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Scaling up urban agriculture in Tempe, Arizona: A participatory planning case for early urban food policy

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Abstract

This paper documents an early-stage participatory planning process to scale up urban agriculture in Tempe, Arizona, an arid, land-constrained city that in four contiguous neighborhoods faces high rates of food insecurity and vulnerability. Using a Participatory Action Research (PAR) approach, a transdisciplinary team of researchers, city staff, and community-based organizations collaborated with neighborhood residents to assess the state of urban agriculture, identify local priorities, and co-develop ten policy recommendations. The process included 86 food access surveys, mapping, practitioner interviews in Tempe and with representatives from six

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other cities, and community workshops. Residents emphasized the need for urban agriculture spaces that support food production, education, workforce development, and community building. Key barriers included limited funding, volunteer instability, and poor communication of existing resources. Despite water scarcity and land pressures, the study highlights how urban agriculture when water-smart and strategically located can serve as resilience infrastructure and address intersecting civic, environmental, and social goals. The case contributes to growing evidence that participatory planning supported by trusted intermediaries can shape agendas before formal food policy structures exist, and foster civic engagement, social connections, and institutional learning essential for food systems transformation. It serves as an example of pro-connection public engagement that addresses the loneliness epidemic, and proposes recommendations for transitioning from fragmented grassroots efforts to a coordinated, equity-centered urban agriculture system in Tempe. The findings offer insights for other cities exploring participatory food planning in the absence of formal food policy structures.

Keywords
participatory planning, urban agriculture, urban food policy, food governance, equity, civic health

Introduction and Literature Review

Cities play an increasingly important role in food systems governance, and their role in creating sustainable and resilient food systems is recognized by the United Nations Sustainable Development Goals (United Nations Department of Economic and Social Affairs, 2015). Although food and agriculture have been traditionally excluded from urban planning for the best part of the 20th century, especially in the Global North (Pothukuchi & Kaufman, 2000), the turn of the 2000s saw an increase in urban agriculture policy instruments in the U.S. (Halvey et al., 2021). Urban agriculture (UA), described by the U.S. Department of Agriculture as including "backyard, roof-top and balcony gardening, community gardening in vacant lots and parks, roadside urban fringe agriculture and livestock grazing in open space" (USDA Climate Hubs, 2020), is often advanced as a solution to increase local resilience and sustainability because of its potential to reduce food transportation emissions, strengthen the local economy, and provide an array of environmental and social benefits for urban communities (Hebinck et al., 2021; Lal, 2020; Mok et al., 2014; Nogeire-McRae et al., 2018; Siegner et al., 2018; Vermeulen et al., 2018). In fact, 15% of U.S. farms are now located in the 50 most populated cities (Hinds, 2023) and many municipalities have expressed intentions to scale up urban agriculture by "increasing the number and diversity and boosting size, productivity and capacities of urban agriculture operations" (Qiu et al., 2024, p. 84). More than 300 local governments around the U.S have been engaging recently in food systems planning and policy to various degrees (Halvey et al., 2021; Raja, 2024), most of which include participation planning (Beckie et al., 2013, Berke et al., 2006, p. 293; Freedgood & Fydenkevez, 2017; Karetny et al, 2021; Raja et al., 2018; Sloane et al., 2019). Indeed, participatory planning, which necessitates citizen participation and community engagement to produce policy in collaboration with government (Caldeira & Holston, 2015; Smith, 1973), is crucial to successful, viable, and equitable UA public policy planning (American Planning Association, 2025; Cassatella et al., 2022; Diekmann & Ostrom, 2020; Poulsen et al., 2014). While equity is often stated to be a core goal of food planning, detailed documentation of the specific steps taken to involve residents from traditionally underserved groups in early municipal food and UA planning remains limited—especially before initiating formal food policy councils or food action plans.

Disclosure
This study was conducted according to the guidelines of the Declaration of Helsinki and considered exempt by the Institutional Review Board of Arizona State University pursuant to Federal Regulations 45CFR46 (STUDY00016641).

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In Arizona, although 36% of the land area is used for agricultural purposes and 14.1% of the population is food insecure (including 20% of the Latino population), only a few local governments are engaged in food and urban agriculture planning (Feeding America, 2023; University of Arizona Cooperative Extension, 2022). The City of Phoenix is the only local government to have formally adopted an urban food action plan at the time of this research (City of Phoenix, 2020), in spite of multiple participatory efforts led by community groups such as the Pima County Food Alliance and the Arizona Food Systems Network (Arizona Food Systems Network, 2022; Bhakta et al., 2024) and ongoing work initiated by the City of Flagstaff (City of Flagstaff, 2025). Although these efforts all seek equitable community engagement to inform food planning efforts, the extent to which food insecure residents are able to actively propose, design, engage with and comment on the cities' initiatives to develop food and UA policies often remains unclear, making it difficult to assess the scope and depth of participatory efforts. This article contributes to that gap by detailing the formative phase of participatory UA planning in Tempe, a mid-sized and resource-constrained Arizonan city seeking to build equitable food governance from the ground up.

Urban agriculture planning and governance processes have been criticized for reproducing the overall food system's prevailing socio-economic inequalities (Alkon & Agyeman, 2011; McClintock, 2014; Raja 2024). Collaboration in urban food systems policy-making is often limited to the actors who can more easily understand and access the cogs of governance and power networks, with leadership roles often occupied by white middle-class residents (Hoover, 2013; Maurer, 2021). Even when diverse actors engage in UA planning and governance, such as farmers, food businesses, and food policy councils, it is not always clear who does and does not benefit from the process (Carrad et al., 2022; Moragues-Faus & Battersby, 2021). People who experience food insecurity are rarely actively engaged in food policy making and governance although they are often the direct target (Anderson, 1990; Raja, 2024). This merits attention because inequitable UA leadership produces unequal distribution of impacts, which can undercut its potential benefits (Sbicca, 2019). Early stages of UA planning present the opportunity to lay down structures and processes that will support long-term collaboration of policymakers with diverse groups, especially those who are traditionally less represented, less familiar with local policymaking processes, and/or experience food insecurity. For meaningful transformation of policy making and governance, local governments should explicitly plan for inclusive processes (Clark et al, 2017). By presenting the participatory efforts of the City of Tempe, this work aims to serve as a blueprint for practitioners and researchers seeking to initiate urban agriculture planning efforts that aim to engage residents from traditionally underserved neighborhoods.

Until the mid-20th century, Tempe was basically a small farm community, 13 miles from Phoenix, the state capital. Today home to over 189,000 inhabitants, Tempe has been engulfed by the urban sprawl of the Phoenix metropolitan area. Housing and commercial development overtook most of its arable land (Shrestha et al., 2012), and urban agriculture initiatives today are scarce and fragmented. Over the last decade, the City of Tempe government has gradually shown interest in UA, as it aligns with the government's sustainability and resilience strategy (Kay et al., 2022; Withycombe Keeler et al., 2019). Both the Tempe 2040 and 2050 General Plans also explicitly set objectives to support and develop UA initiatives (City of Tempe, 2013, Land Use and Development Chapter, p. 13; 2023a, pp. 247–248). However, Tempe urban agriculture aspirations are constrained by its relatively high population density, limited space, development pressures for housing and businesses, socio-economic disparities, and the U.S. Southwest Megadrought (Williams et al., 2022). The combination of these factors is pushing many local actors to encourage housing development over agriculture, and the new "Ag to Urban" bipartisan program aims to save nearly 10 million acre-feet of water through the sale of Arizona farmlands to housing developers (Office of the Governor Katie Hobbs, 2025; Porter & Sorensen, 2023).

