Building stewardship for urban forest systems: an evaluation of the leadership model at a local neighborhood tree planting program in Sacramento

By

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ABSTRACT

Urban forests are unique social-ecological systems (Vogt et al., 2015) with different urban greening needs and capacities based on local community guidelines and socio-political circumstances (Curran et al., 2012). To achieve a sustainable urban forest, neighborhood stewardship and long-term maintenance of trees are required (Clark et al., 1997); this is best realized when the community is involved and feels their needs are being met (Wolch et al., 2014). I studied the outcome of a community-leader-driven tree planting program in Sacramento, CA, that aims to address unique urban forestry needs and build neighborhood capacity. This study collected data on urban forest projects adapted to unique community settings and indicators that program outcomes through eight semi-structured interviews with community leaders from the NeighborWoods program at the Sacramento Tree Foundation (SacTree) are meeting goals to build community capacity and address urban forest stewardship. Results found neighborhoods have different needs and socio-political circumstances, which drives the focus of NeighborWoods activities. Leaders play an integral role in building neighborhood capacity to control urban forestry efforts. Interviews additionally reveal that the NeighborWoods model of connecting with a community leader has opened the doors for community members to join planning conversations. Leaders have also been actively engaged in their community and have an intimate knowledge of local issues. They also offer unique connections and skills that benefit their community, and many are looking to inspire others to take on leadership roles. Interviews also reveal a need for the program to adopt an organized stewardship program that focuses on long-term tree care to achieve sustainability, particularly in communities that are disproportionately burdened by a lack of financial or technical capacity.

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INTRODUCTION

As more than half of the world's population lives in cities (Gómez-Baggethun et al., 2013), the dependence on benefits gained from ecosystem services becomes increasingly important. Urban forests are vital to buffer many problems present in cities that affect public health and the quality of life for urban citizens, such as improved air quality, reduced noise, opportunities for recreation, climate regulation, and cultural services (Bolund et al., 1999; Andersson et al., 2014; Farber et al., 2006; Escobedo et al., 2011). When considering the global population growth expected, the world's cities will continue to adapt, with urban forests at the forefront of the critical infrastructure.

The complicated histories of neighborhoods and landscape contexts are crucial considerations when designing urban greening projects. Although community-based design can increase sustained stewardship (Curran et al., 2012; Wolch et al., 2014), there is also value in identifying how community leaders are key actors in urban forest sustainability (Summit et al., 1997; Lang et al., 2006). This research addresses the need for urban forest managers to strengthen communities' capacity to control local greening efforts by analyzing the leadership model utilized by the NeighborWoods program at the Sacramento Tree Foundation (SacTree), a nonprofit tree organization in Sacramento, California. In particular, the research will address the following question: how do the outcomes of the NeighborWoods program practices align with the program's goal of building communities' capacity to address urban forest stewardship? To answer this question, I conducted semi-structured interviews with eight NeighborWoods community leaders to provide narratives for the program's practices and assess how the leaders have affected their neighborhood's capacity. Interviews also provide insight into the critical role community leaders offer in guiding local landscape design strategies.

The NeighborWoods program at SacTree attempts to address the inequities in urban forest cover throughout cities—and therefore inequities in health and social benefits attained from a more robust urban forest—by focusing on improving and sustaining local forests through community action. The NeighborWoods model aims to connect neighborhood leaders and residents to help build community action through tree plantings. SacTree's goal is to support community leaders specifically to grow healthier neighborhoods and become self-sufficient in civic action within their communities.

This program follows recommended guidelines developed by social-science research that state urban greening projects must be explicitly shaped by community concerns, needs, and desires rather than conventional urban design guidelines (Curran et al., 2012). Such an approach requires a balance that could result in more effective urban greening projects that advance environmental equity, public health, and social justice (Wolch et al., 2014). Urban greening projects' resilience requires understanding social-ecological interactions between humans and their urban environment and how to balance them (Romolini et al., 2016). Using concepts supported by scholarly research, this paper analyzes the NeighborWoods leadership model and its effectiveness as a sustainable, community-oriented urban forestry initiative.

As a graduate student studying community development and urban forestry, my positionality is rooted in a belief in the importance of urban greening to improve urban dwellers' lives. My personal and educational goals are to increase urban forestry stewardship and empower individuals to take ownership in the urban ecosystem in which they interact daily; this has established a potentially biased lens with which I view the importance of urban forestry practices within communities. Acknowledging this worldview will help me avoid reporting the research centered around my personal beliefs and add to the results' validity. I approached this research

process mindful that not all communities value urban greening and environmental stewardship precisely as I do.

LITERATURE REVIEW

The NeighborWoods model was designed "to connect with neighborhood leaders and residents and help them build capacity for community action through tree (plantings)" (SacTree, 2020). SacTree and NeighborWoods community leaders developed the NeighborWoods Community Action Toolkit to guide effective and sustainable change within the urban forest, informed by experience with previous projects and research into the public health effects of unequal urban forest distribution patterns. The toolkit serves as a comprehensive guide for community leaders to address environmental and social justice efforts in their communities. Included in the toolkit are information about the program, a reference guide for community members to start their own NeighborWoods project, case studies of NeighborWoods projects, and a resource guide for marketing and networking. Ultimately, the goal is not to provide a "how-to" guide but instead offer a reference to help guide flexible decision-making when planning a project. SacTree describes the toolkit as a flexible document that will "change and grow" just as the organization's "understanding of, ability to work in, and engagement with diverse communities across Sacramento will change and grow" (SacTree 2020).

Following an analysis of the toolkit, four key themes emerged that form the NeighborWoods program's base and goals: 1) unique social-ecological systems, 2) community leadership, 3) community capacity-building, and 4) long-term urban forest stewardship. This review considers these four central bodies of thought related to the NeighborWoods program and analyzes the consistency of programmatic goals related through the toolkit with project outcomes. This review examines the SES concept suggesting that each neighborhood has unique

socio-political circumstances and needs that can affect communities' activities and ability to achieve a sustainable urban forest. This includes concepts like community representation in the landscape and inequities in urban greening practices, which can determine unique community needs. Next, I focus on the critical role community leaders play in the decision-making process that affects urban forestry outcomes. They also offer a representation of community needs and unique skills and connections. Third, I review the varying levels of community capacity throughout neighborhoods and how that affects a community's ability to address local issues. The final concept explores the complexity of urban forest stewardship and the responsibility of post-planting tree care. In combination, the proposed outcome is expected to confront environmental inequities, grow healthier communities, and support a sustainable and resilient urban forest.

Urban forests as unique social-ecological systems (SES)

The term "social-ecological system" (SES) has grown in use in the scientific literature over the last decade due to global changes and environmental crises (Herrero-Jáuregui et al., 2018). There is an urgent need to understand how humans affect and are affected by nature, and SES offers a theoretical concept to describe the complexity of integrating social and ecological sciences (Herrero-Jáuregui et al., 2018). An SES has been described as "a system of people and nature" (Thomas et al., 2012); a system "where social and ecological systems are mutually dependent" (Fidel et al., 2014); and a system of "linked human and natural components" (Vogt et al., 2015). Recent trends in the SES definition include governance systems, particularly in publications focused on land management and decision-making (Herrero-Jáuregui et al., 2018).

Ostrom (2009) describes an SES as being "composed of multiple subsystems and internal variables within these subsystems at multiple levels" and then goes on to explain how this is much like the functioning of an organism with interworking parts like organs and cells.

According to Ostrom (2009), in a complex SES, subsystems such as a resource system, resource

units, users, and governance systems all "interact to produce outcomes at the SES level, which in

turn feedback to affect these subsystems and

their components." Ostrom (2009) proposes a

framework (See *Figure 1*) to analyze SES and

defines the variables that should be measured

in each SES subsystem. These components all

interact in an adaptive cycle and affect each

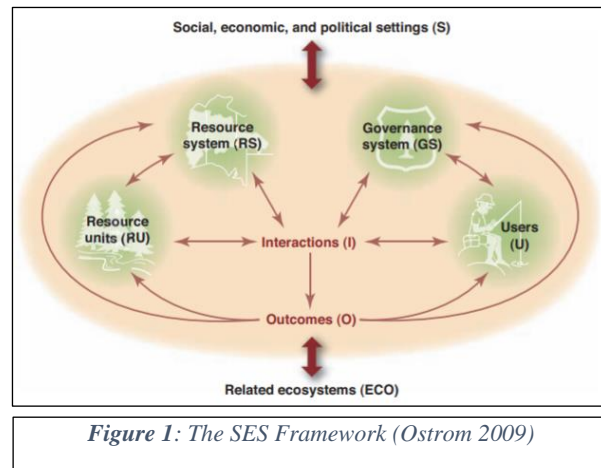other to form a complex web of linked social,

Figure 1*: The SES Framework (Ostrom 2009)*

economic, and political settings and related ecosystems. Ostrom's (2009) SES framework pushes

back on previous "one-size-fits-all" recommendations to manage natural resources. Instead, the

framework applies a multi-disciplinary approach to understand complex ecological and socio-

political contexts that can affect the likelihood of self-organized efforts to achieve a sustainable

SES.

Building upon the SES framework presented by Ostrom (2009), Vogt et al. (2015) propose

that urban forests can be understood as a social-ecological system due to the linked human and

natural components. Although the Ostrom SES framework is applied to social and ecological

outcomes in rural natural resource systems, Vogt et al. (2015) present an applicable urban forest

SES framework that builds upon the urban forest sustainability model by Clark et al. (1997).

Through this perspective, Vogt et al. (2015) have identified the four SES subsystems that

contribute to tree success: 1) the trees (and their characteristics) as the resource units; 2) their

biophysical environment as the resource system; 3) the users are the surrounding community;

and 4) the governance systems are the maintenance institutions that affect the tree (i.e., the rules,

norms, or management strategies related to neighborhood maintenance of trees) (*See Figure 2*)—
accepting urban forests as SESs suggests that communities can affect the trees and their success
in a city's altered urban landscape.

Social–ecological system (SES) framework (Ostrom, 2009)	Model of urban forest sustainability (Clark et al., 1997)	Urban forests as social–ecological systems
Resource system	Vegetative resource	Biophysical environment
Resource units		Trees
Users	Supportive community	Community
Governance system	Adequate management	Institutions[a] and management

Figure 2: *Urban Forests SES framework (Vogt et al. 2015) developed from the SES framework (Ostrom 2009) and the model of urban forest sustainability (Clark et al.1997).*

Recognizing the variability in tree canopy coverage throughout the Sacramento area and
the availability of resources to address these inequities (see *Appendix B*), the NeighborWoods
program is designed to inspire community leaders to determine the neighborhood's unique needs
and assets to serve their community better. A sustainable urban forest depends on the local
community's interactions to support and maintain its function, which requires the community to
agree on the benefits of trees and a shared vision for their local forest (Clark et al., 1997). Urban
forestry initiatives that fit within the social fabric of an SES and the neighborhoods' essence and
consider the complicated histories and needs of community residents can more effectively
address environmental inequities.

Other studies further demonstrate how social, economic, and political settings can affect an
SES outcome. Vogt et al. (2015) found that in addition to tree characteristics and their
biophysical environment, the demographics of a community and applied institutional
maintenance can influence tree success. For example, Vogt et al. (2015) found that median
household income, the percentage of renter- and owner-occupied units, the percentage of people
who have recently moved to the neighborhood, and the rate of single-parent households affect
tree growth and survival. In Sacramento, Roman et al. (2014) found that tree survivability of the

Sacramento Municipal Utility District (SMUD) Shade Tree Program was best predicted by homeowner stability; higher survival rates were observed on stable properties. Interestingly, well-maintained trees were also more likely to be found on properties with stable homeownership (Roman et al., 2014). This study is particularly insightful to the NeighborWoods program as SacTree and SMUD began the Sacramento Shade Tree Program in 1990 to strategically plant energy-saving shade trees in response to Sacramento's sweltering summers and shifting peak electricity usage season due to air-conditioning usage (McPherson & Luttinger, 1998). Sacramento County residents can receive up to ten free shade trees through the Sacramento Shade Tree Program (SacTree, 2019). The NeighborWoods program is dependent on the trees provided through the Shade Tree Program.

Ko et al. (2015) found a weaker relationship than Roman et al. (2014) in the effect that homeowner stability has on tree mortality (potentially due to the researchers' inability to determine rental status). However, this study found that socioeconomic status significantly affected young tree mortality (Ko et al., 2015). These studies support the assertion that consistent stewardship is critical for tree performance on residential properties and that the social influence on urban forest sustainability is significant. Under this context, the urban forest can be understood as an SES with existing or potential abilities to organize and maintain a self-governing system to manage natural resources.

Following this thought of complicated social and ecological ties, Elmendorf (2008) has claimed that people's relationship with the natural environment gives them a stronger connection to place. The author argues that trees and landscapes can be seen as shared and structured symbols that become part of a place's identity, invoking pride and a sense of place. Stewart et al. (2003) further this concept by utilizing photo-elicitation to identify the landscape's community-

based meanings while using local insight to inform future landscape design and alteration. These researchers similarly found that when local landscape improvements incorporated these techniques, the projects were often completed through collective action and were thought to be sources of community pride. This method additionally helped shape the communities' visions for change; solutions were more mindful of local history and less focused on traditional environmental strategies. Findings also support participants' general support for landscape change, but only when it enhanced a sense of locality. Similarly, aesthetically pleasing neighborhoods elicit 'place attachment,' which positively relates to neighborhood ties (Watkins et al., 2018). A landscape that represents the neighborhood and encourages place attachment suggests an increased likelihood of communities participating in and support activities that would sustain an SES.

Studies have shown that varying tree cover patterns and access to green space exist throughout the urban environment (Anguelovski, 2013; Wolch et al., 2014). Community demographics are often an indicator of the differences in tree canopy needs throughout neighborhoods. Cities usually have uneven tree coverage patterns, in which the elite and high-income areas have more extensive stands of trees than lower-income areas (Ernstson, 2013). To see examples of varying patterns of canopy coverage throughout California cities, see *Appendix B-D.* These maps highlight existing patterns of low canopy coverage in disadvantaged communities in the Sacramento urban area, the San Francisco Bay Area, and the Los Angeles urban area. Low-income communities and communities of color have less access to green space, parks, or recreational programs than their white or more affluent counterparts (Wolch et al., 2014). Similarly, Locally Unwanted Land Uses (LULUs) (i.e., incinerators, landfills, or

refineries) have traditionally been placed in poor black or Latinx neighborhoods rather than in affluent suburbs of the U.S. (Anguelovski, 2013).

