resilience applications; they have been used to address complex challenges and uncertainties in urban environments (Chan, 2014; Berry, 2004; Grove, 2009). Social-ecological systems have their own unique form of resilience that moves beyond the resilience of humans or ecosystems individually (Goldstein, 2009). Instead, the interaction between the humans and their ecosystem creates a unique new form of system: a social-ecological system (Berry, 2012).

As a complex adaptive system, a social-ecological system is predisposed to unpredictable change and we must recognize everything is interconnected (Berry, 2012). Chan (2014 p 1) defines social-ecological resilience as “the capacity of a complex adaptive system,

such as a farm, a neighborhood, or a city to respond and adapt to disturbances and still maintain their essential structure and function.” Meadows (2008) stated that the most spectacular feature of complex adaptive systems is their innate ability to learn, evolve, self-organize, and diversify. A social-ecological system’s ability to do this plays a critical role in its resilience (Chan, 2014; Folke, Colding, & Berkes, 2002). It enables the social-ecological system to generate knowledge, learn, and build persistence through collective action (Caniglia et al., 2017; Folke et al., 2010; Walker et al., 2004). It also allows social-ecological systems to respond to and transform ecosystem dynamics in an informed manner (Caniglia et al., 2017; Folke, 2006).

2.6.1 The Need to Include EJ in Resilience Thinking

Researchers argue for the need to expand the fit between EJ and sustainable development to include resilience thinking in order to provide opportunities to examine social-ecological issues from the ground up (Mayer, 2017; Agyman 2005). Resilience is oftentimes perceived to be apolitical and, despite its rapid application in a variety of fields, attention to the sociocultural context in which it occurs has not been widely explored in the literature (Mayer, 2017; Cote and Nightingale, 2012). Researchers argue the need for shifting the application of resilience thinking to a grassroots level through the integration of EJ principles (Mayer, 2017). This process could ensure that all groups are included in resilience-building (Mayer, 2017). The integration of EJ principles and resilience thinking is critical in shifting attention to the role of the social sphere in a social-ecological system (Mayer, 2017). To that end, this study aims to incorporate EJ principles to explore community gardens’ ability to cultivate SER, paying specific attention to the social sphere in a social-ecological model.

Research has demonstrated the potential for community gardens to cultivate social-ecological resilience and specifically respond to crisis (Chan, 2014; Okvat & Zautra, 2014).

Studies point to the ability of community gardens to foster environmental and social learning, and increase biological and social diversity (Chan, 2014; Colding & Barthel, 2013) specifically by being sites of civic ecology practices which can ultimately enhance urban resilience (Chan, 2014; Kransy & Tidball, 2009; Kransy & Tidball, 2012)

2.7 Public Health Significance

Implementing strategies that advance equitable access to green space while challenging the presumed inevitability of environmental gentrification is especially important now as cities are reevaluating their relationship with nature in the wake of COVID-19 and other pressing environmental challenges (The Trust for Public Land, 2020). The research presented here is especially relevant as it will shed light on how the potential needs of some vulnerable groups, such as low-income individuals, could be addressed in the future of public green spaces, designs, and practices. The COVID-19 pandemic provides an opportunity to integrate a health perspective into planning in new and innovative ways. By exploring the contribution of community gardens to SER during COVID-19 in the City of Pomona, we may be able to leverage the crisis to increase knowledge towards building more just, healthier, resilient, and greener cities (Honey-Roses, et al., 2020).

CHAPTER 3: STUDY DESIGN AND METHODS

3.1 Overview

This study used a comparative mixed method case study design (Creswell and Plano-Clark, 2018) to achieve its aims. Qualitative methods included key-informant interviews. Quantitative methods included a survey of key-informant interview participants that assessed loneliness to better understand the social connections embedded in the gardens. The research conducted informed aims one and two of the study: (1) assess perceived loneliness of community garden users, and (2) capture the experiences of community garden users during COVID-19. The outcomes of the research informed aim three: (3) gain insight into the garden site characteristics that differentiate informal and formal community garden practices. An adapted version of Krasny and Tidball's (2012) Conceptual Model for Civic Ecology was used as the theoretical foundation of the study, providing the study's guiding structure.

3.2 Research Theory

Marianne E. Krasny and Keith G. Tidball developed the Conceptual Model for Civic Ecology in 2012 to provide a structure that identifies the origins, process, and outcomes of resilience of civic ecology applications. For the purposes of this study, I focused on the social sphere of the model. SER is an ecologically derived concept; as such its application has been critiqued for overlooking issues of human agency and power which inform social action (Chan, 2014; Mayer, 2017). This study aims to address those deficiencies through the integration of qualitative methods. Through this approach, we hope to empower community members to share their experiences and emphasize a diversity of voices with regards to community garden use (Chan, 2014). By centering this study on the social sphere of the model, we strive to highlight the importance of green space that can offer meaningful social supports and ecosystems services but

may oftentimes be overlooked because of deeply embedded power imbalances and economic drivers (Chan, 2014).

By integrating an adapted version of the Conceptual Model for Civic Ecology into the design of the current study and operationalizing the findings through knowledge mobilization, the potential to improve green space access in the city of Pomona is increased. Figure 7 provides the diagram of the adapted model. The original Conceptual Model for Civic Ecology (Kransy and Tidball 2012, p 272) can be found in APPENDIX B.

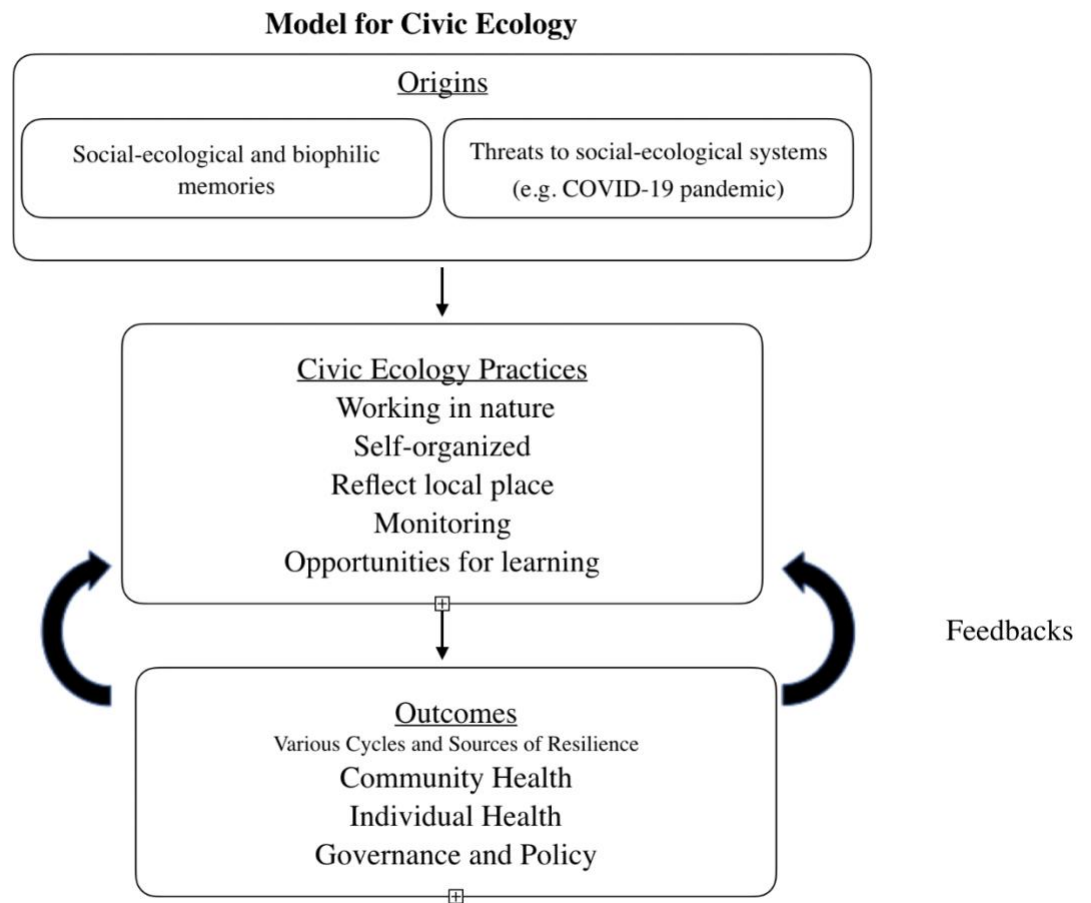


Figure 7. Adapted Model for Civic Ecology

Source: Figure based on Conceptual Model for Civic Ecology from Kransy and Tidball (2012, p 272)

According to Kransy and Tidball, civic ecology practices are self-organized and self-managed stewardship initiatives that reflect a local place and are deemed as opportunities of learning through working in nature (Kransy and Tidball, 2012). These civic ecology practices often take place in a variety of informal open spaces such as abandoned lots or formal green space through community forestry (Chan, 2014; Kransy & Tidball, 2012). Generally, these initiatives start small after a prolonged period of decline, or after a major disruption, such as COVID-19 (Kransy and Tidball, 2012).

The theory describes the origins, process, and outcomes of resilience of civic ecology practices. According to Kransy and Tidball (2012), civic ecology practices occur when tipping points are reached within a system by a disturbance or threat. The disturbances or threats could be prolonged, such as economic and environmental decline, or acute, in this case COVID-19, that forces the system to take on new processes. Although initially tumultuous, the change provides the opportunity for reorganization and rebuilding (Kransy and Tidball, 2012).

The model describes five attributes of civic ecology practices: working in nature, reflecting on local place, self-organized, monitoring, and providing opportunities for learning (Kransy and Tidball, 2012). The practice of working in nature involves direct contact with nature and, therefore, can promote mental and physical wellbeing (Kransy and Tidball, 2012). The practice of reflecting on local place refers to the ability of civic ecology practices to attribute meaning to an otherwise highly urbanized environment by bringing “both seeds and practical horticultural knowledge from historic and rural cultural traditions, which may be used to recreate green spaces similar to those in their ancestral or homeland” (Kransy and Tidball, 2012, p 268). In turn these spaces store experiential knowledge and pass on these practices to future generations (Kransy and Tidball, 2012; Barthel et al., 2010).

The practice of self-organizing refers to the emergence of larger-scale patterns from independent smaller-scale processes. Self-organization is tightly linked to citizen participation and refers to the scalability of civic ecology practices which can expand from small-scale efforts to encompass larger scale outcomes (Kransy and Tidball, 2012). For example, the actions of city residents who reach a tipping point of shared frustration with the status quo and organize themselves to convert an empty lot and replace it with soil to grow trees embody a form of community-based organization. This smaller scale process could then contribute to a landscape that provides ecosystem services for residents in a larger scale (Kransy and Tidball, 2009).

In some cases, resident engagement in civic ecology practices leads to the monitoring of outcomes of their projects (Kransy and Tidball, 2012). This monitoring represents a type of information feedback loop that allows participants to adapt their practices based on the data they collect in a co-management process (Kransy and Tidball, 2012; Armitage et al., 2007). This form of social learning highlights the interactions between participants and their social and physical environments and are also useful in understanding how knowledge is passed on to future generations (Kransy and Tidball, 2012).

In the wake of social, environmental, economic, and public health challenges posed by COVID-19, civic ecology practices (Chan, 2014, p 21) “invest in human, social, and ecological capitals of local communities to help develop capacity.” Although there is a mounting body of literature on civic ecology, there are limited studies using the civic ecology conceptual framework as the driving basis of analysis (Chan, 2014; Kransy & Tidball, 2009; Kransy et al. 2012). This study will focus on applying this model to better understand the specific civic ecology practices that contribute to SER in Pomona.

3.2.1 Application of the Model

The Conceptual Model for Civic Ecology was used to inform the creation of interview questions and deductively analyze qualitative data. The model was used when asking questions of community gardeners' experiences during COVID-19. The Conceptual Model for Civic Ecology was integrated by taking its five components of civic ecology practices (working in nature, reflecting on local place, self-organizing, monitoring, and providing opportunities for learning) and asking how they relate to community gardening experiences during COVID-19.

3.3 Study Design and Methodology

This study used a comparative mixed method case study design (Creswell and Plano-Clark, 2018) to achieve its aims. Qualitative and quantitative methods were included in key-informant interviews. Quantitative methods included a loneliness and demographic questionnaire of interview participants. Qualitative methods included open-ended questions regarding participant experiences during COVID-19.

Mixed methods were necessary to meet this study's aims and provide different but complementary information to strengthen the research. Qualitative methods were essential because they captured the feelings, experiences, and perspectives that are not easily captured with quantitative data. The need to capture the thoughts and experiences of community garden users was especially important because this study is centered on the social sphere of social-ecological systems. The questionnaire (described below) was also important, for it provided demographic and loneliness data about community garden users to combine the data collection methods, the study converged data from the questionnaire and interviews. The study was reviewed and declared exempt by Claremont Graduate University's Institutional Review Board in April 2021 because it is not a systematic investigation with the intent to contribute to

generalizable knowledge. The approved consent form for this study can be found in APPENDIX C.

3.4 Data Collection and Sampling

Key-informant interviews were conducted with community garden users or managers who met the following criteria: 18 years of age or older, Pomona resident, fluent in either English or Spanish, had access to a telephone, active status as community garden user/manager from January 2020 to May 2021 and available in the study timeframe. All study participants received a \$30 gift card to Home Depot for their participation. Funding for the study was made possible by a Community Wellness Grant from City of Hope⁴. Interviews were conducted between April 28, 2021 to May 13, 2021, dates that were aligned with over a year into the pandemic.

3.4.1 Recruitment Strategy

In ethnography, the primary strategy is purposive sampling of participants based on the researchers' judgement about what potential participants will be the most informative and willing to act as a representative in revealing and interpreting experiences (Moser & Korstjens, 2018). We were less interested in drawing a representative sample to make generalizable statements, than generating an understanding of a range of experiences specific to residents of Pomona (Chan, 2014). To that end, from our preliminary work, we drew a diverse purposive sample, followed by snowball sampling.

The environmental assessment conducted in 2019 enabled me to build rapport with community garden managers, and from that I was able to create a contact list of potential

⁴ The City of Hope established the Healthy Living Grant Program to support community-led efforts that promote healthy living. The Healthy Living Grant program provides \$5,000 grants to groups that can demonstrate sustainable and collaborative approaches to promoting healthy living for vulnerable populations within the Greater Los Angeles regions (City of Hope, 2021).

participants from each garden for the interviews. I reached out to a variety of individuals based on their affiliation with community garden sites (n= 8) and asked those who responded to voluntarily identify another one or two individuals from their garden site who might want to participate. To help inform potential participants of the study detailed recruitment flyers were developed and distributed.