Conscious of these challenges, our project team partnered to develop a two-year planning

grant proposal to scale up UA and leverage its benefits for economically vulnerable populations. Initiated by the USDA Office of Urban Agriculture and Innovative Production (OUAIP) in 2022, the project specifically focused on engaging low-income populations with low access to food (LI/LA) in participatory planning to initiate UA efforts, especially with the University Heights, Escalante, Victory Acres, and Alegre Community neighborhoods, which constitute Tempe's very high-equity priority zones (Appendix A). Our participatory action research focuses on the early stages of food and urban agriculture planning and seeks to better understand how to effectively engage LI/LA neighborhoods to transition from fragmented grassroots UA initiatives into a "scaled-up" and integrated system with institutional support and community value. To guide this work, we asked: Which programs and policies can help scale up urban agriculture in Tempe to respond to the needs of residents experiencing food insecurity while aligning with the city's agenda for sustainability and resilience? Recent research by Qiu et al. (2024) proposes a conceptual framework that identifies pathways through which scaling up UA can occur, distinguishing three phases in a "triple S" growth curve that describes the pathways for scaling up UA. Each phase is characterized by its respective accelerator: individual accelerator (Phase I), institutional accelerator (Phase II), and economic accelerator (Phase III). A series of transformative changes are needed in each phase for UA to continue growing, scaling up, and progressing towards desirable pathways (Figure 1). Without such changes, the efforts risk declining and leading to undesirable outcomes. The purpose of this participatory and transdisciplinary research is to (1) pinpoint which phase currently characterizes the state of Tempe urban agriculture, and identify policies and programs to support current actors and propel the city into further phases, (2) provide a documented case of early urban food planning, and (3) offer insights for other cities exploring participatory planning to create or develop urban food policy.

Methods

We used Participatory Action Research methods (Bradbury, 2015; Cohen & Reynolds, 2014) to identify the core issue (i.e., how to scale up urban agriculture in Tempe to align with the City's goals for sustainability and resilience, and respond to the needs of residents experiencing food insecurity) and design the research (i.e., conduct a baseline assessment, review existing UA initiatives in other U.S. cities, and develop policy recommendations for Tempe) (Figure 2).

The project team (PT) included city staff from Tempe's Office of Sustainability, local community organizations (one focused on building community leadership, education and health in the Phoenix metropolitan area, one promoting the development of food forests in Arizona, and one promoting school gardens) and the research team (RT) was composed of researchers from different disciplines working to support Arizona food systems. Together, they co-defined, co-designed, and co-implemented the research project, and most project team members are co-authors of this paper. Additional participants—primarily Tempe residents—engaged throughout the project through consultation, cooperation, decision-making, and providing information, as defined by Karl (2002).

To address the core issue, the project team developed two sub-research questions: RQ1 – What is the state of urban agriculture in Tempe? and RQ2 – Which practices from other cities can best inform scaling up urban agriculture in Tempe? The research questions and design initially stemmed from the UA planning grant proposal, co-developed by the project team partners through a series of meetings in 2021. They were further refined throughout the two years of the project across team meetings and participants' engagement, which was anchored in the project design. The project team also identified four core priorities for the project: food security, education, workforce development, and water security (definitions in Appendix B), which reflected priorities from the participating community organizations and Tempe's Climate Action Plan.

Baseline Assessment

To answer RQ1, the project team conducted a baseline assessment between fall 2022 and spring 2023 of existing urban agriculture initiatives in Tempe, that included four elements:

(1) The research team reviewed the City Council Strategic Priorities, the Tempe Climate Action Plan, the Urban Forestry Master Plan, and the AZ Indigenous Foodways Yearbook (City of Tempe, 2017; City of Tempe Strategic Management and Innovation Office, 2022; Kay et al., 2022; Zah, 2020) to identify Tempe's existing goals and plans relevant to urban agriculture.

(2) The research team conducted ten semi-directed interviews of UA practitioners in different Tempe sites. While this number may appear limited, it reflects the relatively small number of active UA sites in the city. The sample included four community gardens (the only ones known by the City of Tempe at the onset of the project), one urban farm (the only registered farm in the city during the project), four school gardens (among the six most active known to the project team at the time), and a student-run homestead garden. These sites were selected from the sites listed on public records or known to the project team, and selection was based on the availability of the growers in charge of each site, their work with LI/LA populations, and their work towards the project team's priorities (food security, workforce development, education and