Climate change additionally exacerbates vulnerability in these communities without climate adaptation strategies like urban tree cover (Shi et al., 2015). The local climate and sometimes the weather is affected by urban activity (Bolund & Hunhammar, 1999). The urban heat island effect (UHIE) describes the phenomena of higher temperatures in urban cores due to increased artificial or human-made surfaces (Pickett et al., 2001). There is typically more anthropogenic heat production in urban areas, less heat reflected into the atmosphere, and more heat stored (Adler et al., 2013). When energy inputs exceed the levels of heat leaving, the surface warms by holding heat in the ground and infrastructure. In addition, increased temperatures enhance ozone formation in and around cities, exacerbating already increased levels of air pollution due to human activity (Pickett et al., 2001).

In urban areas with less permeable surfaces (i.e., green space), there are more significant adverse effects and increased UHIE intensity. Dialesandra et al. (2021) found that low-income and Latinx populations are the most impacted by 'thermal inequities' in urban areas. On average, both the poorest 10% of neighborhoods studied in the Southwest U.S and the top deciles of Latinx neighborhoods experience temperatures about 4° Fahrenheit hotter than the wealthiest neighborhoods and the lowest decile Latinx population, respectively, on both extreme heat days and average summer days (Dialesandra et al., 2021). As the effects of global climate change continue to intensify, Sacramento County (an already historically hot, dry area) remains vulnerable to shifts in climate. Urban greening can mitigate the impact of increased temperatures by utilizing trees to shade buildings and impervious surfaces and cool the ambient air through evapotranspiration (Chen et al., 2014).

Recent trends in environmental justice literature challenge these inequities (Anguelovski 2013). To improve public health and reduce the prevalence and impact of unequal environmental injustices in traditionally marginalized communities, they believe, city planning processes must apply a more holistic and community-based approach through a critical look at the inequities of exploitative power dynamics. This plays into the "right to the city" concept, initially proposed by Lefebvre (1996) and described by Anguelovski (2013) as citizens' rights to be involved in decisions affecting their social and spatial relations based on "participating in the daily making of the urban fabric" by living in and using the city. This connects to a broader call for spatial justice and challenges the historical organization of space and devaluation of marginalized communities, contributing to degraded infrastructure and unequal concentration of environmental toxins.

Statewide climate initiatives offer funding opportunities to serve disadvantaged communities to increase resilience. California implemented the California Global Warming Solutions Act of 2006 (AB 32), an ambitious law that set a goal to reduce the state's greenhouse gas (GHG) emissions (CARB, 2019). Supplemental to AB 32, SB 535 requires sums of money collected by the state board from the cap-and-trade auction or sale of allowances, or offsets, to be deposited in the Greenhouse Gas Reduction Fund (OEHHA, 2019). The cap-and-trade program proceeds are then distributed through California Climate Investments (CCI) to further the state's climate goals (CCI, 2020). SB 535 additionally requires the California Environmental Protection Agency (CalEPA) to designate disadvantaged communities in California to inform investment priorities for its cap-and-trade program (OEHHA, 2019). The top 25 percent of census tracts most impacted by and disproportionately burdened by multiple sources of pollution—identified by CalEnviroScreen 3.0—are designated disadvantaged communities. Ten percent of proceeds

are required to fund projects located within those communities (OEHHA, 2019). These investments aim to improve public health, quality of life, and economic opportunity in California's most burdened communities while reducing pollutions that contribute to climate change.

Urban forestry initiatives supported by the California Urban Forestry Act of 1978 align with SB 535 and receive CCI funds distributed through the California Department of Forestry and Fire Protection (CAL FIRE) (CAL FIRE, 2012). Benefits from funded projects aim to meet the state's GHG emission reduction targets. Additionally, as a high emitting utility company, SMUD emissions are regulated through the California cap-and-trade program; among their mitigation strategies, they purchase carbon offsets that support local projects to reduce carbon emissions (SMUD, 2016). The Sacramento Shade Tree Program falls into their carbon reduction profile.

CCI funds and other climate initiatives have increased funding potential for urban forestry initiatives and initiatives that support disadvantaged communities. However, a necessary consequence to consider when transforming neighborhood tree canopy coverage is neighborhood gentrification threats. An increase in green space can improve the attractiveness and public health, making neighborhoods more desirable and potentially leading to increases in local housing costs (Wolch et al., 2014; Curran et al., 2012). Rising housing costs can lead to gentrification and displacement of the marginalized communities that urban greening was meant to serve.

To address the potentially harmful outcomes of increased urban greening for low-income communities and communities of color, Curran et al. (2012) has put forth a strategy called "just green enough" following a case study analysis of a green city means to different gentrifying

neighborhoods. Greenpoint neighborhood in Brooklyn is an industrial center for shipbuilding and oil refineries, home to primarily working-class immigrants and Latinxs. Following decades of oil spills and the opening of waste treatment facilities, new development generated hope for a neighborhood cleanup. However, this brought on increased fear of environmental gentrification. Curran et al. (2012) point out that cleanup makes a neighborhood more attractive and may drive up real estate prices, forcing up rents and leading to the displacement of residents previously suffering from environmental ills.

Similar claims have been made by Wolch et al. (2014), who suggest that urban green space strategies may have paradoxical results such as environmental gentrification. Greenpoint resident activists have confronted this threat by constructing an environmental vision that both greens the neighborhood while also maintaining its working-class character and allowing space for the community residents to participate in the process (Curran et al., 2012). In this case, Curran et al. (2012) have highlighted the complexities of what it means to be "green:" the Greenpoint study challenges green as only beautiful or "natural" and instead recognizes the historical injustices, demanding cleanup for the direct benefit of those who are vulnerable. This study makes a case for the importance of creating a more democratic, diverse, and just view of what green looks like in each neighborhood by allowing the community to be involved in the decision-making process. Wolch et al. (2014) comment that the "just green enough" strategy requires challenging conventional design strategies and allowing green projects to be shaped by community concerns, needs, and desires.

Community Leadership

Within the NeighborWoods program, community leaders can provide an integral opportunity for the neighborhood to voice community concerns, and urban forestry needs to help

shape greening projects. SacTree turns to neighborhood leaders to effectively guide the decision-making process and affect the outcome of local urban forestry initiatives. Guided by their local knowledge and connections, leaders offer community voices an opportunity to express concerns, needs, and desires. The leaders then attempt to engage the urban forest SES users to challenge and be a part of the governance systems that contribute to urban forest outcomes. This personal momentum is significant for historically underserved communities.

Patterns of less access to benefits from trees and ecosystem services are moderated through socio-political processes. Exploitative city planning actions—such as historic redlining and disinvestment in specific neighborhoods (Powell, 2009), and varying levels of power to control and maintain access to resources (McDermott et al., 2013)—are driven by socio-economic processes and constrain specific communities from access to ecosystem services and greater quality of life. Existing access and power relationships affect certain groups' ability to win or lose from ecosystem service markets (McDermott et al., 2013). McDermott et al. (2013) argue the extent to which marginalized groups are recognized within a socio-political system is critical in assessing procedural fairness. Yet, they are often missing or unrepresented in planning conversations. Pre-existing political, economic, and social conditions create uneven access to engage in and benefit from resource distribution. While ecosystem management dictates which ecosystem services to prioritize in specific spaces, it is essential to recognize that values are constructed and hierarchized through social processes (Ernstson, 2013).

Summit et al.'s (1997) analysis of local tree planting programs found that a community's active involvement and participation in the planning process affected attitudes toward tree-planting efforts. They recommend several strategies to guide behavioral change toward environmental protection: provide rationales and information about what to do and how and

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where to do it; emphasize practical, personal benefits of environmental behavior; work directly with community groups or residents; create opportunities to work together to increase commitment and create a new social norm; and make requests for action personal (i.e., from a known individual, and not a stranger). The last strategy particularly points to a need for communications from known and respected community leaders to rally behind environmental activities, which would increase the likelihood of participation.

Community leadership literature centers around building community capacity as a whole, but little has been written on a sustained resident community leader's specific effect in civic action. Leadership in urban forestry is often a title reserved for organizations and their leaders (Moskell et al., 2013; Svendsen et al., 2008) or those in power to affect decision-making (McLean et al., 2004). However, as residents themselves, community leaders are valuable to their communities to understand local issues, utilize existing connections, and inspire a greater sense of trust between other residents (Lang et al., 2006). The defined role of community leaders in building community capacity and addressing community-design principles for more sustainable urban forests is essential to the successful management and stewardship of urban forests.

Community Capacity-Building

With the critical support of a community leader, the NeighborWoods model ultimately attempts to help neighborhoods build community action capacity through tree plantings. Community capacity has been defined simply as community members' strengths and assets both individually and collectively brought to a cause (Elmendorf, 2008). More complexly, it is defined as the interaction of human capital, organizational resources, and social capital within a given community that can be leveraged to solve collective problems and improve or maintain a

given community (Chaskin, 2001). Although many definitions attempt to characterize community capacity, Chaskin (2001) suggests agreement on a few themes in the literature: the existence of resources; networks of relationships; leadership; and support for varying processes or mechanisms for community members' participation in collective action and problem-solving. Based on these themes, Chaskin (2001) suggests a four-part framework for community capacity characteristics— 1) a sense of community, 2) a level of commitment among community members, 3) the ability to solve problems, and 4) access to resources. Different levels of community capacity are likely to exist in each neighborhood. Still, the author claims that communities with a larger capacity can influence policies that directly affect them and find resources to support their development.

To help visualize how SacTree supports capacity building in each neighborhood, they have modified the International Association for Public Participation's (IAP2) "Spectrum of Public Participation" and proposed the NeighborWoods "Spectrum of Participation" (*See Figure 3*). IAP2's Spectrum of Public Participation is designed to assist organizations and programs with selecting the level of their participation which in turn helps define the public's role in any public participation process (IAP2 2018). SacTree aims to provide project support more heavily in the beginning and step back into a more supportive role as leaders and communities become more comfortable leading and

SPECTRUM OF PARTICIPATION

SacTree guides activities & leadership

SacTree collaborates with & provides guidance to community

SacTree takes a supporting role

OUTSIDE SUPPORT

NEIGHBORHOOD LEADERSHIP

Early interest in community action

Community takes on greater leadership & provides feedback about activities

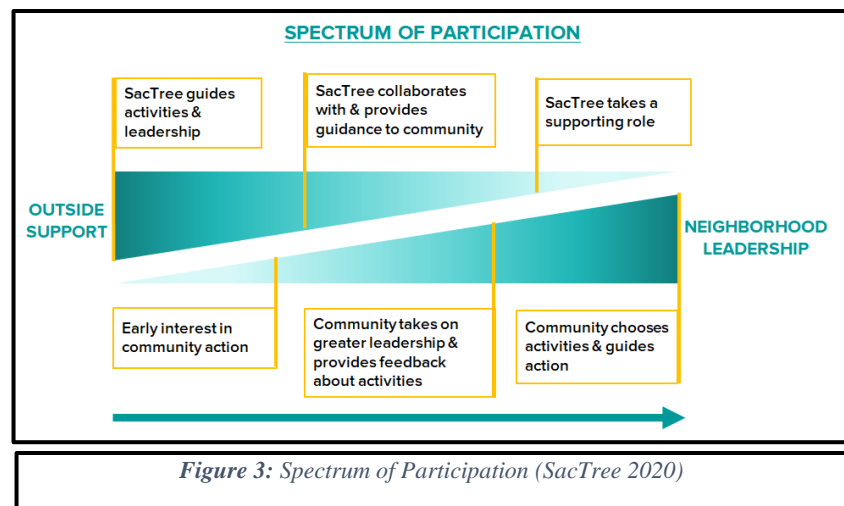Community chooses activities & guides action

Figure 3: Spectrum of Participation (SacTree 2020)

carrying out their projects. SacTree initiates a transition of the responsibilities highlighted in the Spectrum of Participation, which transitions from more outside support to greater neighborhood leadership, resulting in greater leadership responsibilities and decision-making power to guide action, ultimately signifying increased capacity to implement projects.

Chaskin (2001) found that neighborhoods enact varying strategic paths based on local community guidelines to build community capacity. Locally driven efforts have helped catalyze further activity in the neighborhood by local government, focusing on neighborhood issues. On the other hand, Watkins et al. (2018) found mixed evidence in a nonprofit tree planting program's ability to build community capacity. These researchers found that while tree plantings helped build neighborhood ties, there was no relationship between plantings and building trust or connections between neighbors on similar values (Watkins et al., 2018). Residents did, however, report positive changes in their neighborhood following tree plantings, including community beautification and more time spent taking care of private yards. These all demonstrate changes in community capacity and a deeper connection to the green spaces in their neighborhood.

Unfortunately, not all communities have the ability to build community capacity around urban greening initiatives. Marginalized communities tend to have less protective capacity for green areas, decreasing their power to resist ecological degradation and disappearance from the ecological network (Ernstson, 2013). Ernston (2013) additionally argues marginalized communities often suffer from a lack of 'management capacity,' defined as communities' capacity to carry out stewardship practices that sustain ecological function through the respective green areas in the ecological network. Capacity depends on the actors that influence decisions (i.e., city planners), public stewardship, and resource availability. The protective and management capacities of green spaces strongly influence the generation and distribution of

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ecosystem services (Ernstson, 2013). Furthermore, placing the burden of responsibility on local entities without strengthening their financial and technical capacity weakens their ability to engage in sustainable and resilient environmental planning—this can disadvantage many low-income and marginalized communities (Shi et al., 2016).

Long-term urban forest stewardship

A community's capacity to carry out and engage in urban tree stewardship is limited by technical knowledge and financial resources. Still, it is crucial for long-term urban forest sustainability. Romolini et al. (2016) define stewardship in response to public problems as conserving, managing, caring for, monitoring, advocating for, and educating the public about local environments. More specifically, Moskell et al. (2013) describe urban tree stewardship as post-planting maintenance of trees, such as watering, mulching, removing litter, and pruning. Roman et al. (2014) use stewardship broadly "to encompass the sense of responsibility for trees as it manifests in maintenance actions." In this case, there is a focus on appealing to individuals to feel a connection or ownership to the tree that results in tree care beyond just participating in maintenance actions. Romolini et al. (2012) further the personal relationship developed through their definition of stewardship: "a relationship with the Earth that is based on respect for nature, and a current and ongoing commitment to 'active earthkeeping' akin to a custodial or guardianship role."