Participants recruited through snowball sampling (n=14) were provided information about the study and reviewed to ensure they met the inclusion criteria. To be included in the study participants had to be at least 18 years old, Pomona residents, fluent in either English or Spanish, have access to a telephone, have active status as community garden users/managers from January 2020 to May 2021, and be available in the study timeframe. Community garden members were excluded from the study if they were under 18, did not live in the city of Pomona, were not fluent in either English or Spanish, did not have access to a telephone, were not actively gardening between January 2020 to May 2021, and/or were not available in the study's timeframe (n=3).

Due to the required pandemic social distancing protocol for research required by Claremont Graduate University, the interviews took place over the phone and verbal consent was obtained for participation (APPENDIX C). See Table 1 for an overview of community garden sites represented in the study. As described in Section 3.1, for this study I drew a diverse purposive sample, followed by snowball sampling. Garden managers/users in some sites were more responsive to voluntarily providing information about the study to members at their garden. As a result, some gardens have more representation in the study. Due to social distancing guidelines interviews were conducted over the phone this contributed to the small study sample (N=20).

Table 1. Participants' Garden Sites

Sites
Lopez Urban Farm
Urban Mission Garden
Emerson Middle School Garden/Growing Roots
Sarvodaya Farms and Nursery
Buena Vista Community Garden
Greener Stems/Serenity Garden
Formal Garden Site at Cesar Chavez Park
Formal Garden Site at Tony Cerda Park

3.4.2 Questionnaire

Various demographic factors were assessed including age, sex, education level, race/ethnicity, and marital status (Fuller & Huseth-Zosel, 2021). Age was calculated in years based on reported birth year. Participants identified their sex as male, female, transgender, or gender non-binary. Participants were asked to report their level of education categorized into seven categories:

1=less than high school degree, 2=graduated High School or equivalent, 3=attended college or trade school, 4=graduated college with an Associate Degree, 5=graduated college with a Bachelor's Degree (BA/BS), 6=received a Graduate degree (Master's, PhD, MD, JD), 7=decline to respond. Current employment status was assessed and categorized into nine categories: 1= employed, 2= self-employed, 3= out of work and looking for work , 4=out of work but not currently looking for work, 5= a homemaker, 6= a student, 7= military, 8= retired, 9= unable to work.

Participants were asked to indicate their race and ethnicity with instructions to select all that apply including American Indian or Alaskan Native, Asian, Chinese, Japanese, Korean, Filipino, Black/African American, Hispanic/Latina/os , White/Caucasian, Native Hawaiian or

Other Pacific Islander, Middle Eastern, Other, and do not know. Participants were asked to report their marital status with six categories: 1 = married, 2 = living with partner, 3 = widowed, 4 = divorced, 5= separated, and 6= never married. For income, participants reported the number of people living in their home and were asked to identify the category that best describes their total combined family income for the past 12 months. Categories included 1= less than \$25,000, 2= \$25,000- <\$50,000, 3= \$50,001- <\$75,000, 4= \$75,001- <\$100,000, 5= \$100,001- <\$150,000, 6= more than \$150,000, 7=Don't Know/Not sure, 8= Decline to respond.

The UCLA Loneliness Scale version 3 (Russel, 1996) was used to assess loneliness. The quantitative 20-item assessment was selected as the measure for this study as it has been found to be highly reliable both in terms of internal consistency and test-retest reliability (Russel, 1996). The UCLA Loneliness scale has come to be viewed as the “standard” scale in research (Russel, 1996). Participants were asked questions like the following: “During COVID-19 how often do you feel that you are “in tune” with the people around you? Please indicate how often you feel that way 1= never, 2= rarely, 3= sometimes, 4= always.” The UCLA Loneliness Scale has also been translated and used in Spanish-language studies (Morejon & Jimenez Garcia-Boveda, 1994). The questionnaire containing the UCLA Loneliness Scale can be found in APPENDIX D.

3.4.3 Qualitative Questions

Participants were asked open-ended questions relating to their experiences of community gardening during COVID-19; these questions were derived from Kransy and Tidball's (2012) Conceptual Model for Civic Ecology. Participants were encouraged to provide their open responses to questions such as “To what extent has community gardening impacted your physical activity during COVID-19?” and “How has COVID-19 changed the interactions you have with other people in the garden?” In addition to these two open-ended community garden

related questions, during the interview participants were asked to describe the following: their daily experiences in the garden, how those experiences have changed during COVID-19, their perceptions of interpersonal connections in the garden during the pandemic, and their perceptions of information sharing and social learning in the garden. Participants were asked to explain their experiences in detail. Though these open-ended questions were not explicitly about loneliness, participants provide responses indicative of experiences, feelings, and strategies related to social learning and information sharing that speak to the social connections of community garden users/managers. The key informant questionnaire that includes both quantitative and qualitative questions can be found in APPENDIX D.

3.5 Data Analysis

3.5.1 Quantitative

Basic descriptive statistics and a Pearson's correlation matrix of quantitative variables was used to summarize participant demographics and distribution of perceived loneliness ratings. Quantitative analysis was conducted using SPSS Version 26.0 (IBM Corp., 2019).

3.5.2 Qualitative

Qualitative data analysis began by translating Spanish-language interviews (N=1) into English.⁵ Once I translated an interview, I transcribed it. All English-language interviews (N=19) were transcribed using Otter.ai (Otter.ai, 2021). I managed the qualitative data using Maxqda 20.3.

The analytic strategy for qualitative data was thematic analysis. The process began with deductive coding. Deductive coding begins with an initial set of codes that are usually drawn from a theory (Fletcher et al., 2015; Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005;

⁵ I am fluent in Spanish.

Gilgun, 2011); in this case we drew from the Model for Civic Ecology by Kransy and Tidball (2012). Codes that are derived from the model were used flexibly and new codes were added as necessary to account for additional concepts that arose as the coding progressed (Gilgun, 2011). The model provided the parent codes and the child codes emerged from the data.

3.5.3 Integration

Upon completing the data analysis for both the quantitative and qualitative strands, for the comparative study I selected cases based on the quantitative findings of garden-site characteristics. From this analysis I merged the quantitative and qualitative results to describe the cases (e.g., informal garden site and formal garden site) and facilitate the comparison across the cases in order to make interpretations about the features that distinguished the cases (Creswell and Plano-Clark, 2018). A diagram of the Comparative Mixed Method Case Study is shown in Figure 8.

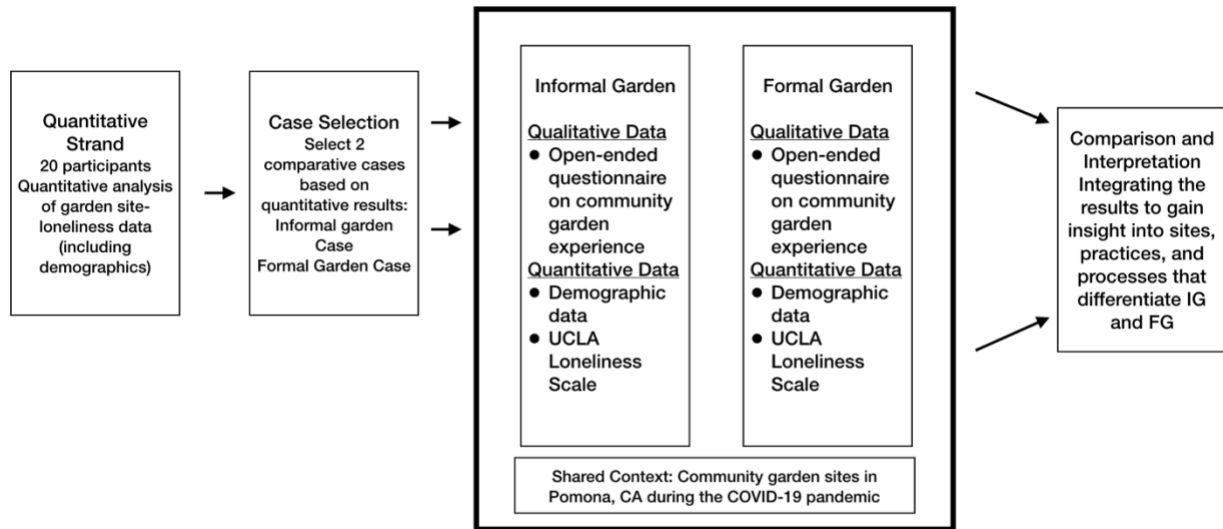


Figure 8. Comparative Mixed Method Case Study

Source: Figure based on Diagram of a Comparative Mixed Method Study Creswell & Plano Clark (2018 p 122).

3.6 Methodology Rationale and Limitations

Mixed methods were necessary to achieve the aims of the study. This mixed methods design is consistent with the basic principles of a case study that focuses on developing more in-depth understanding of cases through the collection of diverse forms of data (Creswell & Plano-Clark, 2018). Qualitative methods were essential as I want to better understand the experiences of community garden users and focus our study on the social domain of social-ecological systems.

This multi-case exploratory study provides an empirical contribution to our understanding of the different functions and meanings of community gardens to social-ecological resilience during COVID-19. However, because this study is exploratory, with a small non-randomized sample its findings are not generalizable. I was less interested in drawing a representative sample to make generalizable statements, instead I want to generate an understanding of a range of experiences (Chan, 2014) in Pomona, California, during the pandemic, in particular. As a scholar-activist, my intent is to provide the results of this study to city stakeholders to advocate for community gardens as a civic priority in Pomona to advance equitable access to green space

It is important to note that a researcher's own background, experiences, and previous understandings are included in an interpretive process of study (Chan, 2014; Creswell, 2006). Therefore, it is important to acknowledge one's own identify and biases (Chan, 2014; Lincoln & Guba, 1985). As the key researcher, I was not a community garden member during the time of these interviews. However, my identity as a life-long Pomona resident may have facilitated rapport and communication with participants.

CHAPTER 4: RESULTS

4.1. Aim One Key Findings

Two key findings emerged from examining the perceived loneliness of community garden users and are described further below: 1) The mean loneliness score for all participants (N= 20) was $M=45.85$, $SD= 8.17$, with 50% of participants categorized as lonely based on published cutoffs, and 2) participants from formal garden sites had higher average loneliness scores compared to those from informal garden sites.

4.1.1 Demographic Description

A total of 20 community garden users/managers were interviewed. A total of 6 participants were interviewed from the formal community gardens sites (30%), with the remaining 14 from informal community garden sites (70%). A demographic description of the sample (N=20) is provided in Table 2.

Table 2. Demographic Characteristics

	Informal Gardens (N=14)	Formal Gardens (N=6)	City of Pomona
Age (yrs.)			
Mean (SD)	37.64 (14.3)	38.17 (12.7)	32.2
Range	20-75	26-55	-
	Percentage (N)	Percentage (N)	
Sex			
Male	42.9 (6)	33.3 (2)	49.41
Female	50 (7)	50 (3)	50.59
Non-Binary	7.1 (1)	16.7 (1)	-
Education			
Less than high school degree	7.1 (1)	0	17.67
Graduated High School or equivalent	0	16.7 (1)	23.6
Attended some college or trade school	50 (7)	33.3 (2)	21.1
Graduated college with a Bachelor's degree	35.7 (5)	50 (3)	13.3
Received a Graduate degree	7.1(1)	0	4.8
Race			
American Indian or Alaskan Native	0	33.3 (2)	2.4
Asian/Chinese/Japanese/Korean/Filipino	7.1 (1)	0	10.3

Black/African American	14.3 (2)	0	5.6
Hispanic/ Latina/o	57.1 (8)	50 (3)	71.7
White/Caucasian	7.1 (1)	0	10.8
Other	14.3(2)	16.7(1)	4.4
Marital Status			
Married	28.6 (4)	16.7 (1)	39.8
Living with a partner	14.3 (2)	16.7 (1)	-
Never Married	57.1 (8)	66.7 (4)	-
Employment Status			
Employed	50 (7)	50 (3)	59.3
Self-employed	21.4 (3)	0	-
Out of work and looking for work	7.1(1)	16.7 (1)	11.2
Out of work but not currently looking for work	0	16.7 (1)	-
Homemaker	7.1(1)	0	-
Student	7.1 (1)	16.7 (1)	-
Retired	7.1 (1)	0	-
Household Yearly Income			
Less than \$25,000	50 (7)	33.3 (2)	15.5
\$25,000-<\$50,000	28.6 (4)	16.7 (1)	31.3
\$50,001-<\$75,000	7.1 (1)	0	18.6
\$75,001-<\$100,000	7.1(1)	16.7 (1)	24
\$100,001-<\$150,000	0	16.7 (1)	13.5
Decline to respond	7.1 (1)	16.7 (1)	-
Role at the Garden			
Manager	35.7 (5)	33.3 (2)	-
User	64.3 (9)	66.7 (4)	-

Source for Pomona demographic information US Census Bureau, 2019; “-” indicates these data were not available.

4.1.2 Loneliness Findings

To examine how community garden users/managers rated their loneliness during the COVID-19 pandemic the UCLA Loneliness Scale-3 (Russel, 1996) was administered during the interviews. Given the scale’s rating from 20 to 80, with 20 indicating low loneliness and 80 indicating high loneliness, published findings suggest that scores ≥ 47 represent a higher-than-normal level of loneliness (Killgore, et al, 2020; Morahan-Martin and Schumacher, 2003). Descriptive statistics for garden site and loneliness scores are found in Table 3.

For all the participants (N= 20) the mean loneliness score was $M=45.85$, $SD= 8.17$, with 50% of participants categorized as lonely. For formal garden participants the average loneliness score was higher than the cutoff score of ≥ 47 ($M = 50$, $SD = 9.38$) indicating a higher-than-

normal level of loneliness for formal garden users. The mean loneliness score of informal garden participants $M=44.07$ ($SD=7.23$) was under the cutoff score. Given these findings I created the cases (i.e., informal and formal garden sites) that were to be further explored in the study. The distribution of the scores can be found in Table 4.