Figure 1. Developmental Pathways for Scaling Up Urban Agriculture Over Time

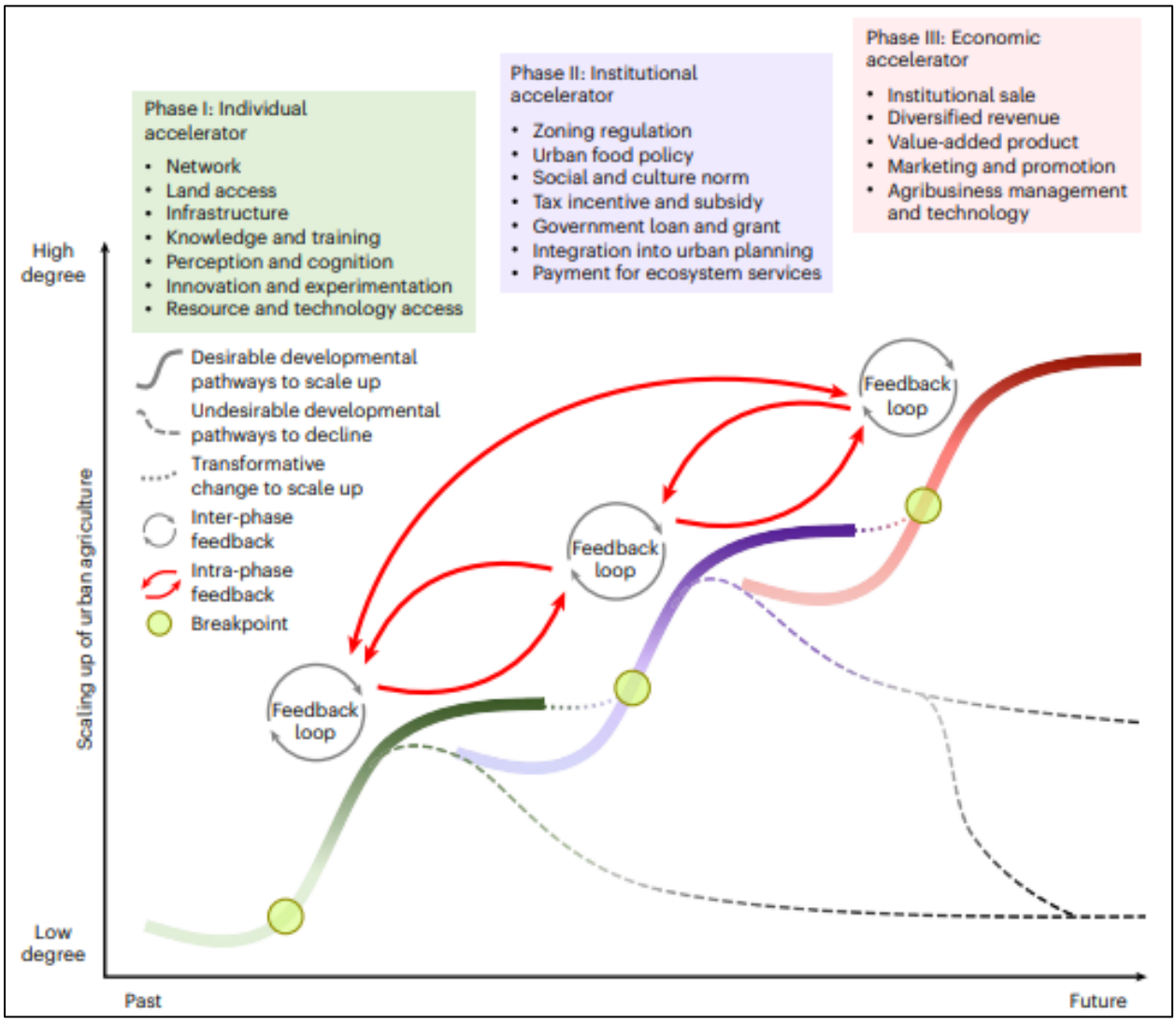
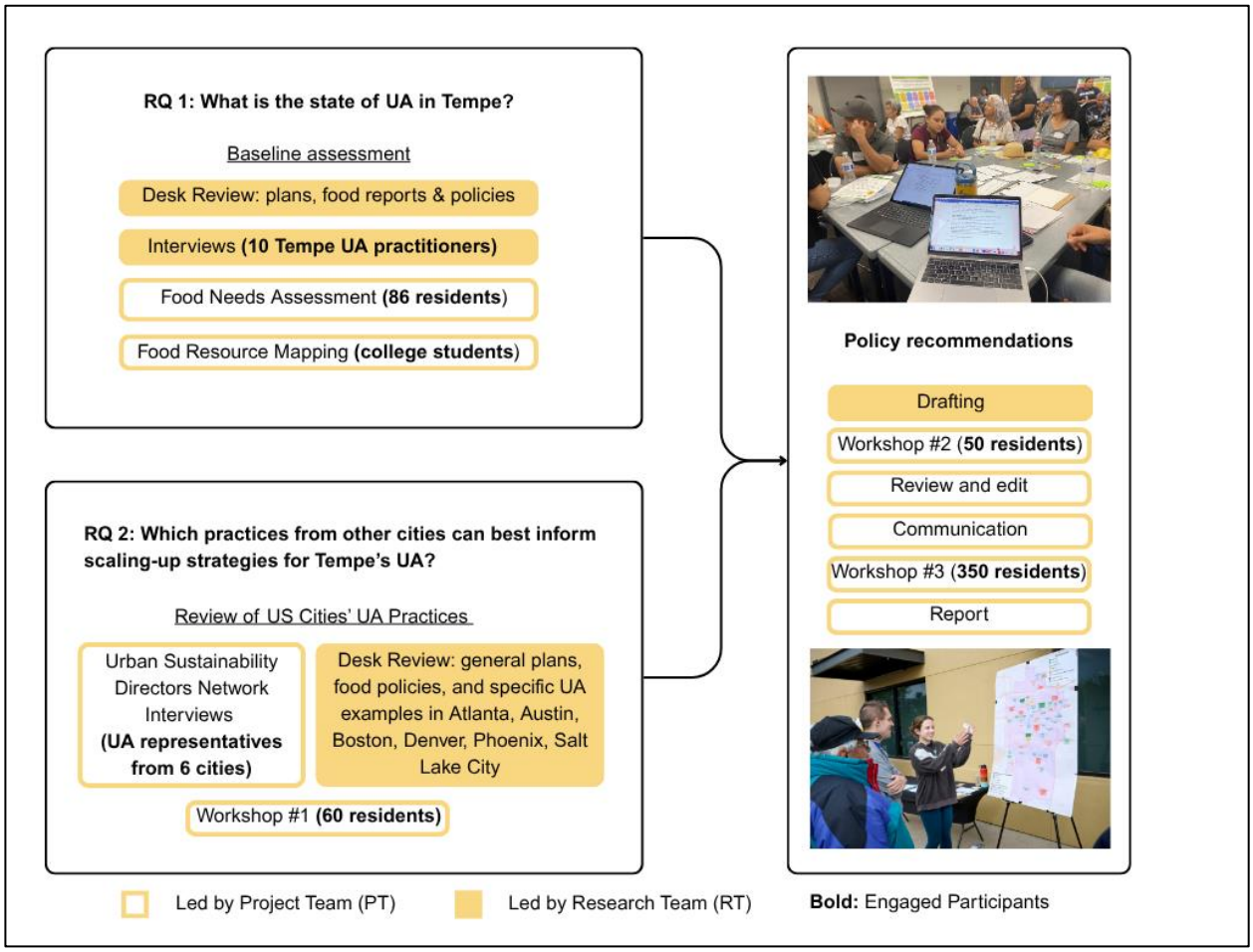


Figure reproduced with permission from Qiu et al. (2024, p. 87).

water security). Although they constitute the largest number of UA sites in Tempe, individual home gardens constitute the least represented category in the sample because there is no record of these sites and building a representative sample would have gone beyond the project's capacity, and because these sites are not as accessible to the public as the other sites. The only home garden included in the sample was student-run, located in a low-income apartment community, and visible and accessible from the street, which best aligns with the project priorities of supporting food security, workforce development, and education. We used Applied Thematic Analysis (ATA) to define and analyze themes emerging from the interview transcripts (Guest et al., 2012). The analysis served to identify current successes and barriers experienced by UA practitioners, the perceived role of UA for the project's four priorities, and to highlight potential solutions to scale up UA in the city (Appendix C).

(3) Community health workers from the project team surveyed 86 community members (60% Hispanic: Appendix D) in the Escalante, Victory Acres, and Alegre Community neighborhoods, which have a high concentration of Hispanic residents (more than ten points above the city average of 22%). One-on-one surveys were conducted at a variety of locations, including the Escalante community garden, the local food bank, Iglesia de Dios Pentecostal church, the Escalante community center, and through door-to-door canvassing efforts in Alegre, Escalante, and La Victoria/Victory Acres. Although the sample is not statistically representative of the neighborhood population, as it includes a higher proportion of Hispanic and female

Figure 2. Participatory Action Research: Project Design



respondents, the recruitment strategy—centered on community hubs such as gardens, food banks, and churches—captured perspectives from residents most connected to local food access efforts, which are central to the study's aims. The questionnaire (Appendix E) pertained to food access, food security, nutrition and education, and asked which UA initiatives they would like to see in their neighborhoods. The purpose of this needs assessment was to understand the food environment of these residents, to provide opportunity for residents to suggest paths to improve UA in their neighborhoods, and to determine their priorities in scaling up UA in the city. Residents were able to give feedback on the results of the need assessment during workshop #2.