Studies have found that planting and maintenance activities, program management, and site characteristics are critical for high tree establishment survival (Clark et al., 1997; Roman et al., 2015; Vogt et al., 2015; Locke et al., 2014). Romolini et al. (2016) make a case that sustainable and resilient urban SESs require active engagement from many actors. Still, civic stewardship networks' social complexity can be challenging to assess, particularly across socio-

political boundaries. Romolini et al. (2016) suggest a social-ecological framework to inform urban stewardship network analysis and better understand natural resource governance in urban environments. Key results promote urban sustainability and resilience by understanding stewardship networks and combining different social and ecological lenses of analysis. Civic stewardship asks ecological and social scientists to look beyond disciplinary boundaries and technical approaches to engage various stakeholders to find solutions to complex problems (Romolini et al., 2016).

The debate around which party holds ultimate responsibility for the urban forest's stewardship continues between communities and the external entities that may support the initial tree-planting program. Svendsen et al. (2008) address the complex and dynamic networks of civil society, government, and business sectors to better understand urban ecology stewardship organizations' role. Case study analysis of stewardship organizations revealed dynamic social networks of organizations within cities that could be better utilized. The authors argue that stewardship groups' capacity can be strengthened through multi-scaled, capacity-building networks (Svendsen et al., 2008). Moskell et al. (2013) present conflicting ideas of who should be in charge of tree stewardship. In this study, residents believe the government should ultimately be responsible for tree care, rather than themselves, other non-governmental organizations, or through a shared effort among community groups. This belief was strongly tied to educational interests—residents with an academic interest related to urban forestry were more likely to support residents' role in caring for the trees. Moskell et al. (2013) hint that residents' reliance on government tree stewardship is not sustainable and suggests the need to investigate people's attitudes towards stewardship to understand their eventual participation in stewardship activities. As previously discussed, public involvement and support of urban forestry activities

are crucial for long-term success, especially in communities that have historically been left out of receiving public services. Nonprofits with technical knowledge and deep ties to neighborhoods and local institutions made coordinating tree care more straightforward and effective (Moskell et al., 2013). When nonprofits planned for post-planting maintenance through volunteer coordination and cultivated lasting relationships with expert volunteers, tree establishment survival was significant (Roman et al., 2015).

Clark et al. (1997) define a sustainable urban forest as "the naturally occurring and planted trees in cities which are managed to provide the inhabitants with a continuing level of economic, social, environmental and ecological benefits today and into the future" (Clark et al., 1997). The model of urban forest sustainability, developed by Clark et al. (1997), identifies three necessary elements for a sustainable urban forest: a healthy vegetation resource (the trees and their growing environment), a supportive community, and an exemplary management regime. Dwyer et al. (2003) offers a less specific definition but focuses on the community's role in managing and using the environmental benefits. They highlight the value of "maintaining healthy and functional vegetation and associated systems that provide long-term benefits desired by the community" (Dwyer et al., 2003). A sustainable urban forest requires community cooperation, quality care, continued funding, and personal involvement to maximize benefits and minimize costs. This acknowledges a need for a shared vision and long-term responsibility by diverse local actors.

The key themes analyzed in this literature review contain essential strategies to address the need for equity in urban forestry practices that lead to sustainable urban forests. Community involvement in urban forest SESs is critical for success. As the NeighborWoods program intends to implement a more holistic approach to urban forestry, an analysis of the NeighborWoods

model offers insight into a potential strategy to increase community involvement and stewardship. Understanding the program's efficacy in implementing these strategies can inform the need for other urban forest managers and involved entities to adopt similar practices.

METHODS

I utilized qualitative research through semi-structured interviews with eight NeighborWoods community leaders to help gain insight into their personalized neighborhood event and provide narratives for how community leaders have organized their neighborhoods to address urban forest stewardship. The sample was selected from the fifteen currently active community leaders in the NeighborWoods program; one leader has since moved and is currently inactive. Initial contact to leaders went through SacTree, who requested participants in the research study. Most of the participants proactively and enthusiastically reached out to me directly. Follow-ups were made with the remaining leaders, resulting in eight interviews. All interviews were conducted either by phone or through Zoom video conferencing due to the outbreak of COVID-19 and mandated social distancing protocols. Talks varied in time from 30 to 60 to 90 minutes.

Additionally, all volunteers who have participated in NeighborWoods projects received an online survey, targeted through the SacTree volunteer listserv, generating 38 responses (an 8.5% response rate). Initial contact with volunteers went through SacTree, who requested participants in the research study and provided the online survey link. Survey answers do not specifically refer to the eight neighborhoods highlighted in this study; the survey was sent to 444 volunteers from all NeighborWoods projects from October, 2019 to March, 2020. This is due to the concern for low response rates if restricted to the neighborhood. Also, a survey highlighting

the efficacy of the NeighborWoods program's overall influence over volunteers' attitude and behavior offers a broader look at the program through the participants' lens.

Interview questions were structured based on the four key themes identified earlier: urban forests as unique social-ecologic systems, community leadership, community capacity, and long-term urban forest stewardship. These have been identified through the toolkit analysis as the goals and visions that guide the NeighborWoods program. Therefore, interview data can help evaluate consistencies with programmatic goals and outcomes of projects, mainly their goal to build community capacity through the leadership model. Interviews helped provide insight into the efficacy of these objectives. Inquiries explored each unique neighborhood program, adapted to local needs, further stewardship activities, and the role the community leader plays in building community capacity around the urban forest. Text data from transcripts were organized and coded into the toolkit themes for analysis (*See Table 1*). Data collected focuses on indicators of the four themes revealed in the literature review. Indicators hint to how individuals or neighborhoods begin to exert control and influence over decisions that affect the green spaces they interact with daily, organizational functioning, and attitude/behavioral outcomes due to the NeighborWoods projects.

Table 1: Community leader interview questions, the targeted toolkit themes and indicators looked for to answer research question.

Interview Question	Targeted Toolkit Theme(s)	Indicators Looked For
1. How would you characterize your neighborhood's current urban forest?	SES	Community characteristics; specific needs; the history of neighborhood; community demographics
2. What would an ideal urban forest look like for your neighborhood?	SES; community leadership	Specific needs; project goals; leadership goals
3. Describe the project in which you participated.	SES; community leadership; community capacity	Project characteristics; specific needs; decision-making actions; the history of neighborhood; leadership skills; resources used; project outcomes
4. What inspired you to become active in your community?	Community leadership	Leadership motivations; previous leadership experience; understanding of local issues; existing connections

5. What does the urban forest mean to you?	Community leadership	Leadership motivations; leadership goals
6. How do you communicate the value of your NeighborWoods project and the urban forest to the volunteers?	SES; community leadership; stewardship	Specific needs; leadership skills; contextualizing project for the neighborhood
7. How has this project led to further action in your community?	Community capacity; stewardship	Decision-making actions; urban greening initiatives; community advocacy; network building; relationship building; stewardship activities; collective action; team building
8. How do you feel your role as a leader affected the capacity of your neighborhood to address urban forest needs?	Community capacity; community leadership	Network building; relationship building; communication resources; community assets; funding opportunities; community resources; problem-solving skills; community advocacy; collective action
9. How has your leadership style evolved from the beginning of the project to now?	Community leadership	Leadership style; community involvement; decision-making actions; personal development; team building
10. What has this experience of being a community leader meant to you?	Community leadership	Leadership motivations; community advocacy; personal development; place attachment
11. What resources did you utilize during your project implementation?	Community capacity; community leadership	Community resources; network building; relationship building; community advocacy; community assets; funding opportunities; communication resources
12. How is your neighborhood supporting the NeighborWoods project and other urban forest efforts?	Stewardship; community capacity	Supportive actions; stewardship activities; community motivations; collective action
13. What are the management strategies your neighborhood has enacted for long-term tree care?	Stewardship	Stewardship activities; supportive communities; responsibility of tree care; long-term plans; stewardship needs
14. What are the further needs from the NeighborWoods program and SacTree?	SES; community leadership; community capacity; stewardship	Specific needs; stewardship needs; resources needed; program outcomes

Similarly, survey questions were designed around the four main themes of the toolkit; however, there was a stronger focus on stewardship of the urban forest due to the NeighborWoods project. Questions were drafted on a sliding scale from 5 (strongly agree), 4 (agree), 3 (neutral), 2 disagree, and 1 (strongly disagree). Three sets of questions used a before-and-after approach to gauge changes in confidence in tree planting ability, volunteers' understanding of urban forestry benefits, and sense of urban forest ownership before taking part in a NeighborWoods project versus after. Overall, survey questions focused on identifying factors contributing to urban forest sustainability and assessing volunteers' knowledge acquisition and stewardship for the urban forest following NeighborWoods tree-planting events.

Results are reported as a percentage of survey participants who chose that answer (out of 38 respondents). Survey questions were designed to supplement leader stories with information from the volunteers' perspective.

Interviews refer to eight separate neighborhoods in Sacramento, unincorporated Sacramento County, and other cities in Sacramento County. Any information that directly or indirectly identified the interviewees was not recorded—neither the names of the community leaders nor the neighborhood they are referencing will be published in this research. A discreet study is crucial to protect participants' anonymity and allow for free speech and valuable data collection. Respecting individual processes rooted within potential power imbalances and respecting the participants' privacy are all necessary while reporting. I have assigned pseudonyms for the leaders and neighborhoods to protect the future of the neighborhoods' programmatic support and encourage participation in the study.

All interviews took place between August 25, 2020, and September 24, 2020. It is significant to note that the world was in a state of fear and tumult during this period due to the outbreak of COVID-19, a global pandemic. Businesses were shut down, large gatherings were discouraged, children attended school virtually, and everyone was encouraged to stay home and slow the spread. Stress was high in the early months of the pandemic. Along with the global health crisis, Sacramento experienced a record-setting heatwave and the worst wildfire season. It was also around this time the nation was in the midst of deep racial tension over the police-involved killing of George Floyd. Due to these circumstances' weight, it would be impossible to deny they had any effect on the outcome of this research. Shade, climate change, clean air, healthy communities, and social justice were at the front of everyone's mind, which could have easily affected the narratives' outcome, albeit all relevant subjects to urban forestry initiatives.

This report is limited by the amount of information that each leader was willing to share during the interview. While some community leaders paint a detailed image of their neighborhood and urban forest activities, a few were not so descriptive. This results in varying information within each theme and inconsistent detail to describe the impact their NeighborWoods projects had on their neighborhood. However, these are the stories that interviewees wish to share; they help make each community more unique in their focus. A limitation exists in the lack of personal interaction between the interviewer and interviewee due to video conferencing interviews instead of face-to-face. In combination with the stress of current affairs, this may have affected how the stories were communicated and recorded.

RESULTS

The results of these interviews are additionally reported in the same grouping of the four toolkit themes (urban forests as unique social-ecologic systems, community leadership; community capacity; and long-term urban forest stewardship). First, the data that defines the unique circumstances in each neighborhood are presented to describe the SES. Second, data looks at the role of the community leader and how they direct NeighborWoods activities; then, the data illustrate the varying levels of neighborhood capacity and how NeighborWoods activities affect these levels; and finally, stewardship activities and needs are highlighted.

Interviewees were asked how they implement NeighborWoods projects for their neighborhoods and the unique circumstances that define community needs and goals. This data informs the theory of an urban forest SES where each community has varying ecological and socio-political contexts that guide community activities. *Table 2* summarizes the descriptive information community leaders shared about their neighborhood and its urban forest. While

similar circumstances are existing between some of the neighborhoods, it is clear they have different needs, which drives NeighborWoods activities' focus.

Table 2: Descriptive information about the neighborhoods and their unique urban forest circumstances and needs

Neighborhood	Descriptive Information About Neighborhood (data from community leader interviews)	Neighborhood Urban Forestry Needs/Goals (data from community leader interview)
Oak Village	• Desirable neighborhood in Sacramento County for its affordability • Home to long-term elderly residents as well as younger mid-twenty to mid-thirty-year-old professionals and families • Car-oriented; not very walkable	• Inconsistent tree cover; lines up with established homes • Create connections between community and local businesses • Improve neighborhood walkability, especially to local businesses
Floral Heights	• Built in the 1950s • Desirable neighborhood in Sacramento County for its relatively central location and close access to freeways and main hubs in the city, like the local university and downtown Sacramento • Almost all homes are single-family homes with a few duplexes	• Over-mature, monoculture; dead, dying, diseased trees • Trees mostly same age • Increase canopy biodiversity • Maintain visibility of tree-planting program • Long-term NeighborWoods program; started addressing the issue over 20 years ago; canopy now in pretty good shape • Running out of planting spaces; focus on maintenance
Diamond Park	• One of the oldest neighborhoods in Sacramento • Disadvantaged community • Low homeowner-occupied percentage; high renter-occupied percentage	• Concrete jungle; not many trees, and a lot of concrete/asphalt • Urban forest not fully developed; in need of care • Lack attitude to care for trees • Community has other long-term needs • Incentives for long-term care of trees • Increase public services and trees in parks
Lancer Flats	• Recently incorporated city in Sacramento County • Older neighborhood in the city	• 'brown' landscape • No landscape plan • Not watering lawns and therefore trees • 'Nasty behaviors' • Neighborhood cleanup • Improve neighborhood beautification
Luna Park	• Built in the 1950s • Neighborhood in the city of Sacramento • Home to a large Hispanic and Latinx population • Family-friendly neighborhood; many young families and first-time homeowners; many households are multi-generational	• Below average tree canopy • Over-mature canopy; trees mostly same age • Dead, dying, and diseased trees; not being replaced all the time • Park rehabilitation and beautification • Create an event to engage neighbors of all generations in the park • Build relationships with neighbors
Fairmeadow	• Built in the 1950s • Stable, middle-class neighborhood in Sacramento near the local university and downtown • Most homes are single-family homes, accompanied by a few duplexes and apartment complexes	• Over-mature, monoculture; trees mostly same age • More than average tree coverage • Resources and interested community • A lot of lack understanding of tree care • Xeriscape landscapes; not watering trees; hit hard by drought • Improve stewardship of existing trees
Bloomington	• Built over time from the 1950s to the 1970s • Home to many working-class families • Safe neighborhood	• Immature canopy • Planting spaces mostly filled • Build consistent, prolonged engagement with partners

Rosemary Landing	• [NA; Leader did not describe the neighborhood during the interview and focused on the project and NeighborWoods]	•Immature canopy •Front yards lacking trees •Build collaborative partnership

The first neighborhood, Oak Village, is a neighborhood in Sacramento County desirable for its affordability. Neighbors include long-term elderly residents as well as younger mid-twenty to mid-thirty-year-old professionals and families. The urban forest in Oak Village "seems to line up with property values," states Opal, a previous community leader for the neighborhood, "There's a different distribution of people in the neighborhood, and the tree cover went along with that…[it] seemed to line up with more established homes." This follows trends that state urban greening patterns can be influenced by homeowner stability. Opal describes the inconsistencies in urban forest cover in Oak Village. While many streets are well-lined with trees, there are several streets utterly bare of trees. However, she claims there is some interest within the community to grow the urban forest. She recalls that while sitting on the neighborhood association, a county councilperson approached the group with a funding opportunity for a tree planting project and a community member's need to take it on. Opal immediately signed up for the job with two objectives: creating connections between the community and local businesses by increasing the tree canopy and improving neighborhood walkability.