Table 3. Descriptive Statistics for Garden Site and Loneliness Scores

Site	N	Mean	Median	SD	Percentage of Garden Users Scoring Above the Cutoff (≥ 47)
Informal	14	44.07	45	7.23	42%
Formal	6	50	51.5	9.38	66%

Table 4. Descriptive Statistics and Distribution of Perceived Loneliness Scores

Loneliness Rating from 20 to 80	Informal Garden		Formal Garden	
	Mean (<i>SD</i>)	Range	Mean (<i>SD</i>)	Range
	44.07 (7.23)	33-59	50	39-60
Loneliness Rating Distribution	Percentage (N)		Percentage (N)	
33	7.1 (1)			
34	7.1 (1)			
37	7.1 (1)			
39	7.1 (1)		33.3 (2)	
40	7.1 (1)			
41	7.1 (1)			
44	7.1 (1)			
46	7.1 (1)			
47	14.3 (2)			
48	7.1 (1)			
49			16.7 (1)	
51	14.3 (2)			
54			16.7 (1)	
59	7.1 (1)		16.7 (1)	
60			16.7 (1)	

Note: Perceived loneliness rating questions were adapted to capture participant's perceived loneliness during COVID-19.

Table 5 denotes Pearson's correlation coefficients for loneliness scores with demographic variables. Loneliness ratings were not statistically correlated with sex, race, education, community

garden role, income, or employment status, indicating that loneliness did not vary by these social characteristics. However, a Pearson's r data analysis revealed a moderate negative correlation, ($r = -0.47$, $n=20$, $p < 0.05$) between age of community garden users/managers and loneliness score, such that as age increased loneliness scores decreased. There was also a strong negative correlation between informal garden site and perceived loneliness score ($r = -0.61$, $n=20$, $p < 0.01$). Lower loneliness scores were correlated with participation in informal garden sites. Lastly there was a moderate correlation between never married and loneliness scores ($r = 0.38$; $n=20$; $p < 0.05$) indicating that having never been married was correlated with increases in perceived loneliness scores.

Table 5. Correlation of Loneliness Rating with Demographic Variables

Variable		1	2	3	4	5	6	7	8	9
1. Loneliness Rating	Pearson Correlation	-								
	Sig 2-tailed									
2. Age	Pearson Correlation	-.472*	-							
	Sig 2-tailed	.036								
3. Female	Pearson Correlation	.031	.264	-						
	Sig 2-tailed	.895	.260							
4. Some College	Pearson Correlation	.245	-.196	.000	-					
	Sig 2-tailed	.298	.407	1.0						
5. Manager	Pearson Correlation	.080	-.123	-.105	-.314	-				
	Sig 2-tailed	.739	.604	.660	.177					
6. Never Married	Pearson Correlation	.382	-.413	.164	.290	-.171	-			
	Sig 2-tailed	.097	.070	.490	.216	.471				
7. Hispanic/Latino	Pearson Correlation	.172	-.112	.302	.101	-.179	-.123	-		
	Sig 2-tailed	.468	.637	.196	.673	.450	.605			
8. Employed	Pearson Correlation	-.195	.008	.000	-.200	.314	-.204	-.101	-	
	Sig 2-tailed	.411	.975	1.0	.398	.177	.388	.673		
9. Informal Garden Site	Pearson Correlation	.615**	-.031	.000	.000	.023	-.089	-.154	.000	-
	Sig 2-tailed	.004	.896	1.0	1.0	.924	.709	.518	1.0	
10. Income < \$25,000	Pearson Correlation	-.021	-.039	-.101	-.101	-.032	.123	.414	-.302	.154
	Sig 2-tailed	.931	.869	.673	.673	.895	.605	.069	.196	.518

Note: * Correlation is significant at the 0.05 level (1-tailed) ** Correlation is significant at the 0.01 level (2-tailed). The variables that had more than two categories (e.g., Race, income, education, and gender) were recoded into dichotomous categorical variables in order to run a Pearson's Correlation. In categories with 0.000 correlation participant data was evenly distributed.

4.2. Aim Two Key Findings: Community Gardener's Experiences

Three primary themes emerged from the theoretically focused (as opposed to open-ended) thematic analysis (Braun & Clarke, 2006; Saldaña, 2009): (a) individual wellbeing, (b) social wellbeing, and (c) governance and policy. Each of these themes has subthemes that are summarized in Table 6 and described in further detail below. Moreover, while the majority of participants

described several contributing factors to resilience, there were differences between informal garden users and formal garden users. An interesting finding is that for informal green spaces information sharing extended beyond the garden through social networks.

Table 6. Percentage of Participants that Mentioned Subthemes in their Interviews

Primary Themes	Subthemes	Percentages (N)	
		Informal	Formal
Individual Well-being	Stress reduction	100(14)	100(6)
	Connecting with local environment	57(8)	100(6)
	Physical activity in a natural setting	64(9)	100(6)
Community Well-being	Access to food	95(13)	16(1)
	Social Learning	92(13)	66(4)
	Social Capital	78(11)	100(6)
	User Diversity	92(13)	100(6)
	Information Sharing beyond the garden	85(12)	0
	Information sharing within the garden	78(11)	50(3)
Governance and Policy	Public safety	0	50(3)
	Partnership Diversity	42(6)	50(3)
	Self-organizing	57(8)	50(3)

4.2.1 Individual Well-being

The first theme that emerged, *individual well-being*, encompassed two subthemes that were found in both formal and informal garden sites: these include stress reduction, and connecting with local environment. However, the third subtheme of access to food was reported primarily by informal garden-site users (95%)—who also appeared to have lower incomes based on the descriptive statistics in Table 2. These differences are described further below.

The subtheme of stress reduction focused on engaging in community gardening to reduce or alleviate stress during the COVID-19 pandemic. *All* of the participants in this study described

that engagement in community gardens positively impacted their stress levels during the pandemic in both formal and informal garden sites. The following quotes exemplify *stress reduction*:

[Community gardening] really helped with my mental health during COVID because, you know, being in your room for eight hours working virtually not really good for anybody's sanity... for me to have that break... I could just go out there and just be on my knees with the soil, plants... really helped calm me down, my anxiety, my stress. (Informal Garden User Participant 16)

Oh, it helped me out a lot during COVID-19, because I was losing my mind. Especially in the beginning, I was just stressing about everything...the gardening, like it really, really, really came through for me, I think it kept me sane (Formal Garden User Participant 15)

Participants from both informal and formal garden sites referred to their community garden as a “sanctuary”—and as an essential respite from the challenges posed by COVID-19 (Participants, 1, 15). Contact with nature has been associated with improved mental wellbeing for participants in this study. When asked about how community gardening helped their stress levels, participants from informal and formal garden sites (57% and 100%, respectively) reflected on their ability to connect with their local environment.

That opportunity to connect with nature, I think definitely helps with my stress levels. And just like spending time outside, and like having the opportunity to share, somehow, some caring for Mother Earth, I think that also helps, just for my well-being overall. (Informal Garden User Participant 12)

It puts me in a position where I'm outdoors, digging being with nature being with other people, which is my happy place, so I find it very stress reducing. (Informal Garden User Participant 1)

Participants from both formal and informal garden sites described the opportunity the garden provided to engage in physical activity in a natural setting. When asked about how community gardening helped their stress levels participants from both informal and formal garden sites reflected on the garden's natural environment and its impact on their physical activity levels during the pandemic (64% and 100% respectively). Access to opportunities for physical activity during COVID-19 was particularly relevant as some participants from both informal and formal garden sites (Participants 17, 11, 5, & 12) mentioned that other options for physical activity were limited.

[To what extent has community gardening impacted your physical activity during COVID-19?] I would do like a little walk around the house. But for the most part, that [community garden] was the only place I would go to get active. (Informal Garden User ID 17)

There is a lot of physical work when creating and building a garden. It had a big impact on physical activity. (Formal Garden Site User ID 6)

For informal garden users (95%), the community gardens provided access to fresh and nutritious food during the pandemic. Their responses align with the literature that community gardens have been found to ameliorate pandemic-related economic losses by supplementing

community garden users' diets with nutrient-dense foods (Mejia, et al., 2020; Lal, 2020). The following quote exemplifies *access to food*:

I personally get food stamps. So, it took less out of that income that I was getting for my kids to provide more meat protein, you know, like I didn't have to worry about fruits and veggies because it was being provided by the garden. (Informal Garden User ID 7)

I'm more focused on [growing] edible food and things that I can use and bring into our home... You know, at the stores, there was a lot of shortages. I didn't want to be around people and [community gardening] gave me an opportunity to go directly from farm to table (Informal Garden User ID 3)

Although formal garden users did express that growing food was the natural next step for the garden, currently what is being grown is native plants, herbs, some greens, and cactus—some of which are edible and consumed by community garden users. However, most formal community garden members mentioned that the garden did not significantly contribute to their food supply during the pandemic (83%).

Not this garden... it hasn't produced anything yet. (Formal Garden User ID 5)

4.2.2 Community Well-being

A second overarching theme that emerged in both formal and informal garden sites was *community wellbeing*. Participants from both formal and informal sites reported that during COVID-19 the garden served as a place to create new social relationships and leverage existing

ones. The theme of Community wellbeing encompassed three subthemes that were present in both formal and informal gardens: 1) social learning/monitoring, 2) social capital, and 3) user diversity.

Community well-being can refer to various forms of social capital, public safety, access to food and open space, and opportunities to participate in meaningful activities (Chan, 2014; MEAP, 2005). This section will focus on community well-being as it relates to social capital. Social capital is defined as the resources that are rooted in social relationships (Chan, 2014). Community garden members from both informal and formal garden sites reported on the importance of the social relationships and the resources embedded within those relationships during their interviews (78% and 100% respectively).

One household actually had an outbreak of COVID in the house...we all get together to go grocery shopping for a couple of weeks that they generally kind of stepped in to provide aid and support as needed... COVID required us to be more available and I think, more helpful to each other. (Informal Garden User ID 13)

There were so many people involved to do it... she provided me with the contact, to get the bed seeds and the plant. He went all the way to LA, to assist us in making the [garden] beds. (Formal Garden User, ID 5)

Though the quantitative data demonstrated that informal garden sites were more ethnically diverse, participants in both formal and informal garden sites (92% and 100%, respectively) expressed that the gardens fostered bonding among homogenous groups and bridging among heterogeneous groups (Chan, 2014). The diversity at the garden sites extended beyond ethnicity. Some participants described the garden as being inclusive of the LGBTQ+

community and welcoming all ages. However, it is important to note an informal garden site user felt that initiatives to increase Black participation was needed.

Yeah, we are diverse... like some of my friends are like nonbinary or part of the LGBTQ plus community. So, like they're there, and stuff like that. So, it's really cool. (Informal Garden User- ID 14)

Oh, it's so diverse. I love that... It's like just, you know, not one specific race, culture, anything, you get a mesh of people. And like, it's cool, because I get to learn about them, they get to learn about me. But yeah, there's like a whole bunch of different people all the time. (Formal Garden User- ID 8)

Yeah, I think we would like to have more black people in the garden. But I'm not black. I think it's best to support just solidarity for other black organizations. (Informal Garden User- ID 11)

Formal and informal garden sites rely on the interconnections in social systems through a flow of information. I was specifically interested to better understand how COVID-19 disrupted the flow of information within these systems due to social distancing guidelines. Participants from both informal and formal garden sites (78% and 50% respectively) described information sharing continuity among members of the garden in both sites by adapting to alternative forms of communication (e.g., texting, social media).

It just changed the way we did it. So, you know, we would share a lot of our stories in person, and now we share in pictures. (Informal Garden User- ID 3)

I feel like it made us more resilient and innovative, in the way we connected, and the way I was able to share the information...instead of doing a public call out...I hit up people individually and forced me to think about some of the neighbors there that I knew. (Formal Garden User- ID 15)

Social and adaptive learning is a resource that was described by participants as being a key factor in the relationships formed in the garden. Chan (2014 p. 32) describes social learning as “the process of continued feedback and changes occurring between learners and their environment.” Many participants in both informal and formal garden sites (92% and 66% respectively) indicated community garden users stored experiential knowledge and passed on that knowledge at garden sites.

Definitely learned a lot there. Also, you know, I think it's played a role of supporting and teaching other people about things as well. (Informal Garden User- ID 13)

We have señoras...from the neighborhood, of color, and they have the experiential knowledge, like ancestral knowledge that they bring from their pueblos, their ranchos alright and they come here...They know certain plants they can identify them by just by looking at them like the señoras [are] teaching all of us. (Formal Garden User- ID 15)

For the formal garden users, much of the social capital building seemed to be only within garden borders, however informal garden users (85%) described social connections and exchanges outside of the garden that were initiated by their participation at the community garden. For informal garden users, information sharing transcended the garden, contributing to

the social learning of others. Participants reported that information about growing and storing food was particularly relevant during the pandemic, so much so that 85% of informal garden users shared what they learned outside the garden to others in their social network. Information stemming from the garden was shared with others irrespective of if they were active community garden users or not.

I did post a picture like on social media...I added how it [red leaf lettuce] stayed so crisp. So yeah, I shared it a few times and I've had questions asked [from friends]
(Informal Garden User- ID 7)

I would take those tips and spread it amongst my family. And that is also just as helpful, because, of course, our families interact with other families in the community. So, we'll spread those tips. (Informal Garden User- ID 9)

Community well-being can refer to public safety. Formal garden site participants (50%) reported the garden was intended to revitalize the park and to drive out criminal activity.

We had like testimony from individuals who said they did not want to go to that park because they felt unsafe...but since the garden has come in you know, in creating a community garden ...all of that stuff has contributed to an increase in park activity (Formal Garden User- ID 6)

At this park at this park Tony Cerda Park...I approached them when I see they are doing something wrong. And let them know that, that's not allowed here. And I approach them nicely, and ...I tell them because [there are] children and the elderly

people around to respect them, you know, and they should [be] considerate of others and pick up [their] trash (Formal Garden User- ID 10)

4.2.3 Governance and Policy

The final theme, *governance and policy*, refers to the ability of community garden users to engage in community garden governance and collaborate with organizations to mitigate the challenges posed by COVID-19. Within this theme, two subthemes emerged: self-organization and partnership diversity.

Both informal and formal garden sites are initiatives that depend on the democratic governance of the members. Formal garden sites emerged more recently during the pandemic, and as such they are beginning the process of transferring governance responsibilities to garden members. Both informal and formal garden participants (57% and 50% respectively) reported on the self-organizing happening at their garden sites with regards to collective decision making. The following quotes demonstrate self-organizing through the co-management and collective decision making at the garden.