(4) The mapping exercise allowed the project team to review and categorize the existing sites that form the fabric of UA in Tempe, identify the spatial trends, and create a visual baseline of sites to share with the public. The project team used the results of the interviews (2) and surveys (3) and worked with a group of college students to identify the sites that support UA and provide support to people experiencing food insecurity, review their activity, and generate a publicly accessible map using ArcGIS.

Review of Urban Agriculture Practices in Selected U.S. Cities

To answer RQ2, the review was conducted in three steps:

(5) The project team reached out to the Urban Sustainability Directors Network (2025) with a request to interview urban agriculture representatives. USDN partners from Atlanta, Austin, Boston, Denver, Phoenix, and Salt Lake City offered to share their insights. After a preliminary desk review of the cities' activities, we conducted semi-structured interviews in December 2022 and January 2023 led by the City of Tempe staff (questionnaire example in Appendix F). These were not recorded or transcribed but were the subject of extensive notetaking by two to four members of the project team. The purpose was to discuss the funding and governance structure of their UA initiatives, and their unique successes and challenges. To analyze the content of the interviews, the project team members compared notes, held meetings with the partnering organizations on the project, and identified some activities and strategies that could be applicable to Tempe.

(6) After the interviews, the research team compiled a list of initiatives in the cities through in-depth desk reviews of their food plans, policies, and programs, and created six city profiles of UA best practices that were returned to each interviewee for validation.

(7) The project team selected eight initiatives that best aligned with the project team's priorities and results from the baseline assessment, and submitted them for residents' feedback. The initiatives were presented on thematic posters during community workshop #1 and used to collect residents' thoughts and priorities (Appendix G). This workshop took place during an Escalante outdoor festival organized by Parks and Recreation that attracted 150 participants thanks to multiple communication channels (e.g., email, community centers, posters, and social media). During the festival, participants walked around and interacted with different community booths. Sixty Tempe residents directly engaged with the posters presented by our research team, placing stickers to vote for the initiatives they liked, and sharing comments on how they saw these initiatives contributing to their vision for UA in their city (Appendix H).

Policy Recommendations

Following workshop #1, the research team used participant feedback and preferred initiatives to draft ten policy recommendations that aligned with the project team's priorities and the results from the baseline assessment. These recommendations were initially reviewed by other members of the project team, who provided details on how to weave them into existing local programs, then shared the recommendations with 50 adult community members (75% Spanish speakers) during an evening workshop (workshop #2) held in the Escalante neighborhood (see Appendix I for agenda and facilitation guide). Participants were

recruited by partner community organizations using existing contacts and mailing lists and by placing posters at the community center. Many residents attended with their children, and food, childcare, and a free bag of local produce were provided on site. Residents formed into groups, with members of the project team—a facilitator, a notetaker, and a Spanish-English translator—presenting drafts of the recommendations using images (Appendix J). Participants could express their thoughts verbally, through drawings, sticky notes, and confidentially, using an envelope system (Appendix K). Throughout the conversations, the participants decided on their preferred recommendations to guide the city's future AU work. After the discussions, the workshop also included a cooking demonstration with tasting, which further elicited comments and thoughts from the participants (Appendix L). Following the workshop, the project team integrated the feedback to finalize the policy recommendations shared with the residents and the City of Tempe via a digital report, and during a public workshop held in the Alegre Community (workshop #3) with over 350 Tempe residents. During this workshop, interested participants engaged with the map and the recommendations, and received complimentary seedlings, soil, and local produce on a first-come, first-served basis thanks to a partnership with local farmers (see Appendix M for more details).

Reflexivity and Evaluation

After each workshop, the project team members gathered to discuss the event and reflect on their own engagement with community members. They asked themselves: What went well? What did not? Did we miss opportunities to better listen? Were we able to effectively engage all participants? These one-to-two-hour debriefing sessions encouraged us to continuously improve our community engagement and trust-building efforts (Clark et al., 2017). Consistent with Participatory Action Research principles, the project team informally evaluated engagement effectiveness through workshop attendance tracking, demographic diversity, and participant feedback forms (whenever possible), and post-event debriefs with facilitators. Indicators of success included recurring and multilingual participation, and visible integration of residents' priorities into the policy recommendations.

Results

The baseline assessment, review of best practices from other cities, and regular resident engagement informed the development of policy and program recommendations.

RQ1: State of Urban Agriculture in Tempe

Weaving perspectives from Tempe UA practitioners with those from the project's neighborhoods, the project team identified existing challenges and opportunities for Tempe UA.

Food Insecurity and Need for More Healthy Food Options

The residents confirmed their interest in UA initiatives, in part motivated by their experience with food insecurity. The overwhelming majority (94%) purchased their food at the grocery store, but 53% of them worried about running out of money, and 48% expressed not having enough money to buy the food they need, which confirmed the high proportion of individuals experiencing food insecurity in our sample. Less than half were satisfied with their options to purchase healthy food. They viewed UA as a means to increase food access and to learn to grow their own food. All UA practitioners reported that their gardens/farms increased personal and community food access. Many residents also noted time constraints and indicated preference for community orchards and gardens with shared plots so that they could collaborate on production efforts and build a sense of community.

Need for Resources and Coordination

All Tempe UA practitioners expressed needing more resources, especially funds and manpower, which are vulnerable to fluctuations over time. They asked for funds in the form of grants and rebates on supplies, and for existing grants to be more accessible as the application process can be daunting. One gardener interviewee said, "Trying to find funding for the garden specifically is really difficult because we don't generate any kind of income. It's hard to create any kind of pool for funding for things. It's part of trying to look for

grants, and it all takes a lot of time to try to get donations or grants or things like that." Labor was also a leading concern, as most sites to run their activities heavily rely on volunteers, who take time to train and can be unpredictable. Volunteering can provide a path to workforce development, but it also requires capacity and adaptability from the hosting organization. A community garden leader mentioned the lasting effect of COVID: "a lot of volunteers have spread away, it's kind of like we are starting over again." As a result, more than half the practitioners would like to receive support from the city in attracting a flow of volunteers. A school garden coordinator asked for a "team of volunteers that would come out and help the school build it" because "teachers are really overworked." The flow of volunteers appeared to be even harder to manage in low-income neighborhoods: "In this neighborhood, you're not going to get parents that come on weekends and volunteer for gardens. They're working. They're hard-working families, and they just don't have the time to come and just play in the garden. And we had, we'd have a parent-garden day, and I have maybe five parents show up." Even when there are enough volunteers, training them takes significant resources from the site coordinators, who need to plan garden activities around their involvement, availability, and preferences. While three practitioners have many years of experience in managing volunteers, others could benefit from their expertise. One of them said: "I would love to be learning from someone who knows more than me. A lot of times I'm kind of like the end-all person in the garden, and I feel like I know so little."