Oak Village is flanked on one side by a street that was once a freeway—and people still drive like it is, very quickly. The neighborhood is very car-oriented and not walkable. Opal describes the tree planting project as an excellent opportunity to build inward and encourage the community to start walking or biking in the neighborhood to local businesses. She started the process by inviting anyone from the community to list how and why they value trees and posted the outcome to the neighborhood association website. When Opal began the project, she felt

confident that the neighborhood would support it: "I didn't have to sell it. It came from the community." A community that has a shared vision is vital to the sustainability of the urban forest.

Built in the 1950s, Floral Heights is also a desirable neighborhood in Sacramento County due to its relatively central location and close access to freeways and main hubs, like the local university and downtown Sacramento. Almost all homes in the neighborhood are single-family homes, with a few duplexes. Chris, Floral Height's long-term NeighborWoods community leader, believes the neighborhood's urban forest is currently in pretty good shape. However, this was not always the case. Developers planted Modesto Ash trees in every front yard when the neighborhood was built, providing a seemingly solid canopy of mature trees for the ensuing decades. Recent trends in urban forest management have encouraged an increase in biodiversity through tree species selection. Monocultures can often result in mass mortality resulting from factors that affect a single species of trees, such as pests, diseases, and climate change. Diversity in the age of trees also contributes to a more resilient urban forest. In the case of Floral Heights, the monoculture of ash trees planted simultaneously began to reach the end of its lifespan. Additionally, ash trees were subjected to topping in the 1970s and 1980s, and many were infected by anthracnose, a fungal disease, and mistletoe, a parasitic plant.

These poor management practices and disease infections led to shortened lifespans for the trees. Chris explains that a combination of all these factors led to a severe decline in the urban canopy by the nineties, which presented safety concerns as all trees were declining or dying at the same time. After Chris joined the existing NeighborWoods committee in his neighborhood, they organized a plan to save the dying canopy, focusing on increasing canopy biodiversity. In the first couple of years of the program, Chris claims the neighborhood was planting about 300

trees within a day or two. He explains, "In hindsight, we should have limited it to 100-150, spread out over a long period, but the need was so great, and people wanted it so badly." The tree planting program was able to target the neighborhood's needs and guide their focus on biodiversity. As one of the longest-running NeighborWoods program, they now have the advantage of seeing almost two decades of growth in their urban forest. Chris explains that while they still have an annual tree planting, they plant significantly fewer trees and are currently in maintenance mode.

On the other hand, Diamond Park is one of Sacramento's oldest neighborhoods and a designated disadvantaged community through CalEnviroScreen based on potential exposure to pollutants, adverse environmental conditions, socioeconomic factors, and certain health conditions. The neighborhood has a low homeowner-occupied percentage and a high renter-occupied percentage. The current NeighborWoods community leader, Farah, grew up in the neighborhood, developing an intimate knowledge of the local urban forest. While the urban forest in Diamond Park is not fully developed and needs care, Farah is delighted to see the growth. She explains that there is some interest in protecting and growing the urban environment. However, the dynamics of her neighbors' relationship with trees are complicated. Farah explains that "People in this neighborhood have immediate needs, and so they don't think about the long-term needs. And when you think about the urban forest, that's a long-term need."

Farah said her neighborhood is like a concrete jungle—not many trees, a lot of concrete and asphalt, with minimal attention paid toward environmental care and concern. She has witnessed neighbors taking out trees for many reasons: trees are too messy, they do not want to pay for continued maintenance, they cannot pay for ongoing maintenance, they need more parking spaces for their children, or they offer no reason and refuse to answer the question. Farah

speculated it might be due to a lack of resources, attitude, awareness, or education towards the value that trees provide. This creates a challenge because the neighborhood needs more trees, but the question of who will steward the urban forest long-term remains. The urban forest in Diamond Park follows inequitable tree cover trends in disadvantaged communities due to a historic lack of public investment. To achieve an ideal urban forest for Diamond Park, Farah believes that her neighborhood "would require incentives and resources for the entire lifecycle of a tree: beginning, during, and ending…there has to be a that long game, succession planting and planning that will provide the resources necessary for this community to probably even value those things."

As a neighborhood that has been historically left out of receiving public services, Farah has turned to the existing resources the community offers: parks. As a parks commissioner, she focuses on park equity and aims to maximize the number of trees in each park, but trees are only one piece of the equation. "Trees are cool, but from a park equity perspective, the parks need way more access to amenities to achieve real equity." At one point, the city approached the parks board and asked what they would do about the trees at a local park. Farah used this as an opportunity to turn the question back on them and asked, "Well, what are *we* going to do…? 'cause if the city's not planning for it or addressing it or concerned about it, but the community is, I can't be the sole person responsible." A collaborative partnership with the city is crucial for Diamond Heights to open communication about the stewardship of the trees.

To the east of Diamond Park sits Lancer Flats, located in a relatively recently incorporated city in Sacramento County. Claire, Lancer Flats' community leader, refers to her neighborhood landscape as 'brown.' While it is growing, Lancer Flats' urban forest is sparse and needs care. Still, Claire believes there is increasing interest in trees' value and shares that not having an

existing landscape plan hurts the neighborhood. Many of her neighbors, including herself, she admits, do not water their lawns, which translates to mean that her neighbors are also not watering newly planted trees or even older trees, and many are dying as a result. When Claire first retired, she began walking around her neighborhood with more frequency and could not stand what she saw: neighbors were parking on their lawns, leaving trash out on the street, and making other choices she refers to as 'nasty behaviors.' She feels these actions represent the poor mentality of her neighbors and signify poor neighborhoods.

Claire often finds herself wondering, "Why is the city allowing some behaviors in my neighborhood to continue?" Questions like these encourage Claire to be more engaged with her city to make the neighborhood cleaner and tidier. She began participating in street cleanings, going to city council meetings, and studying tree ordinances to draft what she felt would make a solid regulation to protect both trees and people. Her self-organized engagement suggests that she started to challenge her city to improve neighborhood conditions. While she was engaging in volunteer neighborhood cleanup activities, Claire was approached by the city's public works department and asked if she would be interested in conducting a tree planting in her neighborhood. Since she was already so involved in neighborhood beautification initiatives, she happily agreed.

In Sacramento, Adriana does not characterize her neighborhood's urban forest as sparse, but it is definitely below where it should be compared to the rest of the city. Luna Park neighborhood was built in the 1950s and is currently home to a large Hispanic and Latinx population. Like Floral Heights, many of the neighborhood's urban forest was planted at the time of development and is now simultaneously reaching the end of their lifespans. Additionally, a lot of the trees in the neighborhood are infected with mistletoe and diseases. However, unlike Floral Heights,

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Adriana states that these dead and dying trees are not being replaced all the time due to the expensive cost of tree work resulting in many sick and neglected trees in Luna Park. The neighborhood park is "very loved" by the community, says Adriana. Luna Park is a family-friendly neighborhood with many young families and first-time homeowners, and the park is essential to Adriana and her neighbors. The park is always used by people looking for exercise or taking kids to run off some energy.

When Adriana joined a small group of neighbors looking to get more involved with their community, they immediately focused their efforts on their beloved park's rehabilitation and beautification. The group conducted an informal survey by approaching people using the park and inquired about what they wanted to occur in the park and the neighborhood to benefit the community. "The park is important to the people. [We] decided to see what we could do there…and a tree planting was just an incredible way to start working on the park," said Adriana. The neighborhood group initiated contact with their local council member's office to request trees and other resources to help with their park's rehabilitation. They were then connected with SacTree and began planning. One of Adriana's main goals for the tree planting event beyond improving the tree canopy in the park and neighborhood was "to have an event that would bring neighbors out of their house together in the park…and do something really proactive, positive, and fun to get to know each other and to build relationships with neighbors." Since Luna Park is family-oriented and many households in the neighborhood are multi-generational, it was important for the group to have an event that would engage all generations around something they could all participate in.

Annie, the next NeighborWoods community leader, lives in Fairmeadow, a stable, middle-class neighborhood near the local university and downtown. Most of the homes are single-family

homes, accompanied by a few duplexes and apartment complexes. Compared to the rest of Sacramento, Annie explains, Fairmeadow has more than average tree cover and a very interested community to complement it. While many people understand the value trees provide their neighborhood, Annie claims many of her neighbors do not understand the importance of tree care even though they have the means and resources to provide quality care.

Like Floral Heights and Luna Park, Fairmeadow was first developed during the 1950s, and many trees were planted simultaneously, including a high number of Modesto Ashes. Additionally, California's recent drought led many people in the neighborhood to relandscape their homes using the xeriscape method, a landscape design that requires little irrigation or maintenance. Much like the Lancer Flats neighborhood, many people have stopped watering their yards, and subsequently, their trees. In combination with an aging population of trees and a lack of understanding of tree care, the trees in Fairmeadow have been hit hard by the drought. Confronted with this challenging issue, Annie approached her neighborhood association board with two goals: to start a tree planting program in the neighborhood and address how to improve the stewardship of existing trees. The Fairmeadow Neighborhood Association was on board, and a committee was immediately formed. The group approached SacTree and began planning a tree planting event and other educational activities targeting stewardship.

While many previous respondents believe their urban forest would benefit from new trees, Harvey from Bloomington believes his neighborhood does not need any more trees. The neighborhood is covered in trees and other vegetation everywhere you go. Harvey moved to the neighborhood about a decade ago and believes the neighborhood feels very safe and that the trees are part of what makes Bloomington a great place to live. Over time, the neighborhood was developed from the 1950s to the 1970s and is currently home to many working-class families.

One of the main things the Bloomington urban forest needs is time. Most of the trees planted around the neighborhood have occurred within the last twenty years; they are relatively young and short, not yet providing a mature tree's benefits, such as shade. "It's still young in comparison to these older neighborhoods around Sacramento…it's nice to drive around those older areas and the sun [is] not striking down on you as hard as it gets in some areas around [our neighborhood]."

Harvey plays a vital role in the neighborhood association and has been actively engaged in his community since he first moved there. He has a passion for providing services to his community like accessible public transportation, community gardens, and neighborhood beautification initiatives through volunteering efforts and his neighborhood association role. While the neighborhood may not require many trees, Harvey believes the community would benefit from consistent, prolonged engagement from the NeighborWoods program. After many failed attempts (on both sides) to connect with a SacTree representative in the past to plan tree plantings, the neighborhood began to feel as if no one would commit themselves to the project. As the trust began to erode, the neighborhood started to question the organization's motives. However, when the newest SacTree Neighborhood Representative began community outreach, confidence began to be fostered, leading to the community's first tree planting event, which Harvey claims were a huge success. Harvey and SacTree now meet regularly.

Like Bloomington, Rosemary Landing has many relatively young trees that need some time to grow and develop into a mature tree canopy. Mike, a community leader for Rosemary Terrace, describes the neighborhood front yards as "fairly boring lawns…without much to fill the tree canopy" while backyards seem to be filled with trees. He believes that parking lots, parks, and roadways also need trees in addition to front yards. Luckily, the tree planting events in the

neighborhood are always extremely popular; Mike often has to turn away volunteers. Mike's primary goal when he first reached out to SacTree was to form a connection and utilize the resources they offered. A collaborative partnership has been developed, and they have successfully held many tree plantings in their neighborhood. Rosemary Landing proves that working together to employ the necessary resources serves as an example of a successful cross-sector partnership.

Although the needs and goals may vary between neighborhoods, each leader has a shared purpose of serving as the voice for their community's urban forestry needs. Interviews reveal critical commonalities in the personal connection leaders have to their neighborhood and the work they conduct for their communities (see *Table 3*). Results point to similarities in the motivations, personal connections, and collaborative leadership styles amongst the leaders. Results show that the NeighborWoods model of connecting with a community leader has opened the doors for community members to join planning conversations. Leaders have been engaged in their community and have an intimate knowledge of local issues. They also offer unique connections and skills that benefit their community, and many are looking to inspire others to take on leadership roles.

Table 3: Community leadership themes developed through community leader interview data

Community Leadership Themes	Community Leader Interview Data to Support Theme
Actively engaged in community before connecting with SacTree	• 2 parks commissioners • 4 neighborhood association board member (1 president) • 2 active members of volunteer groups • 2 running for elected office (at time of interview) • One neighborhood formed neighborhood association following tree planting
Activities community leaders involved with	• neighborhood clean-ups • neighborhood beautification • neighborhood watch • attending city/county council meetings • drafting tree ordinances • improving walkability • public transportation initiatives • environmental and social justice initiatives

	• public health • local business development • increase property values • tree canopy development • stewardship
How community leaders were connected with SacTree	• 2 leaders approached by local government while on boards or committees • 3 leaders approached by SacTree while on boards or committees • 1 leader approached by city while volunteering • 2 leaders approached local government or neighborhood association
Goals for connecting with SacTree	• saving and increasing a dying canopy • creating connections within the community • increasing access to public amenities like parks and public transportation • bolstering walkability and neighborhood beautification • network building • increasing representation and control for neighborhood residents

Inspiration for civic action	• 6 refer to early childhood experiences
	  ○ 3 mention parental figure
	  ○ 2 mention school programs
	• 2 refer to growing up in neighborhood
	• 3 refer to experience living in neighborhood

Benefits community leaders see from the urban forest	• Aesthetics • Air quality • Overall quality of life • Oxygen production • Carbon sequestration • Connects with multi-modal transportation initiatives • Habitat creation • Stormwater management
Importance of shade provision	• All leaders feel urban forest makes cities livable • 6 leaders compare shade inequities to more affluent communities
Issues of power and control that affect leaders' neighborhoods	• 4 leaders brought up issues of power and control in their neighborhoods • 2 leaders with backgrounds in social justice—channel into projects • City operates under fear-based planning; excuse not to provide services • City doesn't address issues in all neighborhoods • Don't trust the city • 4 leaders continue to push against systems

Collaborative and situational leadership style	• 5 leaders' style did not change—all have leadership experience
	• 3 leaders' style changed
	  ○ initially took on a lot of responsibility, then delegated
	  ○ all formed committees
	• 6 leaders use a collaborative leadership approach
	• 4 leaders use situational leadership or inquiry-based leadership'
	• 3 lead by example
	• 2 leaders gauge incentives

Personal growth/attachment to project	• Tree guy, tree girl, original tree hugger • Special place in heart • Part of identity • Five reported increased confidence in leadership abilities • Two reported their project strengthened voices • Project role led two to take on other leadership roles confidently • Role gave confidence to be an effective leader for one • Role helped propel into public service and aspirations for local elected office
Community leader connection to place	• Five leaders fostered connection to neighborhood • Two leaders got involved to feel more connected after moved • One feels more integrated and attached after involvement • 2 leaders feel more connected to like-minded individuals

	• 3 leaders enjoyed project that was meaningful to community and could see progress
Identifying and training new people within community to take over leadership role	• 4 leaders stress importance of letting other take leadership roles and include more voices • 2 leaders hope to pass on role soon to grow and evolve program • One leader has since moved; allowed another leader to step up • 2 leaders say community needs more opportunities for more voices in to be heard
Connection of what actions they are participating in now and how that will benefit future generations	• 5 leaders stress importance to think about future generations when planting trees • 5 leaders stress importance to involve kids in activities • 'our legacy' • 4 leaders experienced watching kids connect to nature

All eight community leaders were actively engaged in their neighborhood before their connection with SacTree began, highlighting a common theme among the community leaders. There are two park commissioners within the group, four neighborhood association board members—one of whom is president—and two members of other neighborhood volunteer groups. At the time of interviews, two of the community leaders were running for local elected offices. Following their self-organized efforts for the tree planting, Adriana (community leader from Luna Park) and her neighborhood volunteer group have since formed a neighborhood association. These community leaders have been involved in varying but similar activities that benefit their neighborhood: neighborhood clean-ups, neighborhood beautification, neighborhood watch, attending city/county council meetings, drafting ordinances, improving walkability, public transportation initiatives, environmental and social justice initiatives, public health, local business development, increase property values and of course, tree canopy development and stewardship. The commonality of leaders' involvement in active community groups either suggests SacTree and local government target a particular process to find leaders or that a specific type of person is most drawn to the role.