We decided that we were going to create market boxes, which were basically a box of groceries. But we were going to fill them also with our fresh produce. And those would be delivered door to door, people who were in need. And we focused on families with children and the elderly... we've been doing that for over a year now, every Thursday morning. (Informal Garden User ID 1)

I think one of the things that, we had a longer discussion about was whether we should have vegetables there or not, because some, some people made the point that you know, it, you know, it's maybe it won't survive, maybe we won't take care of it. We compromise, we were like, Okay, so how about we do this? How about we only have one small, raised flower bed for vegetables? And everybody was cool with that. (Formal Garden User ID 15)

Yeah so, I would say it's, it's very democratic. Trying to think with other models of democratic but let's just go with democratic. It's very democratic. Kind of a horizontal leadership style, where everybody has a role and a say in what we're doing. (Informal Garden User-ID 1)

A key principle of social-ecological resilience is diversity in all forms--social, economic, biological, and landscape—as it enables systems more options to respond to a disturbance and embrace change (Chan, 2014; Walker and Salt, 2006). An integral subtheme of *governance and policy* was diverse partnerships. Participants from both informal and formal garden sites (42% and 50% respectively) described the impact of diverse partnerships from colleges, nonprofit organizations, and other institutes as a way of introducing diverse forms of knowledge and resources to help improve decision making and manage the garden (Chan, 2014). The following quotes depict diverse partnerships in the garden.

Yeah, I'm always looking for new collaborations, you know, whether it be individuals who are really interested in doing this work. Organizations like, you

know, Pomona Rotary who from the very beginning, saw our market box program and wanted to jump in and help (Informal Garden User- ID 1)

Because there were so many people involved to do it. You know, we had a Parks and Rec commissioners involved in order for us to try to get it passed for the city to go ahead and approve it. There was, you know, collaboration with the Eco farm with them...Home Depot coming in and giving a donation, right? On top of a pawn shop, for God's sake, they were able to produce this as well. Valley Vista, the trash company, they came in and assisted with soil, because we didn't have soil. So, they came in and got it through Amy's Farm. (ID 5 Formal Garden User)

4.3 Aim Three Findings

Aim three of this study was gain insight into the garden site characteristics that differentiate community garden sites. The participants from formal sites reported higher loneliness scores ($M = 50$, $SD = 9.38$), higher incomes, and less ethnic diversity of garden members (*See demographic table in Section 4.1.1*). Formal garden site participants reported that engagement in the garden helped reduce stress (100%), fostered social capital (100%), provided opportunities to connect to nature (100%), provided opportunities for physical activity in a natural setting (100%), and reported high levels of user diversity with regards to the age and gender identity of its members (100%).

The formal garden sites did not contribute to food access during the pandemic for the majority of formal garden participants interviewed in this study. Though growing food at these

sites was reported to be the natural next step, during the time period these interviews were conducted only herbs, cacti, and ornamental native plants were being grown.

At these garden sites, participants expressed that information sharing continued despite the disruption of the COVID-19 pandemic. Information was shared on scheduled beautification dates or volunteer events. Although all formal green-space users described meaningful social connections, they remained within the boundaries of the garden and were centered on volunteer events or independent stewardship of the site.

Informal garden site users had lower earnings, with 50% reporting a yearly household income less than \$25,000. Informal garden users also reported lower loneliness scores ($M=44.07$, $SD=7.2$), and higher ethnic diversity (*See demographic table in Section 4.1.1*). Informal garden site participants reported that engagement in the garden helped reduce stress (100%), fostered social capital (78%), provided opportunities to connect to nature (57%), provided opportunities for physical activity in a natural setting (64%), and reported greater levels of user diversity with regards to the ethnicity, and gender identity of its members (92%).

Two major distinctions arose that inform the practices that differentiate formal and informal gardens. The first is that the majority of informal garden users (95%) reported that the garden site helped with food access during the COVID-19 crisis compared to only 16% of formal garden users.

Secondly, qualitative data further revealed that a major component of the relationships and social interactions of informal garden sites were centered on growing food. Informal garden users (85%) reported that information about growing and storing food was particularly relevant during the pandemic so much so that they shared what they learned outside the garden to others in their social network. Although formal green-space users described meaningful social

connections, they remained within the boundaries of the garden and none of the formal garden users reported sharing that information with people outside of the formal garden network. In addition, sharing the harvest that was grown was described as a major factor for the social connection of informal garden-site users.

CHAPTER 5 DISCUSSION

5.1 Overview

Chapter Five outlines a summary of the study findings and recommendations. My study provides novel information about the application of SER frameworks with exploratory methodologies to outline the contribution of community gardens at different levels (e.g., individual, and community) of SER. With guidance from the recommendations and next steps discussed in this chapter, public health researchers, Pomona residents, and city stakeholders will be better placed to advance and improve the green-space landscape in the city of Pomona.

This research sought to answer two questions: “How do community gardens in Pomona contribute to SER during COVID-19?” and “To what extent are community garden users experiencing loneliness during COVID-19?” To answer the questions, the study achieved three aims: (1) assessed perceived loneliness of community garden users; (2) captured the experiences of community garden users during COVID-19; and (3) gained insight into the different garden characteristics that differentiate informal community garden sites and formal community garden sites. This study successfully accomplished the three aims, which resulted in added understanding of the role of community gardens during the COVID-19 pandemic in Pomona, California. Key findings from each aim are presented below alongside their contributions.

5.2. Study Findings and Contributions

Three key findings emerged from this exploratory multi-case study and are described further below: 1) garden site characteristics, specifically growing food, may be a key contributor to differences in loneliness scores between formal and informal gardens; 2) the civic ecology practices observed in the community gardens in Pomona suggest that these informal and formal community gardens support sources of SER from the individual to community level; and 3) this

study indicates the capacity for Pomona’s community gardens to provide a model for green infrastructure that fosters SER in the city.

5.2.1 Finding 1

The overall average loneliness score for study participants was $M=45.85$, $SD= 8.17$, $N=20$. On average informal garden users were less lonely ($M= 44.07$, $SD=7.23$), with 44% being considered lonely scoring above the cutoff for loneliness. By contrast formal garden users on average had higher loneliness scores ($M= 50$, $SD=9.38$), with 66% scoring above the cutoff for loneliness. Though both informal and formal garden sites served as “supportive institutions” they differed in the types of opportunities they provided to cope with the challenges posed by COVID-19 (Barthel et al., 2010; Bassett, 1979; Lawson, 2005: 301).

Garden site characteristics speak to the relationship between human culture and the environment and how one shapes the other in order to meet a need in urban landscapes (Francis and Hester, 1992). Informal gardens grew edible plants, while formal gardens grew native and ornamental plants at the time of the study. Informal garden users reported lower incomes and stressed the importance of the garden in supplementing their access to food during the pandemic. Although informal garden sites provided other opportunities to cope with the challenges posed by COVID-19, the majority of participants from informal garden sites (95%) reported that access to food was important to help them cope during the pandemic.

Qualitative data further revealed that a major component of the relationships and social interactions of informal garden sites were centered on growing food. Participants reported that information about growing and storing food was particularly relevant during the pandemic—so much so that 85% of informal garden users mentioned that they shared what they learned outside the garden to others in their social network. For informal garden users the dissemination of

knowledge that stemmed from the garden produced more opportunities for social connection with members of their network both within and outside of the boundaries of the garden.

Additionally, informal garden users described that sharing the harvest contributed to their social connection (Participants 17, 16, 7, 3, 9, 1, & 2), with 50% of informal garden users reporting sharing their harvest with friends and neighbors. Garden characteristics with regards to growing food may help explain the differences in loneliness scores because growing and sharing food might have prompted more opportunities for social connection both within and outside the garden boundaries. Though formal garden users described meaningful social connections, they remained within the boundaries of the garden and were centered on volunteer events or independent stewardship of the site.

5.2.1.1 Loneliness Findings

Unlike other social-ecological applications, this study focused on the social sphere, assessing loneliness to better understand the social connections embedded in systems. SER is an ecologically derived concept, and as such it has been critiqued for overlooking issues of human agency that informs social action (Chan, 2014; Mayer, 2017). This study addressed those deficiencies through the integration of interview questions and a loneliness assessment to provide insight on participants' individual experiences during the pandemic. Through this approach, community members shared their thoughts and experiences to emphasize a diversity of voices (Chan, 2014). This is especially important because research suggests that experiences of loneliness are diverse (Horigian et al., 2021).

Loneliness is not static; it is something that humans can go into and out of (Yanguas, et al., 2018; Anderson, 1993). Studies on loneliness during the COVID-19 pandemic have provided inconsistent results regarding the differences between subpopulations (Killgore et al. 2020;

Luchetti et al. 2020; Sutin, Luchetti, and Terracciano 2020). For example, a study out of Harvard Graduate School of Education suggested that young adults were the hardest hit by loneliness during the pandemic (Weissbourd et al., 2021). While another study published in the *Journal of Applied Gerontology*, suggested that seniors with chronic conditions were most vulnerable to the impacts of loneliness during the pandemic (Polenick et al., 2021).

There is also a lack of consensus on an appropriate cutoff for loneliness for the UCLA Loneliness Scale-3, especially during the pandemic (Kotwal, et al., 2020). A study published in *The Journal of Psychiatry Research* conducted during the third week of shelter-in-place orders included a nationally representative sample of 1,013 participants (18-35 years old). This study used the 20-item UCLA Loneliness Scale-3 (Russel, 1996) and found that the mean loneliness score was $M=43.8$, $SD= 13.5$. Forty-three percent of respondents exceeded the cutoff score for high loneliness (≥ 47) compared with a baseline of 38% reported in prior studies (Killgore, et al., 2020; Kovacs et al., 2021).

In a cross-sectional study conducted between April 22 and May 11, 2020, 1,008 participants ages 18-35 were recruited through social media. In this study, the mean score on the 20-item UCLA Loneliness Scale-3 (Russel, 1996) was 49.54 ($SD 7.9$), with 49% of the population reporting high loneliness with scores above 50 (Horigian et al., 2021).

In my study, loneliness was assessed from April 28, 2021 to May 13, 2021 over a year into the pandemic. The mean loneliness score for all participants in the study was $M=45.85$, $SD= 8.17$, with 50% of participants scoring above ≥ 47 indicating higher levels of loneliness. When I broke down the sample into cases the mean loneliness score of informal garden users ($N=14$) was $M=44.07$, $SD=7.23$, while 66% of formal garden users ($N=6$) reported loneliness scores ≥ 47 and had higher loneliness scores on average ($M = 50$, $SD = 9.38$).

Table 7. Comparative Studies Summary Table

Outcome	N	Scale and Loneliness Cutoff	Study Population	Timeline	Authors
Mean loneliness score was $M=43.8$, (SD 13.5), with 43% of respondents scored above the published cut off of ≥ 47	1,013	20-item UCLA Loneliness Scale, cutoff ≥ 47	U.S English speaking adults 18 – 35 years old	April 9-10, 2020	Killgore, et al., 2020
Mean loneliness score was $M=49.54$ (SD 7.9), with 49% of the respondents reporting scores above ≥ 50	1,008	20-item UCLA Loneliness Scale, cutoff ≥ 50	U.S. English speaking adults 18 – 35 years old	April 22 - May 11, 2020	Horigian et al., 2021
Mean loneliness score was $M=45.85$, ($SD=8.17$), with 50% of participants scoring above ≥ 47 and 30% scoring above ≥ 50	20	20-item UCLA Loneliness Scale, cutoff ≥ 47	Pomona residents speaking either English or Spanish over the age of 18	April 28 - May 13, 2021	Preciado, 2021

In my study the average loneliness scores for the entire sample seemed to align with the studies outlined in the table above. Informal garden users ($N=14$) reported lower loneliness scores on average $M=44.07$, $SD=7.23$, with 42% of informal garden users ($N=6$) scoring above ≥ 47 . The findings from this study suggests community gardens that are centered on growing food offer nature-based activities that prompt the social connectedness of its users despite the disruptions posed by COVID-19. While causation cannot be inferred from this data, the present findings are consistent with the notion that community gardens that grow food could play a role in the social connectedness of users in urban environments (Kingsley & Townsend, 2006).

Loneliness is not static, and it is important to continue to assess loneliness during the COVID-19 pandemic as shelter-at-home orders and safety recommendations continue to evolve.

5.2.2 Finding 2

The civic ecology practices observed in both informal and formal sites suggest that these community gardens support sources of SER from the individual to community level. Both informal and formal garden sites served as “supportive institutions” though they differed in the types of opportunities they provided to cope with the challenges posed by COVID-19 (Barthel et al., 2010; Bassett, 1979; Lawson, 2005: 301). The qualitative findings suggest that the gardens engender individual sources of SER by providing direct contact with nature, connecting with the local environment, providing opportunities for physical activity in a natural setting, and—for informal garden users—access to food.

Gardens play an important role in providing nature to urban dwellers (Maller et al., 2006). Contact with nature can reduce stress, as reported by participants (100%) in this study. Gardening provides a high level of engagement with nature, because of the physical interaction of activities like weeding, digging, and watering plants (Chan, 2014; Hale et, al., 2011). Access to nature and opportunities for physical activity were especially relevant to the participants in this study during COVID-19 as several reported that other opportunities to engage in physical activity were limited due to shelter-at-home guidelines (Participants 17, 14, 11, and 12). Living in the city, two participants referred to their garden as a “sanctuary” (Participants 1, and 15). Informal community garden sites also have the clear capacity to increase access to fresh food that contributes to the resilience of its users.

Gardens in this study contributed to SER at a community level as they fostered social capital, social learning, user diversity, and information sharing. Social capital is defined as the

resources that are rooted in social relationships (Chan, 2014). It plays an important role in resilience, as social networks and trust are valuable in assisting communities to collectively respond and adapt to disruptions (Folke, 2006; Putnam, 2000; Walker & Salt 2006). Community garden members from both informal and formal garden sites reported on the importance of the social relationships and the resources embedded within those relationships during their interviews (78% and 100%, respectively). These types of social resources have been identified as essential to the creation and preservation of livable urban places (Chan 104; Jacobs, 1961).

The findings in this study demonstrate the ability of community gardens to foster what Putnam (2000) has described as both bonding and bridging types of social capital (Chan, 2014). User diversity was a subtheme identified for both formal and informal garden sites (100% and 92% respectively). Bridging social capital is the development of social networks and engagement across social groups that are heterogenous, while bonding social capital is the development of social networks and engagement in homogenous social groups (Putnam, 2000). Nineteen of the gardeners in the study mentioned the diversity of garden members. Due to the social diversity in the informal garden sites studied, community gardening served as the basis for bridging forms of social capital, in terms of the sharing of resources and experiential knowledge across age, culture, and socio-economic backgrounds. This finding is aligned with Kingsley and Townsend (2006)'s findings that community gardens in Melbourne, Australia, cultivated social cohesion, social support, and social connections within the community garden community (Chan, 2014).