Residents and practitioners alike asked for better communication on the existing resources and initiatives to support urban food production. For example, a school garden coordinator pointed out that it was not widely known that the city offers small grants for school gardens, so many schools do not apply for them. Residents reported not knowing where to find healthy food options. A majority of them (52.3%) did not know about the Escalante community garden and its CSA box options, although most of them live less than a mile away from the garden. Out of 10 interviewees, four UA practitioners asked for a point person at the City of Tempe government to coordinate UA initiatives, serve as a knowledge source for the community, communicate existing resources, and support networking among growers.

Despite the southwest Megadrought, water security did not appear to be an immediate concern for any of the practitioners, possibly because none were in charge of the water budget for their garden, which was handled by either the city, a school district, an administrative department, or a Homeowner Association. However, all practitioners noted that they use drip irrigation and desert-adapted plants as much as possible.

Integrating Agriculture in Public Spaces

The interviews and surveys revealed a strong interest in weaving food growing spaces into public and community spaces, mostly parks and schools but also parking lots and apartment buildings. These spaces would increase food security through improved food access, and offer education and workforce development opportunities. Residents and practitioners believed that gardens should be included in regular planning for city development and maintenance of public areas: "When the City is redoing a park, it could include a garden in their plans, you know, just like they include a basketball court, a playground, a dog run, whatever it is." One practitioner expressed that existing community gardens located on community center grounds could become food hubs and serve as a model for other Tempe parks in: "I would have loved to see this kind of CSA distribution at parks throughout Tempe so that people could just walk one day a week and pick up fresh local produce from farms and also be invited to get involved in other garden activities if it interests them." In fact, about 83% of surveyed residents believed that only building recreation sites should be second to building food production sites. According to practitioners and residents, these hubs should include community gardens, subscription CSA boxes with food from the gardens and from local farmers, nutrition education, cooking and gardening classes, and even food entrepreneurship incubators. Practitioners stressed that local farmers should play a key role in those hubs. They should be paid to educate the community on local food systems, and could also

support training the city landscapers so that food growing spaces coexist with traditional landscapes in city parks.

Parking lots offer an unusual but promising growing site for Tempe. Parking spaces constitute 10% of the Phoenix region (Hoehne et al., 2019); according to city code, a minimum of 12% of the surface area of all parking lots should be landscaped with shade trees, shrubs, and ground cover plants (City of Tempe, 2025a). One practitioner led a local non-profit with a unique garden initiative on a Tempe parking lot, growing watermelon, eggplant, okra, basil, and more, all freely accessible for people to take: "We are flourishing over here. If you need it, take it." The organization also uses the garden space to offer classes on nutrition and well-being and provides employment and training opportunities to residents in transitional housing. They are ready to collaborate with the City to reproduce their model, and believe there could be an opportunity to integrate food gardens as landscaping for new housing developments: "Okay, build apartments, but the people that live in those apartments should have no landscaping but gardens."

Schools also offered an important opportunity to grow food in Tempe. The map revealed 23 sites in Tempe with some form of school garden (City of Tempe, 2024b). Some of these were no longer operating and/or were very limited in scope (e.g., consisting of one raised bed) but all revealed interest from some school members at some point, which could be leveraged with proper support. Considering that the Tempe school districts are some of the largest landowners in Tempe, and that the schools are spread out across town, they could provide food and educational opportunities for most city neighborhoods. The interviewed school garden coordinators appreciated the support they received from the City of Tempe and wished for a better coordinated effort at the district level to support their gardens. Just as schools include sport facilities, they could dedicate some of their space for food production education. Although the city does not have control over the district, it could encourage the district to support school UA and also serve as a model by growing food in parks to create a blueprint of what it takes to develop and maintain publicly owned and operated UA sites: "We can grow so much in the desert…The City could model as a system for a school district…Like really create a roadmap of some kind for what that looks like."

The baseline assessment confirmed that Tempe UA was largely supported by individual-level and grassroots efforts, with minimal institutional support and market opportunities. According to Qiu et al. (2024), this would indicate that Tempe was in Phase I. The purpose of RQ2 was to identify the policies and programs that would help propel the city toward Phase II, where individual efforts are supported and driven by coherent institutional support and planning, and toward Phase III, where market-based economic factors and profitability support the upscaling of urban agriculture.

RQ2: Selected Practices from Other U.S. Cities to Inform Scaling Up UA in Tempe

Atlanta, Austin, Boston, Denver, Phoenix and Salt Lake City have had noteworthy successes with UA initiatives and programs, of which many can provide inspiration for comparable and aspirational cities. The City of Atlanta invested significant resources to grow and coordinate UA. It launched AgLanta, the city's initiative for UA and local food businesses with the goal of 100% of Atlanta residents living within a half-mile of affordable fresh food (AgLanta, n.d.). The initiative also provides the option for residents to convert vacant lots into community gardens. AgLanta was selected by the project team to inform scaling up urban agriculture in Tempe, for its coherent and ambitious vision and planning to increase food access. The City of Austin introduced the Healthy Corner Stores initiative in 2015, helping bring fresh and local produce from City-approved farms to convenience stores in neighborhoods with high rates of food insecurity (Janda & van den Berg, 2020). This initiative was selected by the project team for its focus on food insecurity reduction. The City of Boston Office of Urban Agriculture, "GrowBoston," hosts a community garden and urban directory, which counts 112 community gardens and 18 urban farms across the city's neighborhoods in 2025 (City of Boston, 2025). One urban farm, Eastie Farm, operates sev-

eral community gardens, partners with local schools to provide infrastructure for school gardens and educational programs for students, and serves as a community space where residents can gather (Eastie Farm, 2025). It was selected by the project team to inform Tempe's future planning for its focus on community development and garden education. Huerta Urbana was a Denver-based initiative selected by the project team for its impacts on workforce development. Created in 2020, the agricultural social enterprise trains families in local food production and distribution, supports them with a stipend, and provides a Colorado State University Beginner Market Farmer Training Certificate (Focus Points Family Resource Center, 2025). In Salt Lake City, the SLC Share program was selected to inform Tempe's planning because of the many fruit trees in the city that remain unpicked (especially citruses), and because of the program's focus on food security and workforce development. SLC FruitShare allows residents to register their fruit trees to receive maintenance support; the fruits are picked by volunteers and shared between the tree owner, the volunteers, and community food banks (slcGreen Blog, 2019).