Almost all leaders were connected to SacTree and the NeighborWoods program through their involvement in other local initiatives, activities, and positions. For example, two leaders were

approached by local government offices (i.e., the city parks department and the county council office) while holding board or committee positions. Similarly, two leaders were approached by SacTree while holding board or committee positions. One leader was approached by a city department while heavily involved in neighborhood volunteer activities. Two leaders took the initiative and approached their local government office or neighborhood association to ask for more trees, while one joined an existing NeighborWoods group. However, the leaders were connected with SacTree, and it is clear they were already engaged within their community.

Significantly, six out of eight community leaders reference early childhood experiences as the reason for their engaged levels of civic activity. In particular, three leaders mention a parental figure who was always giving back to the community and instilled civic activism at an early age, with all three saying something along the lines of 'I don't know any other way to live.' Two refer to their involvement in high school and junior high school environmental groups that led to their growing interest in environmental activism. These results are crucial when considering how to instill leadership in civic action and the importance of engaging kids and young adults in urban forestry efforts. Two leaders grew up in the neighborhoods in which they currently live and serve, and three suggest that their experience living in their current neighborhood is why they became actively engaged.

All leaders unanimously agree that the urban forest is an asset to Sacramento (this is not surprising given their leadership in urban forestry efforts). Each leader referenced aesthetics, air quality, and overall quality of life as essential benefits from the urban forest. Other benefits listed include oxygen production, carbon sequestration, the connections to multi-modal transportation, habitat creation, and stormwater management. One central common theme amongst the leaders is shade provision and climate change adaptation. All eight leaders feel the presence of an urban

forest shapes the perception of whether a community is "livable versus not livable," or "habitable versus uninhabitable," or "comfortable versus suffering." As Farah from Diamond Park states, "an urban forest means searching for shade on a hot summer day." Six of the leaders compared their neighborhoods' differences to the livability, aesthetics, and general feel of older, more affluent communities in the Sacramento area with well-developed canopies, creating questions around equity in urban forest resources (reported below). Opal from Oak Village states that when she thinks of the urban forest, she thinks of "the symbiosis of people taking care of trees and trees taking care of the people." Similarly, Claire of Lancer Flats believes the urban forest should reflect neighborhood development "created by them, for them, and for their future." Two leaders stated that ideally, they want to provide at least one tree for every house.

During interviews, four community leaders brought up issues of power and control that affect their neighborhood. In particular, two leaders with professional backgrounds in social justice both spoke of striving to push against systems of power to improve the standard of living for the economically disadvantaged and those historically left out of the conversation. One of the leaders observed that their city operates under fear-based planning, claiming the city did not want to plant trees in a transient area stating they would be vandalized. However, this leader pointed out that "that thinking will get us nowhere" and is instead an excuse not to provide quality public services. Another leader stated that their city has a tendency to say a lot of beautiful things about their work and new developments but does not address all neighborhoods, particularly ones that need help. Additionally, one of the community leaders said they do not trust their city to protect trees and believed they are "all too willing" to take them out. However, these leaders commonly expressed that they continue to push against these systems to address

their neighborhood issues and engage in constructive, positive action rather than fear-based planning.

Although many leaders were already involved in urban greening efforts before connecting with SacTree, there were varying leadership experience levels, particularly with volunteers. Five leaders reported that their leadership style did not change throughout their project—these leaders have had leadership experience before their NeighborWoods projects. The other three leaders, however, state that their leadership style has evolved throughout the project. Initially, these three leaders similarly took on most, if not all, the work required to plan a tree project. Either from SacTree's suggestion or their realization, they began to delegate work to other interested volunteers. As a result, these leaders formed committees around planning tree planting and educational events in their neighborhood, all of which are still actively engaged. Six leaders described their style as a collaborative approach, including the three leaders whose style had evolved. These leaders reported that although they brought the group together, they encourage information and idea share from all interested parties and shared responsibility for the whole. Three leaders even reported finding joy in letting others step up and find their strengths through the process, claiming they step back and do more listening than telling.

Additionally, four leaders expressed their leadership style as situational leadership or inquiry-based leadership. As one leader stated, "you have to meet [volunteers] where they're at." Understanding that volunteers are donating their time and have varying levels of experience, these four leaders mentioned they make no assumptions regarding volunteers' skill set, experience, and motivations. Instead, they adapted their approach to meet the needs of their volunteers. Through this approach, two leaders also attempted to gauge what incentives are needed to motivate volunteers and overall stewardship of trees. Three leaders also found that

leading by example is essential—seeing the leaders actively engaged and asking others to help

encourage the volunteers. As Harvey states, this is especially important for being a role model

for the younger generation. Although very active in his community, one leader reported that

when it comes to the NeighborWoods tree plantings in his neighborhood, his only role is

marketing the event and recruiting volunteers from his existing listserv. Beyond that, he does not

do much to engage volunteers or involve them in the planning process. This leader also admits

that he cannot easily distinguish NeighborWoods activities from his other civic responsibilities

or tree planting efforts.

All eight leaders reported their involvement with community tree plantings was very

meaningful in some way. One leader is now referred to as the 'tree guy' in his neighborhood, and

another leader is the 'tree lady'—both of whom are contacted by community members with

questions about trees. One of the leaders refers to herself as 'one of the original tree huggers.'

While one leader states that trees hold a special place in her heart, another leader claims that

trees are now part of her identity. Five leaders reported that their role as a community leader had

given them increased confidence in their leadership abilities—two have claimed it has

strengthened their voice, mainly when speaking up to identify community needs. Two said their

leadership role had led them to assume other leadership opportunities confidently. One stated

that her role as a community leader had given her confidence in being an effective leader. One

leader also claimed that their involvement in the tree program has propelled them into public

service and led to local elected office aspirations.

A key result developed by the community leader position is a feeling of connectivity to place,

with five leaders claiming their leadership roles have fostered a connection to their

neighborhood. Two leaders claim their community activity involvement was initially to feel

more rooted and connected to their community after moving into the neighborhood. One leader reflected on how tough it was to engage with her community as a working single mom, yet her experience as a leader has allowed her to feel more integrated and attached. Two leaders believe their experience has allowed them to share their passion for taking care of the environment and their communities with like-minded people. Three leaders expressed how meaningful it is to see how their projects have benefitted the community, particularly when they can see the progress they have made.

Many leaders expressed the importance of identifying and training new people within their communities to come forward and fill the NeighborWoods leadership role. Four of the community leaders stressed how important it has been to allow others to assume leadership responsibilities in their neighborhood. They acknowledged that as leaders, they have their ideas and methods that have shaped current urban forestry efforts, but there should be more voices and different ideas to foster representation in the process. In particular, two of the leaders expressed that they hope to soon pass on the NeighborWoods role to someone new who can grow and evolve the program. Another leader has since moved out of state after starting a neighborhood committee to organize educational events and tree plantings. However, they expressed it allowed others to find their strengths and look for additional resources. Two of the leaders described how important it is for others in their communities to rise and lead; as marginalized communities, they need more voices and opportunities to be involved.

Another common theme among leaders was the connection of what actions they are participating in now and how that will benefit future generations. While trees may take a few decades to reach maturity, five leaders discussed how important it is to think about future generations while planting trees. As one leader stated, "It's not about us…it's the children, their

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children [and] the next seven generations to come." These five leaders also mentioned how important it is to involve kids in tree plantings, mainly to instill a sense of collective responsibility to improve their communities. One leader referred to this idea as "our legacy." Four of the leaders recalled the joy in providing that experience for kids and watching them connect and take ownership of the environment and their community.

With each unique neighborhood comes varying exiting capacity levels, which alters the outcome and level of independence programs have to address urban forestry needs. While some neighborhoods lean heavily on the support from SacTree, others have organized to conduct a majority of tasks with limited backing from SacTree. This, in turn, defines where a neighborhood lies on SacTree's "Spectrum of Participation" (See *Figure 3*). Results also suggest the level of capacity has been altered through the NeighborWoods program's efforts (See *Table 4*).

Table 4: *Capacity building themes developed through community leader interview data*

Capacity building themes	Community Leader Interview Data to Support Theme
Unique skills and backgrounds brought to projects	• 1 leader works for conservancy agency; understanding of maintaining habitat and reduce human impacts • 1 leader worked for local utilities; understanding of tree program; connections • 1 leader professional grant writer and grew up in neighborhood; grant opportunities for neighborhood • 2 leaders with social justice background; channel into projects • 1 leader worked for local elementary school; connected to kids • 2 leaders retired; free time to dedicate to project
Group work to conduct projects	• 3 leaders formed neighborhood groups to plan events • 1 neighborhood group evolved into neighborhood association following tree planting • All 4 neighborhood groups still active; meet regularly • 4 leaders operate planning under existing volunteer groups or through role on local board • 1 group renamed themselves; independent group for tree stewardship; team building • 1 group uses mascot and theme • 4 leaders express benefits of group members with different skills to benefit project • 5 leaders feel group work has built relationships; feel more personally connected to their neighbors and community • 1 group organized around other neighborhood issues when needed
Methods and resources to recruit volunteers and market program	• Varying levels of engagement in recruiting volunteers • Social media, other online platforms • Community newsletters • Flyers • 1 leader moved away from physical marketing with rise of social media • 'unintentional outreach' when in neighborhood passing out flyers • 1 leader speaks at community meetings and tables at events to find volunteers and market program

Community interest and energy a resource for the project	• 3 leaders felt community interest and energy are resources for project • 2 leaders invite local groups and organizations to table at events • Neighborhood associations and other local groups supportive • Some community groups provided mailing services, expert advice, printer services, venues • 3 leaders connect with other neighborhoods to help them plan events
Local groups connected with	• Americorps volunteers • Boy Scouts • Hands-On Sacramento • school kids who need public service hours • local garden clubs • high school clubs • League of Women Voters • The local library • SMUD • Local non-profits
Financial resources and donations for projects	• 3 neighborhoods received state or county-funded grants • Financial contributions from neighborhood associations, the Arbor Day Foundation, PG&E, California ReLeaf, One Tree Planted, local businesses, city council members, individual contributions • 1 leader did not ask for financial support (lack skill) • Food donations from neighborhood association, city council's office, Boy Scouts, the garden club, grocery stores, Starbucks, and local businesses; 2 leaders use their funds for food
Connected with local government office or individuals to support project	• All leaders associated with local government offices or individuals to support projects • Departments and roles connected with county officials, law enforcement agencies, city and county council persons, city staff, city arborists, department of transportation, department of parks and recreation, business districts, and the parks and recreation district • 2 leaders stress importance of local government official to navigate bureaucratic systems • Can be difficult to come to consensus with partners
Developed relationship with SacTree	• All leaders reference SacTree as critical resource • Provide tools, trees, expertise, logistic support, leadership support, volunteer community • 1 leader states SacTree was flaky in the past; now well-connected • 4 leaders say SacTree leadership and neighborhood representative encouraging, supportive, and creative • 1 leader took over leadership role to repair relationship with SacTree • Volunteer community very supportive; 1 leader wanted more of neighbors; 1 leader likes to invite outside volunteers to neighborhood
Varying levels of involvement with SacTree	• 1 leader only gathered names for people who want trees, SacTree did the rest for first project; leader has since increased involvement • 2 leaders relieved when SacTree knew where to find resources and contacts • 1 leader felt they would find resistance if SacTree didn't approach the city for them • Leaders with more established neighborhood groups say SacTree's role is mostly expertise and tool provision • Many leaders value SacTree's availability for advice, ideas, and general support; especially when first organizing • 1 leader's group is a 'well-oiled machine' in planning; have taken on most responsibilities
Importance of NeighborWoods Community	• All leaders think "NeighborWoods Leadership Summit" and periodic NeighborWoods community leader meetings great opportunity to connect • Meet, connect, share ideas, support each other, provide an optimistic outlook • Opportunity to learn more about social justice and other communities, practice leadership skills, build public speaking confidence • Events have created a community of leaders

Each community leader offers unique skills and backgrounds that have provided varying resources and support to their communities, influencing their neighborhood's capacity. As Farah states,

> "I have all this beautiful opportunity; how do I leverage this role and responsibility that I have now? …I feel like not only my role as a community leader but now having a seat at the table…I was really able to be the voice for the community to raise those concerns."