Seven of the gardeners spoke about the involvement of children and families at the gardens. Two mentioned the diversity of gender identifies and inclusion of LGBTQ+ individuals at their garden site. In the formal garden spaces, Latino/as that lived in the surrounding

neighborhoods engaged in meaningful experiences together. This type of social bonding has proven to be essential in developing trust and collective strength (Chan, 2014; Panth,2010)

For community gardeners in this study social support was developed through the sharing and exchange of garden-related information and resources despite the disruption to face-to-face interaction posed by the COVID-19 crisis. Community garden members from both formal and informal garden sites adapted their communication methods to continue to provide social support during the pandemic. For formal garden users, the exchange of information stayed within the boundaries of the garden. However, for informal garden users the information exchange of garden-related information transcended the boundaries of the garden, with 85% reporting that they shared information that they learned with family and friends outside the garden.

In addition to being socially functional and meaningful community-led places, community gardens in this study presented opportunities for social learning. Social and adaptive learning is a resource that was described as a key factor in the relationships formed in the garden. Chan (2014 p. 32) describes social learning as “the process of continued feedback and changes occurring between learners and their environment.” Many participants in both informal and formal garden sites (92% and 66%, respectively) indicated that community garden users stored experiential knowledge and shared that knowledge at garden sites. From a social-ecological systems perspective learning is essential. It enables individuals to respond more effectively to feedback by gaining knowledge and adapting practices based on that knowledge (Berkes et al., 2003; Carpenter et al., 2001; Folke et al., 2003; Krasny & Tidball, 2012). Learning is key to building resilience in social-ecological systems by encouraging adaptability (Walker et al., 2004).

Lastly, governance and policy pertain to the participation in community garden governance and to collaborations with organizations. Similar to Chan's (2014) study, all of the community gardens in this study had collaborations with organizations outside of the garden. Lopez Urban Farm for example had connections with the Pomona Rotary Club and the formal garden site Cesar Chavez Park had connections with a local pawn shop that helped raise the money to start the garden.

Diverse partnerships with groups outside of the community garden create overlaps in support which has been shown to create more resilient systems (Krasny & Tidball, 2012; Ostrom, 2010; Walker & Salt, 2006). Additionally, the collaboration with outside groups or organizations creates opportunities for learning, sharing, and integrating knowledge as well as scaling up local outcomes (Chan, 2014; Krasny and Tidball 2012).

Self-organization is a key principle in the resilience of complex adaptive systems because it allows a system to act, re-organize, and adapt to change (Chan, 2014; Folke 2006). The community gardens explored in this study are initiatives that are entirely organized and democratically governed by members of the garden (Chan, 2014). Initiatives that are most sustainable are to some level grass roots and organized within the community (Chan, 2014; Jacobs, 1961). The majority of participants in this study (55%) mentioned information on collective decision-making processes in their garden site.

The civic ecology practices observed in both informal and formal sites suggest that these community gardens support sources of SER from the individual to community level. These findings are in line with the ones identified by Krasny et al. (2014) and Chan (2014), with the addition of an added emphasis on the differences between informal and formal gardens. Although this study focused on the social sphere of the Civic Ecology Model (Krasny and

Tidball, 2012), the beneficial link between humans and nature are reflected in the responses provided by participants.

5.2.3 Finding 3

For a variety of reasons, there is a need to increase access to urban green space for the Pomona community, including EJ issues. As Pomona grows in density and demographic diversity, ensuring appropriate access to green space will remain an increasingly important issue. Given that Pomona residents deal with both higher exposures to pollution and other factors that make them more vulnerable to pollution burden there is a need to increase green space access to improve city-wide urban air quality (OEHHA, 2021; EPA, 2021). Though, additional research is needed to examine if community gardens could be a “just green enough” urban greening strategy that explicitly protect social as well as ecological sustainability (Wolch et al., 2004 p 234).

The civic ecology practices observed in the community gardens in Pomona suggest that these informal and formal community gardens support sources of SER from the individual to community level. As human encroachment into natural habitats and climate change threaten to increase the occurrence of future pandemics, improvements in public health crisis preparedness, response, and adaptation processes in urban environments are needed (Sharifi & Khavarian-Garmsir, 2020; Connolly et al., 2020). Community gardens can contribute to urban design strategies to increase social-ecological resilience (Chan, 2014). This study indicates the capacity for Pomona’s community gardens to provide a model for green infrastructure that fosters SER in the city. Consistent with the literature, the community gardens in this study helped foster and strengthen social interactions, relieve stress, and build or leverage social capital needed when disaster strikes (Chan, 2014; Shimp et al., 2019). Therefore, planning and establishing community gardens prior to the next disaster would help with SER.

5.3 Recommendations

Future research on gardening and its effects on loneliness may be warranted as this study's findings align with past research suggesting that gardening may significantly increase social contacts and less loneliness among garden users (van den Berg, et al., 2010). Both formal and informal garden sites in this study played an important role in bolstering the ability of participants to respond, adapt, and self-organize in the face of the disturbance posed by the COVID-19 pandemic. Therefore, proactive planning and establishing of community gardens prior to a disaster would help by incorporating resilience fostering green infrastructure in the city.

However, informal garden sites are transitional in nature (Chan, 2014; Shimpo et al., 2019). Issues with regard to the land tenure of these sites and insufficient funding pose frequent barriers to the longevity of these spaces (Kamper et al., 2018). If we aim to improve green space access, create healthier, greener, and more resilient cities, community gardens might be considered as long-term assets that require long-term tenure security reinforced by urban planning policies (Shimpo et al., 2019).

Implementing strategies that advance equitable access to green space is especially important now as cities are reevaluating their relationship with nature in the wake of COVID-19 and other pressing environmental challenges (The Trust for Public Land, 2020). This study aimed to provide stakeholders in the City of Pomona with knowledge about the contribution of community gardens to social-ecological resilience during COVID-19, but the aim was to take it a step further by utilizing knowledge gained from this study to advance the city's approach to green space throughout the city. There are two key recommendations for City of Pomona leaders: 1) foster the growth of new

informal garden sites through flexible zoning for urban agriculture, and 2) promote the use and creation of both formal and informal community gardens *that include food-growing* throughout the city as a part of the Healthy Eating Active Living Resolution passed by the City of Pomona in 2012.

During the interviews for this study formal garden users mentioned the process they undertook to create a community garden in a city park—though currently there is no information describing the process on the Pomona City website, suggesting the need for a standardized policy.

The City of Pomona could learn much from the City of Minneapolis that has nearly 200 community gardens to promote access to good nutrition, improve their ecological system, and encourage healthy spaces for community building (Minneapolis Community Gardens, 2021). They facilitated the creation of community gardens on informal green space through flexible zoning, enabling community gardens to operate on residential, office residence, commercial, downtown, or industrial zones (Zoning and Urban Agriculture, 2021). By remaining flexible in their zoning for urban agriculture and leasing vacant city-owned lots through their Minneapolis Garden Lease Program they have leased 60 gardens on vacant land significantly increasing the green-space landscape in the city in a way that this study indicates enhances community resilience.

The City of Minneapolis' Community Garden Policy (Minneapolis Park and Recreation Board, 2021) indicates that community gardens should be created where appropriate including in neighborhood parks in order to support urban agriculture and make it available to all Minneapolis residents free of charge. The policy designates that community gardens should be sought in underutilized sections of the park that will not

interfere with existing park uses or aesthetics. The policy was designed to renew and develop park facilities that foster urban agricultural activities. In an effort to encourage diverse participation the Minneapolis Park and Recreation Board published the policy and all promotional materials in multiple languages.

As demonstrated in Minneapolis, governments are in a unique position to either encourage gardening activities through the development of policies that support and prioritize garden development for socially or financially vulnerable populations or promote the use of existing gardens (NCSL, 2021). The issue of promotion is a vital one as cities with community gardens tend to promote them as assets to increase green-space utilization for their residents. Especially for formal gardens, that are on formal park land, the promotion of these places by the city of Pomona could increase their utilization and overall discovery. One example of how this might be done, is the City of Atlanta that includes information on community gardens and information about how to get involved on their city's website (City of Atlanta, 2020). This is especially relevant as *all* of the participants in this study mentioned that they heard about the garden through social media or word of mouth.

The potential groundwork for community garden policies to be implemented in the City of Pomona has already been laid. In 2012, Pomona passed a Healthy Eating Active Living (HEAL) resolution recognizing the important role of community factors on obesity prevention and health. The HEAL resolution calls for the City of Pomona to improve physical activity and food environments through land use and the built environment. Community gardens fall within the purview of the HEAL resolution, as such should be considered a civic priority to improve the health and wellness of the

community. This research will provide a platform for community garden users to advance the development of informal green spaces throughout the city. The intent is to provide the results of this study to city stakeholders to advocate for community gardens as a civic priority in the City of Pomona, California to advance equitable access to green space.

5.4 Next Steps

Several action items will help the utilization of this research. First, the findings of this research will be disseminated among community garden leaders in Pomona. The community garden leaders will provide feedback on the findings and it is expected that they will help champion the study's recommendations to the City of Pomona's Park and Recreation Department. The champions and other key stakeholders throughout Pomona, including Pomona's Promise collective impact group, will be informed of how the findings align with the HEAL resolution passed in the City in 2012.

Additionally, the City of Pomona is undertaking consideration of an EJ element to include in the General Plan in early 2022. As a Park and Green Space Commissioner, I will work with city staff to ensure that this research and its recommendations are considered in the development of the EJ component to be included in the general plan. In particular, this research emphasizes the importance of green space landscape to EJ considerations, and also provides information on what types of *green* spaces are important to consider in the City of Pomona.

Over time, I hope this study helps increase and enhance the green-space landscape in the city of Pomona, and also the fairness of its distribution. Transdisciplinary research,

such as this, enables health and equity to be more widely considered by those outside the health sector, and, over the long-term, can improve community health in a meaningful way through urban planning.

Findings based on the cases explored in this study are not representative. This study is exploratory and used small intentional samples and therefore its findings are not generalizable. Despite the limitation of this exploratory study, which drew from a limited number of participants and community gardens, the depth and richness of the qualitative data indicates that community gardening is an example of civic ecology practices in Pomona which contributes to SER by supporting community and individual welling.

5.5 Conclusion

This dissertation examined social-ecological resilience literature and applied exploratory methodologies to understand the resilience role of community gardens in the City of Pomona during the pandemic. Using previous findings from an environmental assessment (Preciado, 2019), and the application of the Conceptual Model of Civic Ecology, this study produced findings regarding the contribution of community gardens to social-ecological resilience during the Covid-19 pandemic and synthesized information about Pomona's green-space context. By proposing recommendations to the City of Pomona's Parks and Recreation department, it is more likely that green-space access will be improved in the city with stronger processes and policies centered on resilience and inclusion. It is my sincere hope that my research will advance EJ and public health by advancing the green-space landscape for Pomona residents.

DrPH Competencies

Data & Analysis

1. Apply qualitative and quantitative, mixed methods and policy analysis research approaches and evaluation methods to address health issues at the multiple (individual, group, organization, community and population) levels
2. Explain the use and limitations of surveillance systems and national surveys in providing data to assess population health needs, monitor the implementation of interventions to address them and evaluate outcomes and impact of programs and policies

Leadership, Management & Governance

1. Build capacity and strategies for health improvement and elimination of health inequities by organizing stakeholders, including researchers, practitioners, community leaders and partners
2. Influence behavior and policies by communicating public health science to diverse stakeholders, including individuals at all levels of health literacy.
3. Integrate knowledge, approaches, methods, values and potential contributions from multiple professions and systems in addressing public health problems
4. Create and implement strategic plans
5. Facilitate shared decision making through negotiation and consensus-building methods
6. Create and sustain organizational change strategies
7. Promote equity within public health programs, policies and systems
8. Assess one's own strengths and weaknesses in leadership capacities including cultural proficiency
9. Acquire and align human, fiscal and other resources to achieve strategic goals
10. Cultivate new resources and revenue streams to achieve strategic goals

Programs

1. Design system-level interventions that influence population health outcomes in transdisciplinary team approaches that promote health equity and disease prevention
2. Integrate knowledge of cultural values and practices in the design or implementation of public health programs

Policy

1. Integrate scientific information, legal and regulatory approaches, ethical frameworks and varied stakeholder interests in policy development and analysis

Education & Workforce Development

1. Assess a population's knowledge and learning needs
2. Deliver training or educational experiences that promote learning in academic, organizational and community settings
3. Use best practice modalities in pedagogical practices

APPENDIX A

Information on the 2019 Environmental Assessment

To better understand the green space landscape in Pomona I conducted an environmental assessment in September 2019. This study used Geographic Information Systems (GIS) and observational data to explore green-space utilization in the City of Pomona. Survey123, an ArcGIS software application, was used to collect data in the field. Data collectors were instructed to download the application on their phones and trained in its use. For safety purposes data collectors were told to only go out to the field in pairs. In researching the City of Pomona and identifying our points of interest we reviewed the General Plan in which all formal green spaces are mapped (City of Pomona 2014 General Plan Update). For formal urban green spaces, a total of 3 assessments were conducted at each park between September 16, 2019 through September 28, 2019. To take into account time differences, each park was assessed once in the morning (8:30am-10:30 am), evening (3:30-7:30 pm), and on a weekend either Saturday or Sunday (between the hours of 8:30 am- 3:30 pm). Data collectors worked in pairs to assess the parks. Once arriving at the parks, they separated to independently collect observational data of park space utilization and photograph park space use. Upon completing their assessment, the two data collectors debriefed to reconcile any discrepancies between their findings. Data collectors were trained to observe park user characteristics such as age or whether park users were observed to be transients. The subgroups of interest were infants (1-11 months), young children (1-5), children (6-10), adolescents (11-17), adults (18-64), seniors (65+), and transients.

During the first two assessments the data team encountered some technical difficulties using the application Survey123 while out on the field. So as to not bring attention to themselves they continued to collect observational data with pen and paper. Once the information was gathered

and the data collectors debriefed on their findings the information was then input into the web-based application Survey123.