Additional UA initiatives were selected in Phoenix because Tempe is part of its metropolitan area, and the adoption of similar municipal initiatives through tailored governance strategies could increase the initiatives' impact (Liu, 2025). First, the Phoenix backyard gardening project, an American Rescue Plan Act-funded initiative, allows LI/LA populations to apply for free installation of a backyard gardening system with educational support over the course of a year (City of Phoenix, n.d.). The team also selected Garfield's Garden on the Corner (GGC), a school garden at an elementary school that provides education on health, gardening, cooking and nutrition, and offers food bags to families (Edible Schoolyard Project, 2025). Both the backyard gardening program and the GCC were selected for their impact on food security and education. The gardening programs of the TigerMountain Foundation were the third initiative selected in Phoenix, for their focus on food security and workforce development. They work in challenged communities experiencing high rates of food insecurity and incarceration to provide garden work through shared use of community gardens, incubator farms, and other landscaping initiatives.

In total, eight initiatives from other cities were selected by the project team based on alignment with the results of the baseline assessment and the project team's initial priorities for food security, workforce development, and education (Appendix H). Two members of our research team presented the initiatives during workshop #1. Sixty participants interacted with the posters and voted for their preferred initiatives. The initiative that garnered the most votes was the Phoenix Backyard Garden, likely due to preexisting knowledge of the program, which many participants mentioned to the research team. The second most popular initiative, SLC Fruit Share, got interest due to the high number of established citrus trees that often remain unpicked around Tempe neighborhoods. Participants were excited about the idea of saving the fruit from waste, reducing backyard pests attracted to the unpicked fruit, and allocating it to those in need.

Policy Recommendations

The project team and Tempe residents who participated in the community survey and workshops cooperated to create 10 recommendations to inform future UA and food planning for the City of Tempe. Their recommendations directly align with priorities from Tempe's plans for sustainability and resilience. If implemented, each recommendation would contribute to scaling up UA in Tempe by enhancing individual, institutional, and economic drivers (Phases I, II, and III) (Table 1).

Discussion

This paper presents the detailed process through which city government staff, researchers, local organizations, UA practitioners, and residents from Tempe high-priority equity zones cooperated to identify strategies to scale up urban agriculture. We detailed the specific steps taken to involve residents, especially those from LI/LA populations. These residents informed our baseline assessment evaluating the current state of UA in Tempe and were decision makers in designing the policy and program recommendations to support the growth, diversity, productivity and capacity of existing

Table 1. Pathways to Scale Up Urban Agriculture in Tempe, Arizona, Through 10 Policy and Program Recommendations

Phase I: Individual Drivers	Phase II: Institutional Drivers	Phase III: Economic Drivers
Recommendation #1: Create a Tempe Food Action Plan rooted in community outreach and engagement.		
Residents gather and reflect on their vision for local food and propose goals to work towards. They gain knowledge about city governance.	The City initiates accelerators in alignment with residents' goals and priorities: zoning regulations, urban food policy, tax incentives, subsidies, etc.	The Food Action Plan may include goals supporting growth of local food markets; e.g., through public procurement or by incentivizing residents and local businesses to buy local food.
Recommendation #2: Increase urban agriculture visibility by growing in public spaces.		
Individual stakeholders learn about local foods and participate in public urban agriculture projects.	The City experiments with integrating food production spaces in public spaces and catalyzes future efforts. It helps transform social norms around where food can and should be grown. Zoning regulations become more inclusive of urban agriculture.	The visibility of urban agriculture projects serves as marketing and promotion opportunities for local farms and food businesses.
Recommendation #3: Collaborate with neighboring cities to expand some of their successful programs.		
Rather than being city- specific, resources, infrastructures, knowledge, and training opportunities are scaled across the region.	Partnership between cities allows for larger funding applications and more impactful projects. County- level urban planning guidelines help implement coordinated food strategies.	County-level guidelines and infrastructures facilitate growth opportunities and markets for urban food businesses.
Recommendation #4: Support gardeners and urban farmers through extension services and technical assistance to educate and to build networks.		
The City community liaison serves as a resource for individuals and facilitates their learning, experimenting, and networking opportunities.	The City community liaison facilitates social and culture norm shifting towards greater acceptance of food production experimentation.	Urban farming is valued as entrepreneurship, and urban farmers get opportunities to sell their produce in their neighborhoods and to local businesses.
Recommendation #5: Implement a fruit-sharing program.		
Participants improve their knowledge of fruit tree production cycles, maintenance, irrigation, pruning, and picking techniques. Tree owners are recognized for their participation in producing ecosystem services and supporting food security.	A plan to plant, maintain, and harvest fruit trees in public areas is created and integrated into urban planning.	New food business ventures are created to make use of fruit surplus.
Recommendation #6: Create viable workforce development options.		
Urban agriculture training is available from K-12 to college, for career change, and for seniors.	Local urban agriculture degrees provide a pathway to work with city park services, and urban agriculture careers are increasingly perceived as viable career paths.	Local growers have access to more professional training and are involved in training new urban growers, which helps diversify their revenues and provides opportunities for marketing and promotion.
Recommendation #7: Work closely with the Tempe school districts to promote school gardens and cooking.		
Empty school grounds are made available as arable land to create school gardens that serve as educational opportunities for students, their families, teachers, and staff.	The City works with residents and school districts to develop and implement roadmaps for specific schools, and provides dedicated funding and resources for school gardens.	Schools partner with local farms to offer CSA to families, teachers, and school staff.

Table 1, continued.

Table 1, continued.

Phase I: Individual Drivers	Phase II: Institutional Drivers	Phase III: Economic Drivers
Recommendation #8: Expand existing grants to have food-specific options.		
Residents' knowledge of existing grants improves, along with their grant application literacy, and the number of food-related applications increases.	Funding available for local urban agriculture and food projects is increased.	Funding dedicated to local food and agriculture entrepreneurship supports the growth of the sector.
Recommendation #9: Support rainwater harvesting and expand rebates for smart irrigation.		
Smart irrigation and water harvesting knowledge increases, helping to control the use of flood irrigation and water waste due to poor maintenance of irrigation systems, and helping to promote safe water harvesting.	The City provides discounts on water used for food production that is targeted for personal consumption and local markets.	Special water pricing for urban agriculture helps businesses become profitable faster. The use of smart irrigation techniques encourages them to grow native crops that thrive locally, and to develop new markets.
Recommendation #10: Center equity and uphold Indigenous Peoples and knowledge.		
Access to knowledge of native crops and usages allows individuals to adjust their personal consumption and production choices, and to create new networks to communicate these transformations.	Urban food policy centers equity and indigenous knowledge as fundamental norms for local food planning and activities. Indigenous plant names are integrated into public areas.	Local indigenous farmers and chefs are integrated into the City's food procurement plan.

operations by strengthening institutional support and economic opportunities. In focusing on equitable engagement, our work echoes previous recommendations by researchers and practitioners urging those involved in food planning to design inclusive processes (Clark et al., 2017; Raja et al., 2018; Sloane et al., 2019). At the onset of the project, the grant proposal was co-developed by the project team, which included researchers, city governance staff, and local community organizations with strong ties to the traditionally underserved neighborhoods involved. We worked together to frame the project with community members, many of whom spoke English as a second language and had limited experience in policy making, to assess the current situation, envision where the community would like to be, identify opportunities to improve the current situation, and propose recommendations to scale up urban agriculture in Tempe.