One leader worked for a conservancy agency and stated this career path gives them a unique understanding of what it means to maintain a functioning habitat and reduce human impacts. Another leader has previously worked for SMUD, which provides the free trees for the Shade Tree Program and subsequently the NeighborWoods program—their experience provided them an intimate knowledge of the tree program and created relationships that were tapped into during event planning. As a professional grant writer, one of the leaders offers technical expertise and a strong community resident perspective, having grown up in the neighborhood. This skill has brought the necessary financial resources for projects within the area, and the success of this grant subsequently led to their involvement in securing another grant for the neighborhood. This leader was one of two who work in the social justice field and focus on policy and advocacy for marginalized groups, and both of these leaders connected this passion to their tree planting efforts in their neighborhood. One leader previously worked at a local elementary school and often thought about these children while improving the neighborhood. Two leaders are retired and dedicate their free time to improve their neighborhood and quality of life.

A typical result from interviews reveals group work as a crucial component to build community and accomplish tasks. As mentioned previously, Opal, Chris, and Annie all formed NeighborWoods committees to plan tree planting and educational events in their neighborhood.

The neighborhood volunteer group in Luna Park has evolved into a designated neighborhood association following self-organized efforts to accomplish their event. All four of these groups are still actively involved, meet regularly, and have multiple members. The four other leaders operate their events through existing volunteer groups or through their role on the neighborhood association or other board seat—only one of which, Claire, mentions utilizing a neighborhood group to help plan events. Members of the Oak Village tree committee voted on a new name for the group. Opal shares that with their own name, the group now has a separate identity outside the Neighborhood Association, which aids in team building. Since the group and their activity were so popular, they created their own website and brand all their events with the new name.

Similarly, the group in Luna Park decided on a mascot and a theme for their tree plantings. Four leaders expressed the benefits of group members with different skills and connections to benefit the group—specifically, leaders mentioned examples such as graphic design skills, strong ties to schools or businesses, organizational skills, arboriculture knowledge, and irrigation repair skills. Five leaders said that group work has built relationships over collaborative efforts and now feel more personally connected to their neighbors and community.

In one instance, a tragedy that rippled throughout a community encouraged the growth of collaboration between neighbors. Opal described a tragic story of a child and his grandmother struck by a car while crossing a street in the neighborhood where a crosswalk had been recently removed. While the grandson was placed in critical condition, the grandmother did not survive. People in the community were outraged and did not know what to do. Opal explained:

> "But because we had already had this model of coming together around the trees, a lot of the people who were serving on the tree committee went on to help form the committee that started working to improve the conditions of [that street]. They started getting together and meeting and trying to advocate for another crosswalk. And they came to make a lot of the same contacts. So they were interacting with

the city, they were making small groups. These people had come in and developed these skills and brought it and applied it directly to another project."

The community leaders tapped into many different resources to recruit volunteers, market events, and fund activities. The level of active engagement was variable, with a few leaders primarily utilizing online marketing methods while others conducted door-to-door flyering or spoke at community events. Most leaders used social media and other online platforms—like NextDoor, Facebook, Instagram, Neighborhood Association websites, etc.—and various community newsletters to recruit volunteers and market events. Additionally, most leaders also passed out flyers in their neighborhoods. Chris described how their neighborhood's marketing has changed since the beginning of their NeighborWoods program. Twenty years ago, the neighborhood relied on flyers, signs posted in yards, and other physical marketing methods; they have since moved away from that with social media prevalence in recent years. Chris admitted that it might be less effective without signs to catch the neighborhood's attention, but still successful. Opal used the term 'unintentional outreach' to refer to spontaneous opportunities to engage with neighbors while handing out flyers in the neighborhood. Annie has taken opportunities to speak at varying community group meetings about their efforts and often tables at neighborhood events.

Another typical result revealed that a supportive community and local support groups were a crucial component for projects. Three leaders emphasized how community interest and energy toward projects are a significant resource for the neighborhood. Specific groups the leaders connected with for volunteers include: Americorps volunteers, Boy Scouts, Hands-On Sacramento, school kids who need public service hours, local garden clubs, and high school clubs. Opal and Adriana both mentioned inviting local groups and organizations to table at the

tree planting potlucks, including The League of Women Voters, the local library, SMUD, and local non-profits focused on multi-modal transportation and other green initiatives. Neighborhood Associations were commonly acknowledged as an excellent resource for both their financial support and general support of leaders' work. Other resources leaders mentioned include mailing services from SMUD, expert advice from the garden club or knowledgeable individuals, printer services from a nearby business district, and providing venues for educational events. Harvey, Chris, and Mike all remarked on their connections with other interested neighborhood associations—all three recall other cities and neighborhood associations observing their tree planting efforts and have since connected to SacTree and implemented their own events loosely based on theirs. Chris also proactively meets with other communities and neighborhoods to describe tree planting efforts and encourage others to adapt their own program. NeighborWoods projects' success has attracted other organizations to the program seeking a similar community engagement method.

Additionally, each neighborhood's financial resources and donations varied but reveal outside support for urban forestry initiatives. Three neighborhoods have received state or county-funded grants. Leaders have also received donations from neighborhood associations, the Arbor Day Foundation, PG&E, California ReLeaf, One Tree Planted, local businesses, city council members, and individual contributions. One leader admits they are not good at asking for money and had no funding opportunities to share; similarly, two leaders did not mention financial resources when requested. This suggests a potentially higher capacity to conduct activities if the neighborhood's financial support is not needed, although this is unclear.

Food was a common theme amongst community leaders: while two leaders provide food for volunteers from their own pocket, the other six leaders receive donations from various sources.

These sources include the neighborhood association, city council's office, the local boy scout troop, the garden club, grocery stores, Starbucks, and local businesses. Adriana describes how culturally important it is to provide food for volunteers in her neighborhood: "We have a large Hispanic and Latino population, and you don't invite people to your house without feeding them. So it was important."

An essential commonality between all eight leaders is their connection with local government offices or individuals to support their tree activity. Specific departments and roles mentioned are county officials, law enforcement agencies, city and county council persons, city staff, city arborists, department of transportation, department of parks and recreation, business districts, and the parks and recreation district. While some of these departments and individuals provided monetary support, many leaders expressed how integral local government support is to their efforts. Both Adriana and Farah explained how a local government official committed to the neighborhood is invaluable in navigating the bureaucratic systems and structures to push things forward. A city councilperson for Luna Park has a family history in the neighborhood and understands its culture. He is very invested in environmental justice issues and supports strong community leadership initiatives. Farah similarly explains how a city arborist's commitment and attitude was crucial in navigating the bureaucratic system to push things forward to secure dedicated funding and ensure the city is doing all they can to support their efforts. She goes on to explain why this connection is so crucial to the program:

> "I think that's why the NeighborWoods program has been so successful…me by myself, I'm only going to do so much; the tree foundation by themselves, they're only going to do so much; and the city, they can only do so much either. So that's why having all three partners at the table and pushing these efforts is the only way to create that ideal urban forest."

However, a few of the leaders describe the difficulty in coming to a consensus amongst partners. One leader says this can often be a struggle as "our systems aren't designed to share power, control, or resources with communities like mine." They state by facilitating conversations and allowing everyone to voice their concerns, and they can come to some agreement where everyone is still committed to completing the project.

Not surprisingly, all leaders call out SacTree as a crucial resource for their neighborhoods. While a few have had sustained relationships with SacTree, a couple of the leaders had not even heard of the tree foundation before their NeighborWoods program involvement. However, they are all in agreement, the resources SacTree provides—tools, trees, expertise, logistic support, leadership support, volunteer community, etc.—are critical for their community projects' success. Although Harvey described SacTree as flaky in the past with inconsistent attempts to connect, the neighborhood now has a very supportive representative who remains committed to their efforts. The SacTree Neighborhood Representative has taken great strides to stay connected and build back some trust, but Harvey hints the past has not been forgotten. However, Harvey and three others specifically call out SacTree leadership and their neighborhood representative and as encouraging, supportive, and creative. Oppositely, Chris describes how he took over leadership of the neighborhood tree planting group from a leader whose lack of interpersonal skills was threatening to sever the relationship between SacTree. In this case, he stepped in to repair the damaged partnership and has since built a robust and definitive partnership.

While all the leaders expressed the SacTree volunteer community was a great support system for their projects, Claire wished more of her neighbors were involved. However, Adriana believes outside volunteers are very favorable for their neighborhood: "You have people from

outside the area that comes to your neighborhood, and you're like, 'Hey, this is where we live. Welcome.'" Adriana expresses their events typically see a good mix of outside volunteers and neighbors.

The level of involvement with SacTree was variable amongst neighborhoods. One leader states they did not do anything more than gather names of neighbors who want trees during their first tree planting, and SacTree did the rest. They have since increased involvement in recent years. Two leaders recall feeling relieved when SacTree knew where to find resources and who to contact within the city—mainly when one leader knew they would discover resistance if they approached the city themselves. Other leaders who conduct events with more established neighborhood groups state that SacTree's role is mostly expertise and tool provision. However, many leaders describe SacTree's availability for advice, ideas, and general support as necessary, mainly when first starting to organize. After twenty years, Chris, from Floral Heights, says his team is now a well-oiled machine in planning their annual event and has taken on most of the responsibilities SacTree used to handle. Overall, whatever level SacTree's involvement is, each neighborhood feels their support is crucial.

All of the leaders agree on the importance of gathering with other NeighborWoods community leaders to support each other and explore ideas. In 2019, SacTree began hosting an annual 'NeighborWoods Leadership Summit' where community leaders and interested citizens from throughout the Sacramento region come together to workshop and discuss how to grow healthy, livable communities centered around the urban forest. The leaders have identified the NeighborWoods Leadership Summit and casual NeighborWoods community leader meetings as great opportunities to connect to other neighborhoods and explore ideas to improve their programs and overall quality of life. As a few leaders put it, these events have created a

community where leaders can meet, connect, share ideas, support each other, and provide a more optimistic outlook. It has also been described as an opportunity to learn more about social justice and other communities, practice leadership skills, and build public speaking confidence. Adriana describes the benefits of gathering community leaders together:

> "[C]ommunity organizing is not for the faint-hearted, and we need to support one another and lift one another up and encourage one another when we're doing this work because it can get frustrating and discouraging…you feel like you're beating your head against the wall sometimes and so when you get [together] with people that are doing the same thing, and sometimes they have the same issues, and you can encourage one another and share resources and ideas, it's really important."

Additionally, Claire explains her strong connections with other supportive leaders in the NeighborWoods community:

> "I think I could call on them and say, 'I need your help.' I bet you money they would come out and help me. So that has meant a lot to me. I think they'd show up for me, and I would show up for them."

The networking opportunities and other connections offer leaders critical support to strengthen their efforts.

The complexities of urban forest stewardship were highlighted in community leader interviews. Ideally, the NeighborWoods program aims to improve urban forest stewardship through locally-initiated tree planting efforts. Leaders still reported uncertainty in tree care regimes and a lack of programmatic structure to support efforts. *Table 5* summarizes the data of stewardship themes resulting from community leader interviews.

Table 5: Urban forest stewardship themes emerged from community leader interview data

Urban Forest Stewardship Themes	Community Leader Interview Data to Support Theme
Positive program outcomes for stewardship and ownership	• Many leaders found sustained annual event builds community and keeps community engaged in efforts • Neighbors see changes; see trees in ground • Neighbors can participate in efforts; can benefit from urban forest

	• Neighbors excited to see community needs met; some being thanked • Local real estate referring to tree canopy and tree program as selling-points
Negative impacts on stewardship and ownership	• Poor attitude toward environmental care in 1 neighborhood; lack resources, awareness, or education • Some trees vandalized in 1 neighborhood; snapped in half; leader fears it may affect future plantings • Some neighbors need instant gratification • Economically disadvantaged neighborhoods need help maintaining trees • 1 neighborhood program not as big with fewer planting spaces and less visibility; leader fears it may affect stewardship and engagement
Community leaders engage with community to increase stewardship and ownership	• Few leaders say important to stay connected/been involved with neighbors • 1 leader takes walks to find moments to engage with neighbors • 3 leaders continue to put out marketing for stewardship • Importance of instilling ownership in homeowner through participation • Importance of investing ownership in kids through participation • 1 leader encourages a neighbor to channel guerilla planting into appropriate process
Tree maintenance activity after plantings	• Host educational workshops and activities in community • Host community bike ride and tree tour • Pruning clinics • Involvement in other related groups • Engaged in protecting trees from development • Stump removal and removal of dead trees; opening up new planting spaces • County more aware of issue; now being proactive • Independent tree plantings in neighborhood • Increase in advocacy for neighborhood
Lacking tree care maintenance regimes in neighborhoods	• Leaders believe tree care is dependent on who owns the tree; does not mean care is happening • All wish they had more capacity for tree maintenance regimes • Some leaders do limited follow-ups and offer assistance • Uncertainty if partners following up on tree care • 1 neighborhood engaged in 'mismanagement' of trees • 2 leaders remark neighborhood does not have long-term strategy • 3 leaders request a system or program to address care • Suggest SacTree develop internship program for need • Need more incentives to address lifetime stewardship
Concern for COVID-19's effect on program	• All leaders concerned about the effect of COVID-19 on program • Activity suspended, gathering discouraged • Concerned gap in annual plantings will affect momentum and visibility of program • Concerned gap will affect new leadership search • Concerned community will lose moments to engage and network with each other • Concerned about tree mortality if people cannot go into work to care for trees • COVID-19 forces leaders and community to be creative • Concerned COVID-19 is affecting leadership abilities • Concerned tree efforts will be forgotten due to new, more pressing concerns • Concerned about delays in new initiatives

Several leaders reported positive changes in community stewardship and ownership for the urban forest following NeighborWoods projects. Many leaders have found a sustained annual event is not only a perfect way to build community, but it helps keep the community engaged. As one leader explains, once people knew there was an annual tree planting, the number of

volunteers increased. The NeighborWoods programs that have been active for multiple years now have what one leader calls 'a track record' of putting trees in the ground—neighborhoods see changes. They can now not only participate in these efforts but also be beneficiaries of urban forest resources. One of the leaders tells a story of a friend who called one of their neighborhood parks 'the worst park in the city' and claimed she would never go there again because there were absolutely no trees or shade to protect her children from the summer heat. Subsequently, this leader held a tree planting event at the park, and the friend noticed—she was excited and surprised to see issues being resolved in the community. Chris states he knew the program was making a difference in their neighborhood when local real estate agents began advertising Floral Height's tree canopy and the tree program as valuable selling points for potential clients. Mike mentioned an outpouring of appreciation from their neighborhood for their efforts when the success was shared on social media; Farah similarly shares community members approached students planting in the park and thanked them. She also thinks the tree plantings have increased the appreciation for nature and action in the community.