The data collection procedures for Informal Green Spaces (IGS) were adapted to take into account the transitional nature of IGS and their more-private settings. For example, IGS can be located on small church parking lots or other small settings in which people have an established social network, therefore our ability to go unnoticed was difficult. For IGS, we were mainly interested in documenting the existence of actively utilized informal open spaces in the community. Informal open spaces were identified with the help of a collective impact group in the City of Pomona entitled Pomona's Promise. Data collectors went to each specified location between September 2019 and October 2019. With the permission of those using the space, data collectors photographed the area and geocoded the location on Survey123. Due to the transitional nature and more intimate use of informal green space we understand that a major limitation from this assessment is the possibility we were not able to capture all the informal green spaces in the city. With that understood, we still think the data capture is relevant because it provides us with some information about the type of informal green spaces that have emerged in the city and the needs they aim to address.

Urban park and recreation agencies frequently find themselves in the forefront of the complex issue of homelessness in their communities due to the increased presence of transient individuals on public park land (National Recreation and Park Association, 2017). Parks and recreation agencies have had a byzantine relationship with the transient populations they serve (NRPA, 2017). One perspective is that public parks are considered a community resource, providing valuable benefits to all people (NRPA, 2017). Another is that the prevalence of transient individuals on public park land put undesirable pressure on the finite resources of park and

recreation agencies (NRPA, 2017) and may discourage other users. The circumstances of transient populations and the challenges and opportunities they pose vary city by city (NRPA, 2017). Despite the active use of resources by transient populations, parks and recreation agencies do not typically lead their cities' efforts to address homelessness and in some cases do not participate at all in multiagency efforts that address homelessness (NRPA, 2017).

The U.S. Department of Housing and Urban Development's (HUD's) HUD Exchange tools informed our process of collecting point-in-time data within a geographic area (US Department of Housing and Urban Development, 2020). Important to note is that the point-in-time data collected by Continuum of Care programs and other HUD community partners are typically done at night, therefore our observational surveys were modified to fit the time and resources available for this exploratory phase of the study. As such, individuals were not disturbed during the process of our data collection. Photographs and notes were taken describing their location and behavior in an effort to not duplicate counts. Individuals were considered transients if they met HUD's criteria of settling in a place not intended for human habitation (e.g., tent, park bench, etc.) (HUD PIT Observation Tool, 2020) and/or met the observational criteria of having belongings with them (e.g., blankets, shopping carts, etc.), had weathered clothing, and appeared as if they had been exposed to the elements. In an effort to avoid observer bias two data collectors were used to conduct the assessment. At the end of each assessment data collectors debriefed to ensure that there was consensus regarding how individuals were identified in the study. This study was not meant to and cannot provide an estimate or accurately reflect the transient population for all parks at any given time. Instead, it provides an estimate of the transient population at one park space at one given time as this data cannot be aggregated (we have no way of knowing if transient users move between parks). The impetus for generating this data was to provide insight on park

activation and users for further exploration and research question development, as well as ensuring that we shed light on all park users within our community to help the City of Pomona identify opportunities for outreach.

According to the Institute of Medicine committee on Health Care for Homeless People (1988), counting the homeless population is extremely difficult for several reasons and each method created to take on this endeavor, although beneficial, has technical inadequacies that must be mentioned. The technique used in this study provides a view of the transient population at a park in a single point in time. There are two primary disadvantages to this method (Institutes of Medicine, 1988). The first is that the constant state of flux in a park makes the count out of date almost immediately after it is taken (Institutes of Medicine, 1988). In this case, each park was assessed three times. At the time of the assessment there were 27 parks in the city of Pomona. Each park, depending on the size, took approximately 15 minutes to 35 minutes to walk through and assess.

Data collected from the three independent assessments were used to create density maps of formal green space and presented to the Community Services, Parks and Recreation, and Pomona city officials. Considerations needed to be taken with regard to how some park users were classified, specifically those who were in park space but were in their cars at the time of the assessment. To ensure we do not provide misleading information we created a separate category for those who recreated in their cars at the time of the assessment.

A total of 31 maps were created and presented during my practicum. I was able to identify trends such as that parks in the south of Pomona were more activated at the time of the assessments, formal green spaces that had outdoor programming (e.g., little league, soccer leagues, etc.) had more activation, and an inverse relationship between uses by specific subgroups, such that as transient

green space use increased, park use by other subgroups (e.g., infants, young children, adolescents, adults, and seniors) decreased. In addition, we were able to identify 10 actively used informal open space locations in the city of Pomona as well as empty lots throughout the city. The figures that were included in this study were generated as visual representations of the data we found in the field. ⁶

⁶ Practicum presentation was given at the Offices of the School of Community and Global Health on November 26, 2019.

APPENDIX B

Kransy and Tidball's (2012) model provides a structure that identifies the origins, process, and outcomes of resilience of civic ecology applications. These practices emerge in response to disturbances and draw on social-ecological memories (Kransy and Tidball, 2012).



Figure 10. Conceptual Model for Civic Ecology Kransy and Tidball (2012)

APPENDIX C



AGREEMENT TO PARTICIPATE IN COMMUNITY GARDENS RESEARCH STUDY (IRB #3982)

You are invited to be interviewed via telephone for a research project to learn about the role of community gardens before and during COVID-19 and how the pandemic has affected your connections to other people. If you agree to participate, you will be asked questions about your personal experiences using community gardens in the City of Pomona. The telephone interview will take about 45 minutes. You can decide whether or not to take part in the research. You may also withdraw from the study at any time for any reason. If you decide to participate in the study, you will receive a \$30.00 gift card to Home Depot for your time. Please continue reading for more information about the study.

STUDY LEADERSHIP: You are being asked to take part in research activities in the form of a key informant interview led by Juanita Preciado, a doctoral student at Claremont Graduate University who is being supervised by Paula Palmer, PhD Associate Professor and Director of Global Health Programs at Claremont Graduate University.

PURPOSE: This study was designed to assess the role of community gardens before and during COVID-19 and how the pandemic has affected your connections to other people.

ELIGIBILITY: To be in this study, you must be 18 or over, have access to a telephone, fluent in either English or Spanish, a resident of Pomona, and an active community garden user/ manager between January 2020 to present.

PARTICIPATION: During the study, you will be asked questions about your experiences in community gardens before and during COVID-19 and how you have felt during COVID-19. For example, "To what extent has community gardening impacted your physical activity during COVID-19?" and "Pre-COVID what did you do during a typical day in the garden? How has COVID-19 changed a typical day in the garden for you?" You will also be asked to complete a pre-survey that will take between 4 to 6 minutes.

RISKS OF PARTICIPATION: The risks that you run by taking part in this study are minimal. The minimal risks include possible distress disclosing your experience with COVID-19 and how it relates to your community garden experience.

While this type of research is considered low risk, there is always the possibility you might feel embarrassed or some discomfort when answering a particular question. For that reason, it is important to remember that you have the right to refuse to answer any of the questions in the survey or during the interview. In the survey, participants can simply skip a question. During the interview, you can simply state you do not wish to respond to the question. You can also stop the interview or quit the survey at any time.

BENEFITS OF PARTICIPATION: I do not expect the study to benefit you personally. This study will benefit the researcher by facilitating the completion of graduate school.



COMPENSATION: You will be directly compensated with a \$30.00 gift card to Home Depot for your time. The gift card will be mailed to you at the end of the interview. We will send you a copy of this consent form along with your \$30.00 gift card upon completion of the survey and interview.

VOLUNTARY PARTICIPATION: Your participation in this study is completely voluntary. You may stop or withdraw from the study at any time or refuse to answer any particular question for any reason without it being held against you. Your decision whether or not to participate will have no effect on your current or future connection with anyone at Claremont Graduate University.

CONFIDENTIALITY: Survey responses will be kept confidential. During the interview, we will not refer to you by name to protect your privacy. Your responses will be linked to a protected identification number, but your name and any identifiable information that could be used to link your answers to your identity will not be used. Only research staff will have access to your responses. Individual responses will be presented in summary form, including in reports, papers, books, or presentations resulting from this study. The survey, audio recording of your interview, written transcript of your interview, this consent form, and anything else that might link your name to the study will be kept password protected, locked and secured by our research staff. Your recorded interview will be erased once it's transcribed. Your information will be destroyed after 5 years following publication of this research.

SPONSORSHIP: This study is made possible by a Community Wellness Grant from City of Hope.

FURTHER INFORMATION: If you have any questions or would like additional information about this study, please contact Juanita Preciado at juanita.preciado@cgu.edu. You may also contact Dr. Paula Palmer, faculty supervisor at 909-650-1075 or paula.palmer@cgu.edu. The CGU Institutional Review Board has certified this project as exempt. If you have any ethical concerns about this project or about your rights as a human subject in research, you may contact the CGU IRB at (909) 607-9406 or at irb@cgu.edu. We will send you a copy of this consent form along with your \$30.00 gift card upon completion of the survey and interview.

CONSENT: If you understand the information provided, and someone has answered all the questions you may have had about the study, and you voluntarily agree to participate in it say yes.

Participant Consent Yes No

Date _____

Printed Name of Participant _____



APPENDIX D

Participant ID Code:

Date of Interview:

Time interview began:

Time interview ended:

1. What community garden do you go to?
2. What is your birth year?

3. How would you describe yourself?
 - a. Male
 - b. Female
 - c. Transgender
 - d. Do not identify as female, male or transgender
 - e. Decline to respond
4. Please tell me which one or more of the following you would use to describe yourself.
(Circle all that apply)
 - a. American Indian or Alaskan Native
 - b. Asian/Chinese/Japanese/Korean/Filipino
 - c. Black/African American
 - d. Hispanic/Latino
 - e. White/Caucasian
 - f. Native Hawaiian or Other Pacific Islander
 - g. Middle Eastern
 - h. Other
 - i. Do Not Know
 - j. Decline to respond
5. What is your current marital status?
 - a. Married
 - b. Living with a partner
 - c. Widowed
 - d. Divorced
 - e. Separated
 - f. Never married
 - g. Decline to respond
6. What is your current employment status?
 - a. Employed
 - b. Self-employed
 - c. Out of work and looking for work

- d. Out of work but not currently looking for work
 - e. A homemaker
 - f. A student
 - g. Military
 - h. Retired
 - i. Unable to work
 - j. Decline to respond
7. What is your highest level of education?
- a. Less than high school degree
 - b. Graduated High School or equivalent
 - c. Attended college or trade school
 - d. Graduated college with an Associate Degree
 - e. Graduated college with a bachelor's degree (BA/BS)
 - f. Received a Graduate degree (Master's, PhD, MD, JD)
 - g. Decline to respond
8. How many people are currently living in your household, including yourself? ____
- a. Of these people, how many are less than 18 years old? ____
9. Which of these categories best describes your total combined family income for your household for the past 12 months? This should include income (before taxes) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.
- a. less than \$25,000 (1)
 - b. \$25,000-<\$50,000 (2)
 - c. \$50,001-<\$75,000 (3)
 - d. \$75,001-<\$100,000 (4)
 - e. \$100,001-<\$150,000 (5)
 - f. more than \$150,000 (6)
 - g. Don't Know/Not sure (77)
 - h. Decline to respond (-9)
10. To what extent has community gardening impacted your physical activity during COVID-19?
11. In your opinion how has community gardening impacted your stress during the time of COVID-19?
12. Has community gardening helped supplement your food supply during the pandemic? If so how?
13. Pre-COVID what did you do during a typical day in the garden? How has COVID-19 changed a typical day in the garden for you?
14. Prior to COVID-19 tell me about the interactions you had with other people in the garden.

15. How has COVID-19 changed the interactions you have with other people in the garden?
16. Do you share your strategies or tips with other community garden users here, especially those that might not have as much experience in gardening?
17. Have you learned any tips or strategies from other gardeners here?
18. How has COVID-19 impacted your ability to share information with other members?
19. In your opinion how socially diverse is this garden (Chan, 2014)? Are there any initiatives or efforts to increase the social/cultural diversity in the garden?
20. How has COVID-19 impacted interest in joining the garden?
21. Prior to COVID-19 was this garden actively engaged in collaborations with government agencies, nonprofits, or colleges?
22. How has COVID-19 impacted the partnerships with other groups?
23. During COVID-19 how has access to the community garden affected you? Your family? Your community (Chan, 2014)?
24. How are decisions made in this garden?
25. How does someone join this garden?
26. How Long have you been gardening at (_____)?

Instructions: The following statements describe how people sometimes feel. For each statement, please indicate how often you feel the way. Here is an example:

How often do you feel happy?

If you never felt happy, you would respond “never”; if you always feel happy, you would respond “always.”