Although we did not formally conduct evaluation of the community engagement process, multiple indicators—recurring resident participation (from the baseline assessment activities to the last workshop), iterative refining of recommendations through feedback, and increasing solicitation of the City for food-related projects—suggested that the participatory process was effective in shaping outcomes and building a sense of community ownership. The research team attributes this success primarily to the work of local community organizations, especially to the community health workers (CHWs) trained in community-building leadership, education, and health promotion. CHWs' core competences, including communication, relationship building, and outreach (Unlimited Potential, 2025), facilitated meaningful connections with the participants, and fostered the project's genuine aspiration to what has been called "authentic participation" (Sloane et al., 2019, p. 206). We believe that this project initiated a political space of public exchange around the municipal food system, that holds the potential to increase feelings of political efficacy over time (Levkoe, 2011; McIvor & Hale, 2015). To optimize participation, we encourage other city staff and researchers to work with organizations that have meaningful connections and regularly work with the communities they seek to engage, and to ensure they have leadership in project design, participant recruitment, and data collection and analysis as we strived to do in this work. Continuous reflective engagement and debriefing sessions after each workshop also facilitated collaboration, alignment, and learning for all project team members. One such learning included

the recognition that the neighborhoods involved in this research are at a high risk of "green gentrification" due to their strategic location in Tempe. As cities seek to engage LI/LA neighborhoods residents in food policy planning, they need to guarantee that residents will be able to afford to continue living in the spaces they are helping transform (Anguelovski et al, 2022; Oscilowicz et al., 2021).

In addition to nurturing relationships and reflexivity, communication and logistics are essential to the success of participatory planning workshops. Before and between events, maintaining open lines of multi-media communication (social media, phone, email, flyers, canvassing, etc.) helps engage the residents where they are at. For the events, providing clear instructions on running the show, hosting planning meetings with all facilitators, co-developing agendas, and creating facilitation guides help to manage expectations for all facilitators and adjust to the inevitable unexpected. Providing translators, childcare, and food and refreshments on site are assets, and, along with previous researchers, we recommend using multiple tools to engage participants and collect their opinions and feedback, such as written text, pictures, stickers, drawings, color pencils and markers, charts, posters, envelopes, sticky notes, and produce and plants (Freedgood & Fydenkevez, 2017). Having some produce and a few local plants available can be particularly helpful when people are familiar with them but don't know their names or how to cook them.

Because several project limitations emerged, improvements could be made to strengthen community ownership over the research question, design, and analysis. First, although the grant proposal was designed through a partnership between city staff, researchers, and community organizations, investing in listening sessions and resident surveys prior to proposal design would help better tailor the project to residents' aspirations; for example, by involving college students perhaps as part of capstone research work. Second, although we did validate emerging themes with the community members, the data analysis process for RQ1 could have benefited from more community involvement, by hosting collaborative analysis workshops to make sense of the interview and survey data, and building capacity for analysis through mini-training to enhance reciprocal learning (Cargo & Mercer, 2008; Pain & Francis, 2003). As food policy can be intimidating, we recommend partnering with organizations that provide policy literacy training to obtain more sustainable results. The trainings could be easily included in the planning workshops, thus helping to democratize the food policy process and to lead to more resilient and desirable systems.

For the City of Tempe, the project participatory planning process helped secure another source of funding from USDA (the Local Food Promotion Program) that provided free commercial kitchen space in the Escalante neighborhood and bilingual business development training to Tempe residents. The project team also continues looking for more sources of funding to implement the recommendations, but challenges remain to better align the existing municipal plans, and the various but specific needs expressed by the residents. Tempe has set objectives to support and expand UA in its land use and community design goals (City of Tempe, 2013), but none of the current city council strategic priorities or performance measures explicitly include food policy. As such, there is a gap between the City's plans and the indicators it uses to track its progress. As of December 2025, the City Council has prioritized homelessness, feeling of safety in parks and neighborhoods, and tree and shade canopy (City of Tempe, 2025b), most of which could be supported by well-designed UA initiatives (Gibbins, 2019; Gorham et al., 2009; Hale et al., 2011; Mok et al., 2014; Siegner et al., 2018). Consistent with the literature and with our recommendation #1, we reiterate the importance for cities which seek to scale up UA to integrate food into their strategic priorities, with clearly articulated goals, and implementation metrics appropriate to their performance measures (Freudenberg et al., 2018; Hodgson et al., 2011).

For Arizona cities, however, as land pressure and water scarcity intensify, making such a commitment to UA is not evident, especially in light of recent municipal budget cuts (Shappell, 2024). Urban agriculture can be water-efficient, especially when it incorporates drip irrigation, rainwater harvesting, and desert-adapted crops

(Dhakal et al., 2015; Nabhan et al., 2020; Rufí-Salís et al., 2020), as many Tempe sites are already doing. Moreover, unlike conventional landscaping, which provides limited public benefit, food-producing landscapes can have many benefits, such as nutrition, education, climate mitigation, and community well-being. In our research, social cohesion and community emerged as core themes of the baseline assessment, consistent with the literature (Kirby et al., 2021; Petit-Boix & Apul, 2018; Veen et al., 2016). Residents recurrently talked about the opportunity to open public spaces where they could grow food, access fresh produce, learn from each other, engage, build relationships, volunteer, and share the workload. This translated into several recommendations: #2 (growing in public spaces), #4 (hiring a community liaison to help connect existing initiatives and residents to resources and to one another), #5 (creating a fruit-sharing program), and #7 (expanding school gardening programs).

The need for community reflects a larger loneliness concern in Arizona, ranked the ninth most isolated state in the country (Sepulveda & Barraza, 2024) and where participation in actions that build community and social cohesion is traditionally very low (Adams et al., 2016; Center for the future of Arizona, 2023). We can envision that further investments in community gardens, urban farms, and school gardens would foster networks, create a community of practice (Lave & Wenger, 1991), and strengthen connectivity, all contributing to civic health, social resilience, and a culture of care (Curry, 2002; Giraud, 2021; Hodbod et al., 2024; Joshi & Wende, 2022; Williams & Sharp, 2022). For Arizona cities, scaling up UA by prioritizing community food access and production could help increase trust in municipal institutions and serve as an example of pro-connection public policy in response to the country's loneliness epidemic (Office of the Surgeon General, 2023).

Conclusion

This research set out to explore how early-stage participatory planning can support the development of urban agriculture in Tempe, Arizona. Through a Participatory Action Research approach, we engaged residents from neighborhoods experiencing high food insecurity alongside local practitioners, students, and city officials to assess the current state of UA, document barriers and opportunities, and co-develop ten policy recommendations for scaling up UA in alignment with community needs and the City's sustainability and resilience goals. Our findings confirm that Tempe UA remains at an early stage, with dispersed grassroots efforts and limited institutional coordination, Phase I of a scaling up framework (Qiu et al., 2024). Nevertheless, research participants emphasized the transformative potential of UA to improve food security, support education and workforce development, and foster a stronger sense of community. By grounding planning in the voices of underrepresented residents, the project helped to bridge a critical gap between Tempe's sustainability ambitions and its current lack of food-related policy mechanisms.