Although projects have had positive stewardship outcomes, leaders reported varying levels of urban forest stewardship within their communities, including negative impacts. As mentioned before, Farah from Diamond Park struggles with the flippant attitude toward environmental care in her neighborhood. She speculates it may be due to a lack of resources, attitude, awareness, or education towards the value that trees provide. Similarly, trees planted during NeighborWoods events in Luna Park were vandalized and snapped in half—even after they were replaced, another vandalization occurred. For Adriana, she does not understand this destructive behavior and fears it may impact further planting efforts. Adriana similarly struggles with poor attitudes in her community towards trees as people generally expect instant

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gratification. However, Adriana explains that since trees are a long-term invested commitment, economically disadvantaged neighborhoods need help maintaining trees to understand and value them.

Although Floral Heights has seen a dramatic improvement in rebuilding the tree canopy over the last two decades, Chris has observed a decline in neighborhood participation. The program plants significantly fewer trees than in earlier years and has started to run out of places to plant, resulting in fewer chances or need to participate. Thus, he feels the program has become less visible, and there are fewer depths of knowledge about the program throughout the neighborhood. Chris fears a negative consequence would result in less neighborhood urban forest stewardship and engagement.

A few leaders also bring up the importance of staying connected with neighbors to keep them engaged and encourage further participation. One leader states they often take walks to find moments to engage with their community and encourage their participation. She often tries to explain to her neighbors that they do not have to run for city office to be proactive in their community and explains how little effort it requires—just small actions toward a goal. Three other leaders also explain efforts to garner support for the urban forest through social media, community newsletters, websites, postcards, tabling, and speaking at community events. Messaging often includes the value trees bring to their neighborhood, management and maintenance tips, and references to SacTree resources.

A few of the leaders describe changing tactics with homeowners and their trees to increase ownership. The first year, volunteers in one neighborhood planted trees for homeowners who were not involved—however, they learned quickly if the homeowner does not plant the trees, there is no ownership of the trees and is less likely to care for them. Since then, the leader

now encourages recipients of trees to plant with them. Chris described a story of a family with three young boys who had recently moved into the neighborhood. Through the NeighborWoods program, the family planted about five trees on their lot. Chris expresses the boys will grow up knowing they helped plant those trees, "…and that's ownership. And I don't just mean ownership of that lot or the tree, but it's ownership of the community. It's being invested." He describes that when people participate, particularly kids, they feel more confident in their abilities to plant trees in the future and a stronger sense of longevity.

Additionally, Mike describes a neighbor who participates in guerilla planting in his neighborhood—the neighbor grows oaks in his yard across the street from the park and plants them without permission. However, this leader used this opportunity to partner with their neighbor and organized a tree planting using his trees. Mike expresses that hopefully, their neighbor will now feel more empowered and connected to the city to do things properly in the future so the trees will be properly cared for.

Many of the leaders have either organized or have seen various neighborhood activities that signify urban forest stewardship is occurring in their neighborhood. While Opal still led the Oak Village tree committee, they hosted many educational workshops and activities at local businesses in the neighborhood. They also hosted a community bike ride and tree tour with a SacTree Arborist. Part of the neighborhood's grant funding also paid for stump grinding, which opened up more spaces to plant trees. Fairmeadow also hosts tree tours and pruning clinics in the neighborhood. Annie is now also involved in other neighborhood groups—one group reads tree removal notices and attempts to save heritage trees in the city. She is also engaged in protecting trees at the State Capitol from impending developments. The county is now proactively taking out particularly hazardous Modesto Ashes in Floral Heights, which Chris remarks is a direct

result of their program, which approached the county and brought their attention to dead and dying trees in their right of way. Chris also mentions the neighborhood participates in pruning clinics and volunteer pruning days with SacTree. Volunteers who have participated in tree plantings in Rosemary Landing have conducted their own tree planting events in the neighborhood. Claire mentions another group is planning stump removals for a street in her neighborhood. She also believes her neighborhood is starting to work on advocacy—when the city wanted to turn a ditch behind their homes into a bike path, the community stood up and articulated their needs.

When asked about tree care maintenance regimes in the neighborhoods, most leaders wished they had a better answer. All of the leaders remark that tree care responsibility is dependent on who owns the tree—the homeowner, the parks, the city, the county, etc. However, although this may legally determine who cares for the trees, this does not mean they are. While SacTree and SMUD send reminders to care for their trees, many leaders feel a weakness in the program is the limited follow-through. A few of the leaders, like Chris and Claire, have done casual follow-ups with neighbors to check on tree care, but a lot of the leaders do not even know if anyone is coming back around to check on the trees (like SacTree, the city, or the county). A few of the leaders reach out to their connections in local government when they see an issue with trees in their neighborhood.

Farah would describe the management of trees in her neighborhood as "mismanagement." Both she and Claire also remark their neighborhood does not have a long-term strategy for tree care. Claire, Farah, and Chris similarly all request some sort of system or program to address care of the trees they plant, especially for the first three years. Farah believes SacTree should start a maintenance program or create internship opportunities for local kids in

the neighborhood. This opportunity would provide career and technical education opportunities for young people and create a pathway into the urban forestry industry. As mentioned previously, Farah also states people in her community need more incentives to address the urban forest's stewardship and continued support for the tree's entire life cycle.

All interviews took place in the early months of the COVID-19 pandemic, and it's safe to say it was at the forefront of everyone's mind. A common theme from interviews revealed all leaders (except Opal, who has since moved away from her neighborhood) expressed their concern about the pandemic's effect on their tree planting efforts. All SacTree activity was temporarily suspended, and gathering for community tree planting events was discouraged. Chris is concerned the neighborhood will lose momentum due to the gap in annual tree plantings. This is particularly concerning for him since the group leaders are now starting to look for replacements. He still plans to market the program for free trees and share other maintenance tips. Farah is concerned her neighborhood will lose out on the moments tree plantings offer to interact or network with their community with restrictions on face-to-face interactions. She also is worried about tree mortality if people are not able to go to work. Claire thinks COVID-19 will force them to be creative and figure out how to do things differently; she also has to figure out how to keep meeting with people to plan anything. Adriana believes COVID-19 is affecting her leadership and the way she approaches leadership. As a very relational person who loves to be around people, she expresses COVID-19 has been challenging. She also thinks that since people now have so much on their plate and so many other concerns, she has to push harder to keep tree planting efforts one of the critical issues. Annie remarks that 2020 will be the first year without a tree planting event since they started the tree planting program. She also states that COVID-19

has delayed other projects they wanted to initiate. Mike also mentions his neighborhood had to

cancel multiple events due to COVID-19.

Table 6: Survey Results for NeighborWoods tree planting volunteers

Question	5 (Strongly Agree)	4 (Agree)	3 (Neutral)	2 (Disagree)	1 (Strongly Disagree)
I felt confident in my ability to plant trees **before** the event.	32%	32%	5%	18%	13%
I felt confident in my ability to plant trees **after** the event.	68%	24%	5%	0%	3%
I plan to participate in future SacTree events	76%	18%	3%	3%	0%
I am more aware of urban greening needs in my community.	61%	16%	21%	0%	3%
I feel connected to the green spaces in my community (e.g., trees, parks, private yards, riverways, etc.)	84%	11%	5%	0%	0%
I know where to address urban forest needs for my community.	32%	16%	18%	18%	16%
I know where to address community needs beyond urban greening.	18%	18%	26%	18%	18%
I understood the benefits of the urban forest **before** the event.	50%	32%	11%	8%	0%
I understand the benefits of the urban forest **after** the event.	84%	11%	3%	0%	3%
I felt some sort of ownership in the long-term care of trees in my neighborhood **before** the event.	29%	21%	24%	16%	11%
I feel some sort of ownership in the long-term care of trees in my neighborhood **after** the event.	50%	21%	18%	5%	5%
I am inspired to take on more leadership in my neighborhood's urban forest.	32%	29%	21%	5%	5%

Participation in the survey was low (8.5% response rate), and responses do not

necessarily represent the neighborhoods described in this paper. However, responses offer a

preliminary glimpse of stewardship outcomes from the NeighborWoods program through the

lens of the participant.

The data collected from participants in NeighborWoods events paints an interesting story

about the urban forest's connectedness and stewardship (See *Table 6*). Although 84% of

respondents reported they feel connected to the green spaces in their community, only 29% felt

some ownership level in the long-term care of trees in their neighborhood before the

NeighborWoods event. Feelings of ownership increased to 50% following the event. This slight increase suggests the potential impact participating has on ownership and asks how leaders and other entities can further capitalize on that feeling of connectedness to encourage deep stewardship of their neighborhood trees. Additionally, how can leaders and organizations translate the feelings of pride in parks and other green spaces to the urban forest? Answering these questions is crucial because over two-thirds of respondents stated they plan to participate in future SacTree events.

DISCUSSION

It is clear from these community leaders' narratives that each neighborhood has unique strengths and issues that affect the current state of urban forest growth and initiatives. While there are some similar issues seen in multiple neighborhoods—like over-mature canopies reaching the end of their lifespan in Luna Park, Floral Heights, and Farimeadow—the socio-political realities in each neighborhood affect the outcomes of local natural resource provision. For example, Luna Park, Floral Heights, and Fairmeadow are all neighborhoods developed in the 1950s, and similarly, all three canopies were planted at the time of development. However, while Floral Heights and Fairmeadow reported developed canopies in the present day, Luna Park reported below-average urban forest cover and the presence of the dead, dying, and neglected trees in the neighborhood. As a historically marginalized community with a large population of people of color, Luna Park follows typical patterns of environmental justice literature which suggest less access to green spaces and resource distribution in low-income communities or communities of color (Anguelovski, 2013; Wolch et al., 2014; Ernstson, 2013). Similarly, when comparing the current state of urban tree cover in Diamond Park and inequities in quality public resources to more affluent neighborhoods in Sacramento, the differences exemplify how socio-

economic status typically privileges environmental health. As a disadvantaged community, Diamond Park residents have immediate needs and fewer resources, restricting the ability to provide long-term environmental or tree care.

The NeighborWoods community leadership model offers a solution for communities to have more control over how urban greening efforts are designed. While this is particularly important for low-income communities and communities of color, a community leadership approach is valuable in all neighborhoods to improve the urban forest's overall stewardship and subsequent sustainability. Each of the leaders brings unique skillsets and knowledge to the table. Their focus directs urban forestry activities' goals, such as a strong focus on parks or multi-modal transportation or biodiversity. These goals have also proven to be the needs of the community as well. As residents themselves, moving and using the spaces in their city and interacting with their community, they offer critical insight to guide urban planning initiatives. This is particularly true since all eight leaders were actively engaged in improving their neighborhoods before connecting to the NeighborWoods program and have a deep understanding of local issues and existing networks. Coupled with collaborative and situational leadership styles, particular needs of the community are more elaborately expressed. Leaders who acted through group settings or collaborative efforts included more diversity in voices which helped paint a more wholesome picture of neighborhood needs and potential. Group settings also helped identify additional community skills to contribute to the project and inspire future leaders.

Additionally, each leader felt their involvement in community tree plantings was meaningful. Many found their identities are now wrapped up in trees and feel more integrated with their communities as a result. This connection to trees and their deep understanding of the benefits trees provide makes them influential leaders and encourages neighbors to join their

efforts. Notably, most leaders give credit to their childhood experiences for their involvement in

community activism—this insight informs targeted efforts to train and find young community

leaders. Similarly, many leaders also describe the importance of involving children in their

efforts, providing hands-on nature experiences, and instilling a sense of ownership and

confidence in their abilities to carry forward these experiences into the future. This points to the

importance of involving younger generations in local urban forestry initiatives and inspire future

leaders.

Varying levels of capacity for community action around the urban forest currently exist

in each neighborhood. Differences are due to both existing potentials in the socio-political

system and through the organized efforts of the NeighborWoods program. Diversity in

leadership backgrounds and skills offered unique networks, contacts, and applied methods for

each neighborhood. However, there were many similarities in the types of public and

neighborhood resources utilized, like city and county staff, garden clubs, neighborhood

associations, and local businesses. Notably, both Farah and Adriana point to the importance of

having a local government champion to guide bureaucratic processes. The emphasis both leaders

place on the significance of this connection points to difficulties in the neighborhood's ability to

navigate these systems in the past, resulting in less access to public resources. However, through

Farah and Adriana's leadership, local government connections have now been forged to support

their efforts.

Community capacity seemed to depend on where the NeighborWoods program was

physically housed, the leader, and how long the program has been running in their neighborhood.

This also affected the level of involvement from SacTree, indicating the level of capacity and

independence for the neighborhood. The program in Floral Heights, for instance, has a long-

standing record of twenty years of engaged community plantings; during this time, they have taken over most of the event planning activities and mostly rely on SacTree for their expertise and partnership. In this case, the neighborhood has a very high capacity to control urban forestry success outcomes. Both Mike and Harvey operate their NeighborWoods activities under well-established neighborhood committees. Planning events is efficiently completed through their existing system, and these neighborhoods' capacity to independently complete tree plantings is high in this case. However, suppose the leaders move too efficiently and neglect to include community voices in the planning process. In that case, it may miss the point of supporting and increasing their neighbors' capacity and confidence to control efforts.

The formation of groups and committees around NeighborWoods activities suggests an increase in neighborhoods' capacity to come together to address local issues. Fairmeadow, Floral Heights, and Oak Village now have permanent groups with many members dedicated to these efforts. Luna Park's newly forged neighborhood association was partly due to their ability to come together to organize tree plantings. Members of the Oak Village group were able to take the organizational skills they learned from NeighborWoods efforts and effectively organized around another community issue. The formation of groups around tree planting efforts that move forward to organize around other civic activity positively supports SacTree's vision of building capacity to support community action even beyond trees. Similarly, building a community and network within the NeighborWoods program has proven invaluable to the leaders. The support and knowledge transfer within the NeighborWoods Leadership Summit interactions and other community leader workshops strengthen the program's success.

While the capacity to control urban greening efforts was built through community leadership, without the technical capacity, incentives, and resources needed for a tree's lifecycle,

communities like Diamond Park and Luna Park lack a significant component of urban forest sustainability. Adequate tree care and maintenance are tricky subjects in urban forest practice. 'Who is responsible' is generally believed to be the landowner where the tree stands. Still, this line of thought excludes others from understanding the importance of community stewardship for the urban forest. This also excludes and dissuades people who lack the means or knowledge to care for trees. In turn, this affects the ability of the neighborhood to self-organize to achieve a sustainable SES. A lack of supportive communities and adequate management regimes presents a difficult challenge.