1. During COVID-19 how often do you feel that you are “in tune” with the people around you?

Never Rarely Sometimes Always

2. During COVID-19 how often do you feel that you lack companionship?

Never Rarely Sometimes Always

3. During COVID-19 how often do you feel that there is no one you can turn to?

Never Rarely Sometimes Always

4. During COVID-19 how often do you feel alone?

Never Rarely Sometimes Always

5. During COVID-19 how often do you feel part of a group of friends?

Never Rarely Sometimes Always

6. During COVID-19 how often do you feel that you have a lot in common with the people around you?

Never Rarely Sometimes Always

7. During COVID-19 how often do you feel that you are no longer close to anyone?

Never Rarely Sometimes Always

8. During COVID-19 how often do you feel that your interests and ideas are not shared by those around you?

Never Rarely Sometimes Always

9. During COVID-19 how often do you feel outgoing and friendly?

Never Rarely Sometimes Always

10. During COVID-19 how often do you feel close to people?

Never Rarely Sometimes Always

11. During COVID-19 how often do you feel left out?

Never Rarely Sometimes Always

12. During COVID-19 how often do you feel that your relationships with others are not meaningful?

Never Rarely Sometimes Always

13. During COVID-19 how often do you feel that no one really knows you well?

Never Rarely Sometimes Always

14. During COVID-19 how often do you feel isolated from others?

Never Rarely Sometimes Always

15. During COVID-19 how often do you feel that you can find companionship when you want it?

Never Rarely Sometimes Always

16. During COVID-19 how often do you feel that there are people who really understand you?

Never Rarely Sometimes Always

17. During COVID-19 how often do you feel shy?

Never Rarely Sometimes Always

18. During COVID-19 how often do you feel that people are around you but not with you?

Never Rarely Sometimes Always

19. During COVID-19 how often do you feel that there are people you can talk to?

Never Rarely Sometimes Always

20. During COVID-19 how often do you feel that there are people you can turn to?

Never Rarely Sometimes Always

27. Is there anything else you would like to tell me about your experience here (Chan, 2014)?

REFERENCES

- ACGA. (2014). American Community Gardening Association: FAQ. American Community Garden Association. <https://communitygarden.org/resources/faq/>
- Andersson, L. (1993). Loneliness and its Relationship with Misery. *Psychological Reports*, 73(2), 584–586. <https://doi.org/10.2466/pr0.1993.73.2.584>
- Astell-Burt, T., Hartig, T., Eckermann, S., Nieuwenhuijsen, M., McMunn, A., Frumkin, H., & Feng, X. (2021). More green, less lonely? A longitudinal cohort study. *International journal of epidemiology*, dyab089. Advance online publication. <https://doi.org/10.1093/ije/dyab089>
- Aronson, R. A. (2014). Eating in crisis: Culturally appropriate food and the local food movement in the lives of domestic violence survivors. University of Vermont, Burlington, Vermont. Retrieved from <https://scholarworks.uvm.edu/hcoltheses/21>
- Armitage D., Berkes, F., Doubleday, N. (Eds). 2007. Adaptive co-management: collaboration, learning, and multi-level governance. Vancouver, Canada: University of British Columbia Press.
- Barthel, S., & Isendahl, C. (2013). Urban gardens, agriculture, and water management: Sources of resilience for long-term food security in cities. *Ecological Economics*, 86, 224–234. doi:10.1016/j.ecolecon.2012.06.018
- Barthel, S., Parker, J. & Ernstson, H. (2013). Food and Green Space in Cities: A Resilience Lens on Gardens and Urban Environmental Movements. *Urban Studies*.
- Bedimo-Rung, A., Mowen, A. J., & Cohen, D. A. (2005). The significance of parks to physical activity and public health. *American Journal of Preventative Medicine*, 28, 159–168. doi:10.1177/0042098012472744
- Berkes, F., Colding, J., Folke, C. (2003). Navigating Social-Ecological Systems: Building Resilience for Complexity and Change. Cambridge University Press, Cambridge.
- Berry, M. M. (2012). Thinking Like a City: Grounding Social-Ecological Resilience in and Urban Land Ethic. *Idaho Law Review*, 50(2), 117-151.
- Bloomberg, L.D., and M.F. Volpe. 2012. Completing Your Qualitative Dissertation: A Road Map. From Beginning to End. Second Edition. Thousand Oaks, Calif: SAGE Publications, Inc.
- Bluestone, B., Stevenson, M., H. and Williams, R. (2008). The Urban Experience Economics, Society, and Public Policy. Oxford.
- Boone, C., Buckley, G., Grove, J., & Sister, C. (2009). Parks and people: An environmental justice inquiry in Baltimore, Maryland. *Annals of the Association of American Geographers*, 99(4), 767–787.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Bureau of Labor Statistics (2020). Pomona unemployment rate. Retrieved from: https://ycharts.com/indicators/pomona_ca_unemployment_rate#:~:text=Pomona%2C%20CA%20Unemployment%20Rate%20is,long%20term%20average%20of%208.75%25.
- CalEPA. (2018). Environmental Task Force Pomona Initiative Report. Retrieved from: <https://www.arcgis.com/apps/Cascade/index.html?appid=3c70b0d713b940b9b508e172996da95a>
- California Department of Public Health (2020). Tracking COVID-19 in California. Retrieved

- from: <https://COVID19.ca.gov/state-dashboard/#:~:text=As%20of%20November%2014%2C%20California,data%20from%20November%2013%2C%202020>.
- California Department of Public Health (2020). Data on Racial Demographics. Retrieved from: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Race-Ethnicity.aspx>
- Caniglia B.S., Frank B. (2017). Revealing the resilience infrastructure in cities Preventing environmental injustices-in-waiting. In: Caniglia, B.S., Vallee, M., Frank, B. (2017). *Resilience, Environmental Justice and the City*. Routledge. Accessed 9 May 2020.
- Carpenter, S., Walker, B., Anderies, J. M., & Abel, N. (2001). From Metaphor to Measurement: Resilience of What to What? *Ecosystems*, 4(8), 765–781. doi:10.1007/s10021-001-0045-9
- CDC. Centers for Disease Control and Prevention (2020). Loneliness and Social Isolation Linked to Serious Health Conditions. Retrieved from: <https://www.cdc.gov/aging/publications/features/lonely-older-adults.html#:~:text=Health%20Risks%20of%20Loneliness&text=Social%20isolation%20was%20associated%20with%20about%20a%2050%25%20percent%20increased,32%25%20increased%20risk%20of%20stroke>.
- Chan, J (2014). Community Gardens as Urban Social-Ecological Refuges: Case Studies in Vienna, Austria, Lincoln, Nebraska, and New York City. PhD Dissertation. University of Nebraska. Available at: <https://claremont.illiad.oclc.org/illiad/pdf/552004.pdf> Accessed on 09/20/19
- City of Atlanta. (2020). Parks and Recreation. Retrieved from: <https://www.atlantaga.gov/residents/parks-recreation>
- City of Pomona General Plan. (2014). Retrieved from: http://www.ci.pomona.ca.us/mm/comdev/plan/pdf/General_Plan.pdf
- City of Hope. (2021). Healthy Living Grant Program. Retrieved from:
- Colding, J., and S. Barthel. 2013. The Potential of “Urban Green Commons” in the Resilience Building of Cities. *Ecological Economics* 86: 156–166.
- Community Gardens Minneapolis (2021). Retrieved from: <https://www2.minneapolismn.gov/government/programs-initiatives/homegrown-minneapolis/zoning-urban-agriculture/#d.en.104999>
- Connolly C., Keil R., Ali S.H. Extended urbanization and the spatiality’s of infectious disease: demographic change, infrastructure and governance. *Urban Stud.* 2020;0042098020910873
- County of Los Angeles Public Health Department. (2018). City and community health profiles Pomona. Retrieved from:<http://publichealth.lacounty.gov/ohae/docs/cchp/pdf/2018/Pomona.pdf>.
- Creswell, J. W., Poth, C. N., (2018). *Qualitative Inquiry & Research Design Choosing Among Five Approaches*. Fourth Edition. SAGE.
- Creswell, J.W. 2006. *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. 2nd edition. Thousand Oaks: SAGE Publications, Inc.
- Curran, W. and Hamilton, T. 2012. Just green enough: Contesting environmental gentrification in Greenpoint, Brooklyn. *Local Environment* 17(9): 1027–1042. The original article is available at Taylor & Francis Online: <http://www.tandfonline.com>.
- Dixon-Woods, M., Agarwal, S., Jones, D., Young, B., Sutton, A. (2005). Synthesizing

- qualitative and quantitative evidence: A review of possible methods. *Journal of Health Services Research & Policy*, 10, 45–53.
- Donovan, N.J., Wu, Q., Rentz, D.M., Sperling, R.A., Marshall, G.A., Glymour, M.M. (2017) Loneliness, depression and cognitive function in older US adults. *Int. J. Geriatr. Psychiatr.*, 32 (5), pp. 564-573
- Draper, C., & Freedman, D. (2010). Review and Analysis of the Benefits, Purposes, and Motivations Associated with Community Gardening in the United States. *Journal of Community Practice*, 18(4), 458–492. doi:10.1080/10705422.2010.519682.
- EDD Employment Development Department State of California. (2020). California unemployment rates. Retrieved from: <https://edd.ca.gov/newsroom/unemployment-october2020.htm#:~:text=September's%20unemployment%20rate%20of%2011.0,sectors%20gained%20jobs%20last%20month>.
- EPA. Environmental Protection Agency. (2020). What is open space/green space? Retrieved from:[https://www3.epa.gov/region1/eco/uep/openspace.html#:~:text=Green%20space%20\(land%20that%20is,%2C%20community%20gardens%2C%20and%20cemeteries](https://www3.epa.gov/region1/eco/uep/openspace.html#:~:text=Green%20space%20(land%20that%20is,%2C%20community%20gardens%2C%20and%20cemeteries).
- EPA. Environmental Protection Agency. (2021). Exploring the link between Green Infrastructure and air quality. Retrieved from: <https://www.epa.gov/green-infrastructure/exploring-link-between-green-infrastructure-and-air-quality>
- EPA. Environmental Protection Agency. (2021). Heat Island Effect. Retrieved from: <https://www.epa.gov/heatislands>
- Ernstson, H. (2012). The social production of ecosystem services: A framework for studying environmental justice and ecological complexity in urbanized landscapes. *Landscape and Urban Planning*, 109(1), 7–17.
- ESRI. (2020). What is geocoding? Retrieved from: <https://desktop.arcgis.com/en/arcmap/latest/manage-data/geocoding/what-is-geocoding.htm#GUID-0686F98D-83EB-4083-8685-42F01E9A8B28>
- Fereday, J., Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5, 80–92.
- Ferris, J., Norman, C., & Sempik, J. (2001). People, Land and Sustainability: Community Gardens and the Social Dimension of Sustainable Development. *Social Policy & Administration*, 35(5), 559.
- Fletcher, A. J., MacPhee, M., & Dickson, G. (2015). Doing Participatory Action Research in a Multicase Study: A Methodological Example. *International Journal of Qualitative Methods*. <https://doi.org/10.1177/1609406915621405>
- Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change*, 16(3), 253–267.
- Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T. and Rockström, J. (2010) Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society*, Vol. 15, No. 4, p.20.
- Folke, C., Colding, J., and Berkes, F. (2002). Chapter 14 in Berkes, F., Colding, J., and Folke, C. (eds). *Navigating Social-Ecological Systems: Building Resilience for Complexity and Change*. Cambridge University Press, Cambridge.
- Francis J, Giles-Corti B, Wood L, Knuiaman M.. Creating sense of community: the role of public space. *J Environ Psychol* 2012;32:401–09
- Fuller, R. A., Irvine, K. N., Devine-Wright, P., Warren, P. H., & Gaston, K. J. (2007).

- Psychological benefits of green space increase with biodiversity. *Biology Letters*, 3, 390–394.
- Gardiner C, Geldenhuys G, Gott M.. Interventions to reduce social isolation and loneliness among older people: an integrative review. *Health Soc Care Community* 2018;26:147–57.
- Gilgun, J. (2011). Coding in deductive qualitative analysis. *Current Issues in Qualitative Research: An Occasional Publication for Field Researchers from a Variety of Disciplines*, 2, 1–4.
- Godoy, M., Wood, D. (2020). What do coronavirus racial disparities look like state by state? NPR. Retrieved from: <https://www.npr.org/sections/health-shots/2020/05/30/865413079/what-do-coronavirus-racial-disparities-look-like-state-by-state>
- Gold, S. (1972). Nonuse of neighborhood parks. *JAPA*, 38(6), 369–378.
- Grove, J.M. (2009). Cities Managing Densely Settled Social- Ecological Systems. In F.S. Chapin, G.P., Kofinas, & C. Folke (Eds.), *Principles of Ecosystem Stewardship*. New York, NY: Springer New York.
- Harnik, P. (2010). *Urban green: Innovative parks for resurgent cities*. Washington, DC: Island Press.
- Hartig, T., Evans, G. W., Jamer, L. D., Davis, D. S., & Garling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology*, 23, 109–123.
- Hartig, T. (2008). Green space, psychological restoration, and health inequality. *Lancet*, 372(8–14), 1614–1615.
- Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment & Behavior*, 23,3–26.
- HealthBridge & Advocates for Public Spaces (2014). *Informal Places for active recreation and children's play in Kampala slums Uganda*. Retrieved from: https://healthbridge.ca/images/uploads/library/informal-open-spaces-report_final.pdf
- Hodgkin, S. (2008). Telling it all: A story of women's social capital using a mixed methods approach. *Journal of Mixed-Methods Research*, (2)4, 296-316.
- Holland, L. (2004). "Diversity and connections in community gardens: a contribution to local sustainability." *Local Environment*, 9(3), 285-305.
- Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology*.
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: a meta-analytic review. *Perspectives on psychological science : a journal of the Association for Psychological Science*, 10(2), 227–237.
- Holwerda TJ, Deeg DJH, Beekman ATF, et al. Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam Study of the Elderly (AMSTEL)*Journal of Neurology, Neurosurgery & Psychiatry* 2014;85:135-142.
- Honey-Rosés, J., Anguelovski, I., Chireh, Daher V. K., Konijnendijk van den Bosch, C., Litt , Vrushti Mawani , Michael K. McCall , Arturo Orellana , Emilia Oscilowicz , Ulises Sánchez , Maged Senbel , Xueqi Tan , Erick Villagomez , Oscar Zapata & Mark J Nieuwenhuijsen (2020): The impact of COVID-19 on public space: an early review of the emerging questions – design, perceptions and inequities, *Cities & Health*, DOI:10.1080/23748834.2020.1780074

- Horigian, V. E., Schmidt, R. D., Feaster, D. J. (2021) Loneliness, Mental Health, and Substance Use among US Young Adults during COVID-19, *Journal of Psychoactive Drugs*, 53:1, 1-9, DOI: 10.1080/02791072.2020.1836435
- Hwang, T. J., Rabheru, K., Peisah, C., Reichman, W., & Ikeda, M. (2020). Loneliness and social isolation during the COVID-19 pandemic. *International psychogeriatrics*, 32(10), 1217–1220. <https://doi.org/10.1017/S1041610220000988>
- Ibes, D. C. (2014). A multi-dimensional classification and equity analysis of an urban park system: A novel methodology and case study application. *Landscape and Urban Planning*. 137 122–137
- IBM Corp. (2019). IBM SPSS Statistics for Macintosh, version 26.0. IBM Corp.
- Jacobs, J. (1961). *The death and life of great American cities*. New York, NY: Random House.
- Jennings, V., Larson, L., Yun, J. (2016). Advancing sustainability through urban green space: Cultural ecosystem, Services, equity, and social determinants of health. *International Journal of Environmental Research and Public Health*. 13(96).
- Jeste, D. V., Lee, E. E. and Cacioppo, S. (2020). Battling the Modern Behavioral Epidemic of Loneliness: Suggestions for Research and Interventions. *JAMA Psychiatry*. doi: 10.1001/jamapsychiatry.2020.0027.
- Killgore W.D.S., Cloonen S.A., Taylor E.C., Dailey, N.S. (2020). Loneliness: A Signature Mental Health Concern in the Era of COVID-19. *Psychiatry Res.*
- Kingsley, J., Townsend, M. (2006) Dig into social capital: community gardens as mechanisms for growing urban social connectedness. *Urban Policy and Research: an Australia and New Zealand guide to urban affairs*. 24(4) 525-537.
- Kotwal A.A., Holt-Lunstad J., Newmark R.L., Cenzer, I., Smith, A.K., Covinsky, K.E., Escueta, D. P., Lee, J.M., Perissinotto, C.M. (2021). Social isolation and loneliness among san francisco bay area older adults during the COVID-19 shelter-in-place orders. *J Am Geriatr Soc*;69:20–9.
- Krasny, M. E. and K.G. Tidball. (2012). Civic Ecology: A Pathway for Earth Stewardship in Cities. *Frontiers in Ecology and the Environment* 10(5): 267–273.
- Krasny, M. E., & Tidball, K. G. (2009). Applying a resilience systems framework to urban environmental education. *Environmental Education Research*, 15(4), 465–482. doi:10.1080/13504620903003290
- Kuo, F. E., Sullivan, W. C., Coley, R. L., & Brunson, L. (1998). Fertile ground for community: Inner-city neighborhood common spaces. *American Journal of Community Psychology*, 26(6), 823–851.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry* (First edition). Beverly Hills, Calif: SAGE Publications.
- Lal, R. (2020). Home gardening and urban agriculture for advancing food and nutritional security in response to the COVID-19 pandemic. *Food Security*, 12, 871–876. <https://doi.org/10.1007/s12571-020-01058-3>
- Lawson, L. J. (2005). *City bountiful: A century of community gardening in America*. Berkeley, CA: University of California Press.
- Los Angeles County Public Health Department. (2020). Locations and Demographics. Retrieved from <http://publichealth.lacounty.gov/media/coronavirus/locations.ht>
- Luchetti, M., Lee, J. H., Aschwanden, D., Sesker, A., Strickhouser, J. E., Terracciano, A., & Sutin, A. R. (2020). The trajectory of loneliness in response to COVID-19. *The American psychologist*, 75(7), 897–908. <https://doi.org/10.1037/amp0000690>