While many leaders conduct stewardship and maintenance events in their neighborhoods, a lack of solid tree care efforts is a program weakness. When asked about tree care, most leaders feel less confident in their ability to effect change. Not only do they lack the bandwidth, but the leaders also feel this responsibility should be taken more seriously by all partners—the city, the county, SacTree, and their community. More resources should be allocated to communities in need to support effective change in the urban forest's long-term care in terms of equity. A right to quality tree care should not be exclusive to socio-economic status. Beyond financial support and incentives, opportunities exist to engage the youth in urban forestry practices to offer career and technical education and inspire leadership. As the NeighborWoods program grows and evolves, more efforts that focus on engaging the community in tree care and stewardship activities would be beneficial to the sustainability of the urban forest and the long-term success of the program. The participant survey provides a precursory glance of the exiting connections volunteers have to the green spaces in their communities and the untapped potential of translating this connectedness to deeper stewardship ties.

CONCLUSION

Communities are more likely to support urban greening projects that more closely align with the needs of the community; this is best realized through a community-driven planning process where community voices are considered. The NeighborWoods leadership model enacts this line of thought and relies on community leaders to not only be the voice of their neighborhood but engage other neighbors in the process as well. Interviews reveal that SacTree's goal of using community leaders to define community needs has been met and that the NeighborWoods program successfully conducts neighborhood-specific work as intended.

SacTree's ability to build community capacity around trees is demonstrated through the eight community leader interviews. Even within neighborhoods supporting higher capacity levels, SacTree provides much-needed technical support and further networking opportunities. NeighborWoods has uncovered potential capacity within neighborhoods by supporting community leaders in their efforts. SacTree's involvement with communities with lower technical and financial capacity has increased the neighborhood's opportunities to engage in activities, giving them a stronger sense of ownership and connectedness to their urban forest. This, in turn, increases the likelihood of stewardship activities and sustainability. However, it is unclear how this increase in capacity is translating to the care and long-term maintenance of trees.

Research demonstrates the need for stewardship programs and the tree care involved. Most of the stories told by community leaders seemed to end at the tree plantings. Although many leaders are engaged in stewardship activities like pruning clinics and education dissemination, not one leader has enacted a long-term strategy or plan to maintain and sustain their local urban forest. Conflicting ideas of who is responsible for tree care calls for potential

solutions between involved parties for more confidence in long-term care. For leaders to feel confident that the trees in their neighborhood will be well-cared for, future planning efforts should prioritize creating a stewardship plan for the neighborhood. A few of the leaders have called out this need for a stewardship program within the NeighborWoods program. Based on the importance of early childhood references to engaged civic action, a youth program combined with stewardship efforts could be a critical opportunity to inspire future urban forestry leaders, instill stewardship, and advance career and technical education opportunities. This opportunity should also be a joint effort among partners and not left for the primary responsibility of SacTree; leaders reveal the importance of involving the city and county in efforts that should apply to the long-term survivability of the urban forest.

Research also demonstrates the need for more incentives for communities to plant trees and participate in stewardship activities. Potential incentives can be constructed by developing grant opportunities or programs that target a long-term commitment to tree care. Similarly, stipends for internship programs can encourage participation. To help foster ownership, events can include activities that appeal to a stronger sense of connection and care for trees. Organizations and communities involved should identify other types of incentives that are needed or practical for their neighborhoods.

Future Directions

This study is intended to highlight the NeighborWoods model as an effective method in building community capacity around the urban forest. Other organizations interested in implementing a similar community-driven methodology may find similar results as the SacTree NeighborWoods program. Identifying local leaders interested or engaged in neighborhood issues is a critical component to begin conversations around community needs and goals.

The viewpoint of the community leaders limited this study. As leaders in urban forestry initiatives, it is no surprise they are all enthusiastic participants in the process. This provides a potentially biased view of the urban forest related through this paper. Future research should take a deeper dive into the complexities of the neighborhoods' relationship with the urban forest for a more holistic and unbiased view. Such a report would also provide critical insight to guide the production of long-term plans for the neighborhoods and strengthen the community leader's potential. Future research should also take a deeper dive into the effect community leaders have on volunteer attitudes and behaviors to provide a more in-depth look into how stewardship is changing through the NeighborWoods program. This would also inform stewardship needs within communities.

Additionally, future work from all partners should focus on more immediate heat relief options for communities suffering from a lack of tree canopy or a young canopy. Community benefits are primarily obtained from mature trees, which may take many decades, depending on the species. Other programmatic initiatives that aid in climate change adaptation, such as cooling centers and reflective surfaces located within the area, should be implemented and maintained as immediate relief options, particularly for disadvantaged communities. Partnering with organizations engaged in these programs would fill an obvious hole in public health and safety that urban forest initiatives attempt to alleviate.

In addition to the concept of climate adaptation, future work should attempt to scale-up the NeighborWoods methodology to apply to significant environmental issues such as climate change. Findings in this report support a long-term solution to engage communities in sustaining SESs that improve public health and resiliency in the face of environmental threats. Scaling-up the NeighborWoods model can help cities plan for climate adaptation.

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Finally, a social network analysis would benefit the NeighborWoods program goals. A social network analysis would assess the social complexity involved in civic stewardship systems by examining stakeholder relationships in resource management, social capital in collaborative planning, structure and effectiveness of networks facilitated by government programs, and network governance of ecosystem services. Interviews revealed potential networks and connections exist within the neighborhoods. Leaders found many groups, organizations, and individuals who supported their tree planting efforts. But where does this enthusiasm go after the tree is planted? Are these resources and connections not engaged in the long-term survivability of the tree? Have they been offered the opportunity? There needs to be a shift in thought from the "burden" of tree stewardship to an honoring of sorts. Reframing the idea that we are celebrating and caring for something that will eventually provide us so much could tap into the enthusiasm of supportive community networks, further deepening neighborhoods' capacity to address urban forest stewardship.

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Appendix A: Community Leader Interview Questionnaire

University of California, Davis

Interview Questionnaire: Community Leaders

Building stewardship for urban forest systems: an evaluation of the leadership model in a local neighborhood tree planting program in Sacramento

Lead Researcher

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Thank you so much for volunteering your time to participate in this interview! Your answers will be kept confidential.

The purpose of this research is to determine how the outcomes of the NeighborWoods program practices align with the program's goal of building communities' capacity to address urban forest stewardship. The interview has been designed to collect information on the process you used to organize and conduct your NeighborWoods event and how you feel this program addresses your community's needs.

1. How would you characterize your neighborhood's current urban forest?
    a. Is the tree canopy coverage fully developed or sparse?
    b. Is it in need of care?
    c. Is it growing?
    d. Is there interest in your community to protect/grow the urban forest?
    e. Other characteristics you would like to describe
2. What would an ideal urban forest look like for your neighborhood?
3. Describe the project in which you participated.
4. What inspired you to become active in your community?
5. What does the urban forest mean to you?
6. How do you communicate the value of your NeighborWoods project and the urban forest to the volunteers?
7. How has this project led to further action in your community?

8. How do you feel your role as a leader affected the capacity of your neighborhood to address urban forest needs? (For example, network building, relationship building, communication resources, community assets, funding opportunities, community resources, problem-solving skills, community advocacy, etc.)
9. How has your leadership style evolved from the beginning of the project to now?
10. What has this experience of being a community leader meant to you?
11. What resources did you utilize during your project implementation?
12. How is your neighborhood supporting the NeighborWoods project and other urban forest efforts?
13. What are the management strategies your neighborhood has enacted for long-term tree care?
14. What are the further needs from the NeighborWoods program and SacTree?

Thank you for your time!

Appendix B: Sacramento Urban Area Tree Cover and Disadvantages Communities by Census Tract

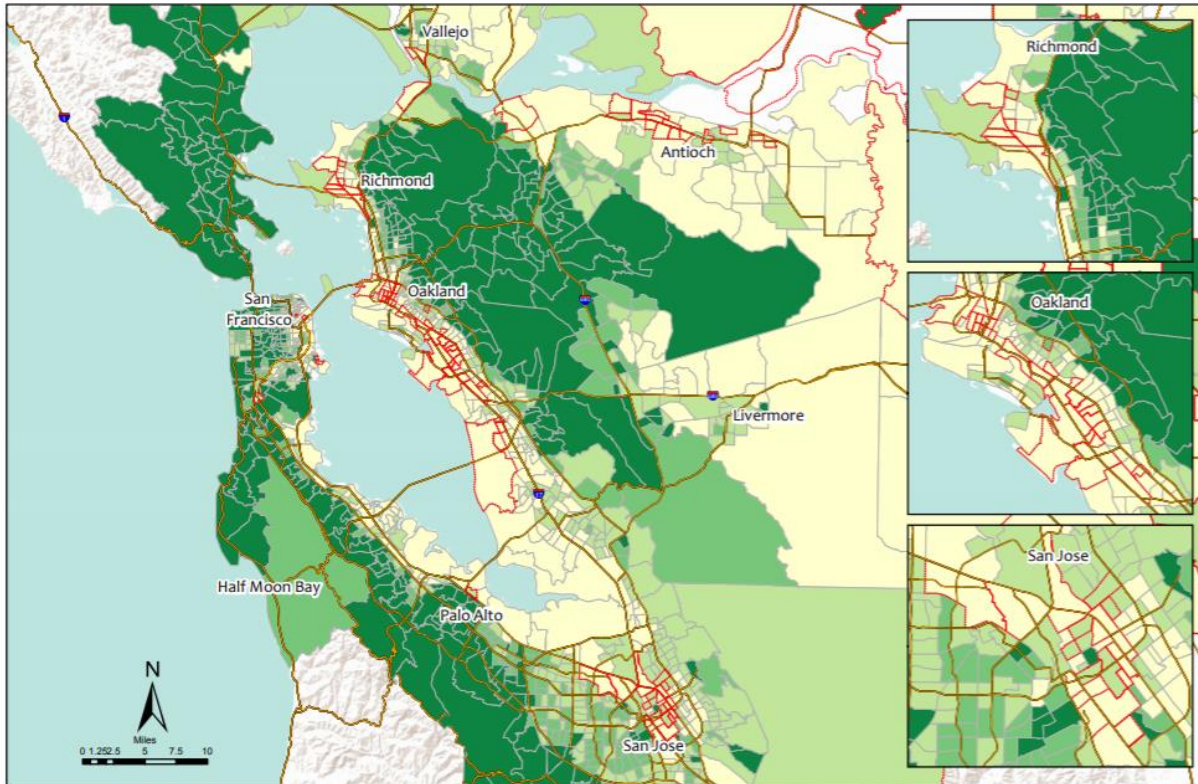Sacramento Urban Area Tree Cover and Disadvantaged Communities by Census Tract

Appendix C: San Francisco Bay Area Urban Tree Cover and Disadvantages Communities by Census Tract

Bay Area Urban Tree Cover and Disadvantaged Communities by Census Tract
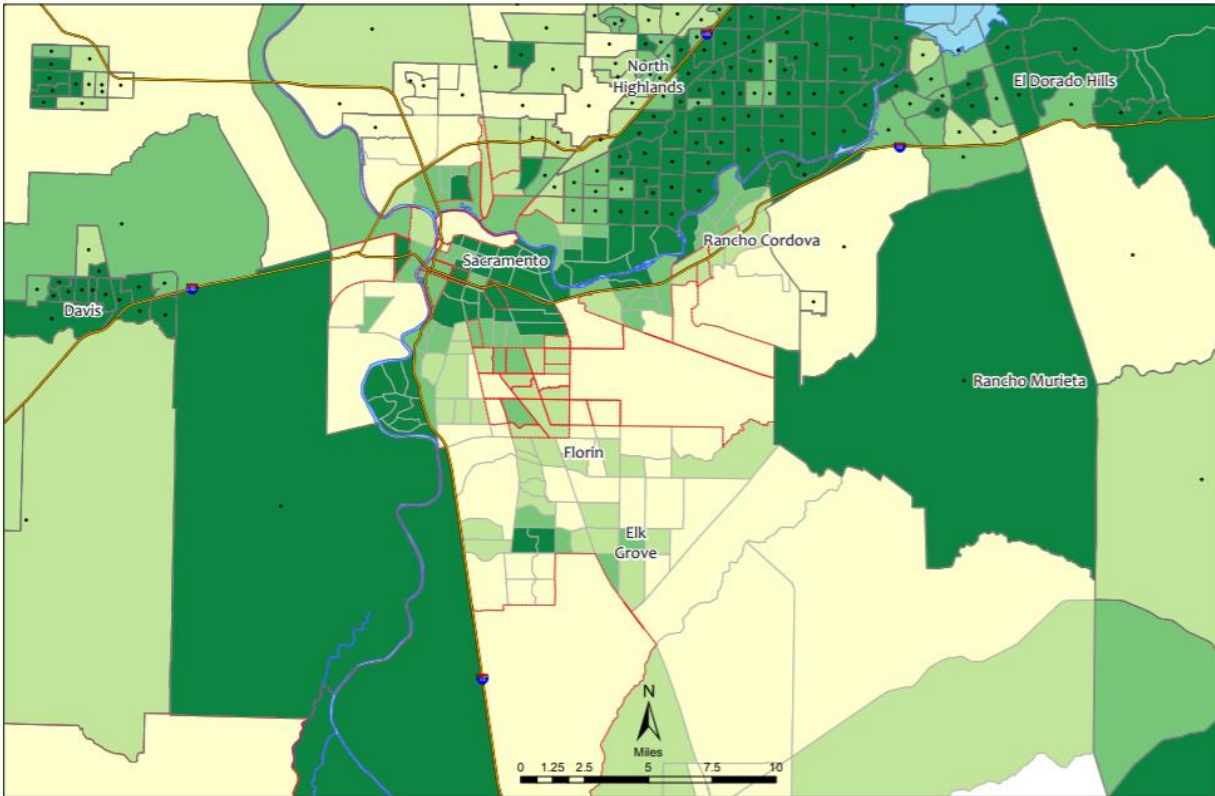
| Urban Tree Cover | 0 - 9 % | 10 - 15 % | 16 - 20 % | Over 20 % |
| Disadvantaged Community | Temperature > 90° for at least 75 days of the year | | Highway | |

Data Sources: Disadvantaged Community data derived from CalEnviroScreen v 2.0; Tree Canopy Cover derived from EarthDefine, 2012; Days over 90 data derived from PRISM 2004 - 13 average.

Appendix D: Los Angeles Urban Area Tree Canopy and Disadvantaged Communities by Census Tract

LA Urban Area Tree Canopy and Disadvantaged Communities by Census Tract

Data Sources: Disadvantaged Community data derived from CalEnviroScreen v 2.0; Tree Canopy Cover derived from EarthDefine, 2012; Days over 90 data derived from PRISM 2004 - 13 average.