- Madanipour, A. (1999). Why are the design and development of public spaces significant for cities? *Environment and Planning B: Planning and Design*, 26, 879–891
- Marne, P. (2001). Whose public space was it anyways?: Class, gender and ethnicity in the creation of Sefton and Stanley parks, Liverpool, 1858–1872. *Social and Cultural Geography*, 2(4), 421–443.
- Masi CM, Chen H-Y, Hawkey LC, Cacioppo JT.. A meta-analysis of interventions to reduce loneliness. *Pers Soc Psychol Rev* 2011;15:219–66.
- Massey, D. (1994). *Space, place, and gender*. Minneapolis, MN: University of Minnesota Press.
- Mayer, B. (2017). A Framework for improving resilience adaption in urban contexts. In: Caniglia, B.S., Vallee, M., Frank, B. (2017). *Resilience, Environmental Justice and the City*. Routledge. Accessed 9 May 2020.
- McPherson, E. G., Nowak, D. J., Sacamano, P. L., Prichard, S. E., and Makara, E. M. (eds) (1993) *Chicago's Evolving Urban Forest: Initial Report of the Chicago Urban Forest Climate Project, General Technical Report No. NE-169*, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station, Radnor, PA
- Meadows, D. H., (2008). *Thinking in Systems: a primer*. Chelsea Green Publishing.
- Mejia, A., Bhattacharya, M., Nigon-Crowley, A., Kirkpatrick, K., & Katoch, C. (2020). Community gardening during times of crisis: Recommendations for community-engaged dialogue, research, and praxis. *Journal of Agriculture, Food Systems, and Community Development*, 10(1), 13–19
- Mertens, D. M. (2003). Mixed Methods and the politics of human research: The transformative-emancipatory perspective. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp.135-164). Thousand Oaks, CA: Sage.
- Mertens, D. (2007). Transformative paradigm: Mixed methods and social justice. *Journal of Mixed Methods Research*, 1(3), 212-225.
- Minneapolis Park and Recreation Board. (2021). Community garden policy. Retrieved from: https://www.minneapolisparcs.org/parks__destinations/parks__lakes/gardens__bird_sanctuaries/community_gardens/community-garden-policy/
- Morahan-Martin, J. Schumacher, P. (2003) Loneliness and social uses of the internet *Comput. Hum. Behav.*, 19 (6) (2003), pp. 659-671
- Moser, A., & Korstjens, I. (2018). Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *The European journal of general practice*, 24(1), 9–18. <https://doi.org/10.1080/13814788.2017.1375091>
- Myers, S. S., Gaffikin, L., Golden, C. D., Ostfeld, R. S., Redford, K. H., Ricketts, T. H., Turner, W. R., & Osofsky, S. A. (2013). Human health impacts of ecosystem alteration. *Proceedings of the National Academy of Sciences of the United States of America*, 110(47), 18753–18760. <https://doi.org/10.1073/pnas.1218656110>
- National Health Foundation. (2018). South LA Green Spaces are no Walk in the Park. Retrieved from: <https://nationalhealthfoundation.org/south-la-green-spaces-are-no-walk-in-the-park/>
- NASEM. National Academies of Sciences, Engineering, and Medicine. 2020. *Social Isolation and Loneliness in Older Adults: Opportunities for the Health Care System*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25663>
- Neal S, Bennett K, Jones H, Cochrane A, Mohan G.. *Multiculture and public parks: Researching*

- super-diversity and attachment in public green space. *Popul Space Place* 2015;21:463–75.
- Neiderud C. J. (2015). How urbanization affects the epidemiology of emerging infectious diseases. *Infection ecology & epidemiology*, 5, 27060.
- Nowak, D. J., Rowntree, R. A., McPherson, E. G., Sisinni, S. M., Kerkmann, E. R., Stevens, J. C. (1996). Measuring and analyzing urban tree cover, *Landscape and Urban Planning*, Volume 36, Issue 1, Pages 49-57, ISSN 0169-2046,
- Okvat, H. A., & Zautra, A. J. (2011). Community Gardening: A Parsimonious Path to Individual, Community, and Environmental Resilience. *American Journal of Community Psychology*, 47(3-4), 374–387. doi:10.1007/s10464-010-9404-z
- Oldenburg R. *The Great Good Place: Café, Coffee Shops, Community Centers, Beauty Parlors, General Stores, Bars, Hangouts, and How They Get You through the Day*. New York: Paragon House Publishers, 1989
- OEHHA. California Office of Environmental Health Hazard Assessment. (2021). What is the CalEnviroScreen? Retrieved from: <https://oehha.ca.gov/calenviroscreen/about-calenviroscreen>
- Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review*, 100 (3): 641-72.
- Panth, S. (2010). Bonding vs. Bridging [Text]. Retrieved September 8, 2014, from <http://blogs.worldbank.org/publicsphere/bonding-and-bridging>
- Parks and Public Health in Los Angeles County. (2016). County of Los Angeles Public Health. Retrieved from: http://publichealth.lacounty.gov/chronic/docs/Parks%20Report%202016-rev_051816.pdf
- Polenick, C. A., Perbix, E. A., Salwi, S. M., Maust, D. T., Birditt, K. S., & Brooks, J. M. (2021). Loneliness During the COVID-19 Pandemic Among Older Adults with Chronic Conditions. *Journal of Applied Gerontology*, 40(8), 804–813. <https://doi.org/10.1177/0733464821996527>
- Rojas, J. (2020) Pomona farm fights food insecurity during coronavirus pandemic. Daily Bulletin. Retrieved from: <https://www.dailybulletin.com/2020/09/15/pomona-farm-fights-food-insecurity-during-coronavirus-pandemic/>
- Rosenberg, M., Luetke, M., Hensel, D. et al. Depression and loneliness during April 2020 COVID-19 restrictions in the United States, and their associations with frequency of social and sexual connections. *Soc Psychiatry Psychiatr Epidemiol* 56, 1221–1232 (2021). <https://doi.org/10.1007/s00127-020-02002-8>
- Rowland-Shea, J., Doshi, S., Edberg, S., Fanger, R. (2020). The nature gap: Confronting Racial and Economic disparities in the destruction and protection of nature in America. Hispanic Access Foundation Retrieved from: file:///Users/juanitapreciado/Downloads/The_Nature_Gap_FINAL.pdf
- Rupprecht, C.D.D., Byrne, J.A. (2017). Informal urban green space as anti-gentrification strategy? In C.W. & H.T (2017). *Just Green Enough*. Routledge.
- Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). Los Angeles, CA: Sage.
- Schewenius, M., McPhearson, T. & Elmqvist, T. Opportunities for Increasing Resilience and Sustainability of Urban Social–Ecological Systems: Insights from the URBES and the Cities and Biodiversity Outlook Projects. *AMBIO* 43, 434–444 (2014). <https://doi.org/10.1007/s13280-014-0505-z>

- Shimpo, N., Wesener, A., & McWilliam, W. (2019). *How community gardens may contribute to community resilience following an earthquake*. *Urban forestry & urban greening*, 38, 124-132.
<https://www.sciencedirect.com/science/article/pii/S161886671830222X>
- Schlosberg, D. (2013). Theorizing environmental justice: the expanding sphere of a discourse. *Environmental Politics*, 22:1, 37-55.
- Shankar A., Hamer M., McMunn A. & Steptoe A. (2013) Social isolation and loneliness: relationships with cognitive function during 4 years of follow-up in the English Longitudinal Study of Ageing. *Psychosomatic Medicine* 75(2), 161–170.
- Shapiro, M., Setterlund, D., & Cragg, C. (2003). Capturing the complexity of women's experiences: A mixed-method approach to studying incontinence in older women. *Affilia*, 18(1), 21-33.
- Sharifi, A., & Khavarian-Garmsir, A. R. (2020). The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. *The Science of the total environment*, 749, 142391. <https://doi.org/10.1016/j.scitotenv.2020.142391>
- Slater, S.J., Christiana, R.W., Gustat, J. (2020). Recommendations for Keeping Parks and Green Space Accessible for Mental and Physical Health During COVID-19 and Other Pandemics. *Prevention of Chronic Disease*. 17:200204. DOI: <http://dx.doi.org/10.5888/pcd17.200204> external icon
- Stevens, W.K. (1995). *Miracle under the oaks: the revival of nature in America*. New York, NY: Pocket Books.
- Stokes E.K., Zambrano L.D., Anderson K.N., et al. Coronavirus Disease 2019 Case Surveillance — United States, January 22–May 30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:759–765. DOI: <http://dx.doi.org/10.15585/mmwr.mm6924e2> external icon.
- Sutin, A. R., Stephan, Y., Luchetti, M., & Terracciano, A. (2020). Loneliness and Risk of Dementia. *The journals of gerontology. Series B, Psychological sciences and social sciences*, 75(7), 1414–1422. <https://doi.org/10.1093/geronb/gby112>
- The Trust for Public Land. (2020). *The Heat is On*. Retrieved from: https://www.tpl.org/sites/default/files/The-Heat-is-on_A-Trust-for-Public-Land_special-report.pdf
- Townsend, A. (2013). *Action research: The challenges of understanding and changing practice*. Berkshire, England: McGraw-Hill International.
- UNDESA (United Nations Dept of Economic and Social Affairs). (n.d.). Urbanization. Retrieved from: <https://www.un.org/en/development/desa/population/theme/urbanization/index.asp>
- U.S. Census Bureau. (2019). Pomona city, California. Retrieved from: <https://data.census.gov/cedsci/table?q=1600000US0658072&tid=ACSSST5Y2019.B03002&hidePreview=true>
- U.S. Census Bureau. (2020). Quick facts Pomona City. Retrieved from: <https://www.census.gov/quickfacts/fact/table/pomonacitycalifornia,losangelescountycalifornia,placercountycalifornia/PST045219>
- Valtorta NK, Kanaan M, Gilbody S, et al. Loneliness and social isolation as risk factors for coronary heart disease and stroke: systematic review and meta-analysis of longitudinal observational studies *Heart* 2016;102:1009-1016.
- Vázquez Morejón, A. J., & Jiménez García-Bóveda, R. (1994). Inventario de conducta social (social behaviour schedule): fiabilidad y validez de un instrumento de evaluación para pacientes mentales crónicos [Social behavior schedule: reliability and validity as an

- instrument for evaluating chronic mental patients]. *Actas luso-espanolas de neurologia, psiquiatria y ciencias afines*, 22(1), 34–39.
- van den Berg, A.E., van Winsum-Westra, M., de Vries, S. et al. Allotment gardening and health: a comparative survey among allotment gardeners and their neighbors without an allotment. *Environ Health* 9, 74 (2010). <https://doi.org/10.1186/1476-069X-9-74>
- Victor, C.R., Pikhartova, J. (2020) Lonely Places or Lonely People? Investigating the Relationship between Loneliness and Place of Residence. *BMC Public Health*, 20
- Walker, B., Holling, C.S., Carpenter, S.R. and Kinzig, A. (2004) ‘Resilience, adaptability and transformability in social-ecological systems’, *Ecology and Society*, Vol. 9, No. 2, p.5.
- Walker, B., & Salt, D. (2006). *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*.
- Weissbourd, R., Batanova, M., Lovison, V., & Torres, E. (2021) *Loneliness in America*. Harvard Graduate School of Education. Retrieved from: https://static1.squarespace.com/static/5b7c56e255b02c683659fe43/t/6021776bdd04957c4557c212/1612805995893/Loneliness+in+America+2021_02_08_FINAL.pdf
- Weisman, L. (1992). *Discrimination by design: A feminist critique of the man-made environment*. Chicago, IL: University of Illinois Press.
- WHO. World Health Organization (2016). *Urban green spaces and health- review of evidence*. Retrieved from: <https://www.euro.who.int/en/health-topics/environment-and-health/urban-health/publications/2016/urban-green-spaces-and-health-a-review-of-evidence-2016>
- Whyte, W. (1980). *The social life of small urban spaces*. Ann Harbor, MI: Edward Brothers Inc
- Wickens, M.C., McDonald, J, A., Tara Elton-Marshall, Samantha Wells, Yeshambel T. Nigatu, Damian Jankowicz, Hayley A. Hamilton (2021), Loneliness in the COVID-19 pandemic: Associations with age, gender and their interaction, *Journal of Psychiatric Research*, Volume 136, 2021, Pages 103-108, ISSN 0022-3956, <https://doi.org/10.1016/j.jpsychires.2021.01.047>.
- Wolch, J., Byrne, J., & Newell, J.P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities ‘just green enough.’ *Landscape and Urban Planning*, 125 (2014), 234-244.
- Yanguas, J., Pinazo-Henandis, S., & Tarazona-Santabalbina, F. J. (2018). The complexity of loneliness. *Acta bio-medica : Atenei Parmensis*, 89(2), 302–314. <https://doi.org/10.23750/abm.v89i2.7404>
- Zoning and Urban Agriculture. (2021). City of Minneapolis. Retrieved from: <https://www2.minneapolismn.gov/government/programs-initiatives/homegrown-minneapolis/zoning-urban-agriculture/#d.en.104999>