The study underscores that equitable UA planning depends not only on participatory engagement but also on the cultivation of long-term relationships between residents and city institutions. Community health workers and local organizations were instrumental in building trust and facilitating authentic participation among residents, suggesting that similar partnerships are essential for other municipalities pursuing equity-centered food governance. This work details practices to make participatory urban food planning workshops engaging (e.g., providing childcare, food, and adjusting to different communication styles) and yielding sustainable results (e.g., providing training in local policy), which can serve practitioners and scholars who wish to engage in participatory planning for early-stage urban food policy. Ultimately, this participatory process represents an important step toward democratizing food policy, strengthening local capacity for collective action, and fostering a culture of connection.

As Arizona cities face growing pressures from land conversion and water scarcity, water-smart UA offers an opportunity to reimagine public spaces as productive, educational, and socially connective environments offering cross-cutting benefits such as heat mitigation, biodiversity support, crime reduction, and public

trust. In a time marked by rising isolation, ecological stress, and civic distrust, urban agriculture offers more than food—it offers infrastructure for belonging and care. 

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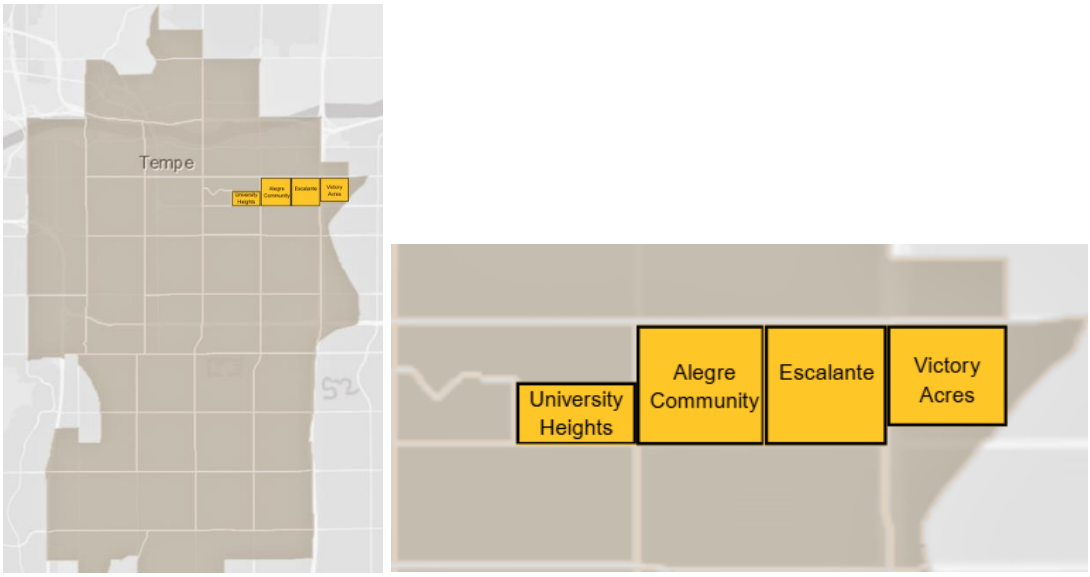
Appendix A. Project neighborhoods: University Heights, Alegre Community, Escalante, and Victory Acres



These four neighborhoods are part of three census tracts: 3191.03 (University Heights), 3192.01 (Alegre Community and Escalante), and 3193 (Victory Acres). They are classified as Equity Zones, which are areas of the City of Tempe identified as having above-average crime concentrations and socioeconomic inequities and public health concerns (indicators include CDC vulnerability index, crime concentration, rate of rental tenure over 50%, mental health distress, low rate of physical activity, asthma prevalence, and informal housing encampment). These low-income tracts also have a significant share of residents more than ½ mile from the nearest supermarket, according to the USDA Food Access Research Atlas (USDA ERS, 2025a). University Heights, Alegre Community and Escalante are the highest priority zones in the city (City of Tempe, 2023b).

	Census Tract 3191.03	Census Tract 3192.01	Census Tract 3193
Population	4,800	7,309	2,977
Household median income	$49,795	$54,366	$51,977
Percent of population below 150% poverty level	56%	52.7%	51%
Minority rate	64%	67%	55%
Percent of population over 18 with no high school diploma	8%	31%	28%
Percent of population over 18 with no vehicle	26%	13%	14%

Sources: American Community Survey (2019–2023), CDC 2020 Social Vulnerability Index (AZGeo Open Data, n.d.; City of Tempe, 2025c)

Appendix B. Definitions of Project Core Priorities

Core priorities	Definition	References
Food security	According to the USDA, food security is a household-level economic and social condition of limited or uncertain access to adequate food. Additionally, the USDA distinguishes ranges of food security: high food security, marginal food security, low food security, and very low food security.	(USDA ERS, 2025b)
Education	Education is the continuous process of developing knowledge, abilities, morals, and attitudes through learning. It takes place in settings both traditional (schools, universities, vocational training) and non-traditional (workplaces, personal research, lived experiences), and promotes personal and societal growth through the practices of analysis, creativity, and continuous learning.	(Jackson, 2011; Schuller et al., 2004)
Workforce development	Workforce development prepares individuals for employment by providing opportunities to learn and practice the skills necessary for success in the job market. It aims to enhance the skills and employability of workers. It is implemented through practical application through programs such as vocational training, education, and career counseling.	(Goldsmith & Coleman, 2022; Schrock, 2013)
Water security	Water security is the capacity to sustainably manage and govern water resources in a way that ensures reliable access to clean, affordable water, supports ecological health, and protects against emerging threats such as climate change, infrastructure failure, and environmental degradation.	(Cook & Bakker, 2012; Hoekstra & Mekonnen, 2012; UN-Water Task Force on Water Security, 2013)

Appendix C. Tempe Urban Agriculture Practitioner Interview Questionnaire

1 – Can you share your experience farming/growing food in the City of Tempe? What do/did you grow? What do/did you raise?

2 – What is/were your relationships with the city?

3 – What is/was the scale and acreage?

4 – Do you market/sell your production? Describe

5 – Do you use some for your own consumption?

6 – What are the main challenges you face? What are some of the challenges/barriers that you have faced and how did you overcome them?

7 – Which kind of support could you benefit from (especially from the City of Tempe)?

8 – How do you get your water? How does the current water situation impact your long-term water security?

9 – Do you use any low-water consumption growing technique? What's your average water bill?

10 – How is your operation zoned?

11 – Are there any zoning ordinances going in the way of growing or marketing your products?

Appendix D. Food Need Assessment Questionnaire

1) In general, where do you purchase or obtain most of your food? Choose the 3 most frequent places that you visit.
   - Food Bank / Soup Kitchen
   - Farmers Market
   - Convenience Store (like QuickTrip)
   - Drug Store / Pharmacy (like CVS)
   - Online (Amazon / Meal Delivery Service)
   - Community Garden
   - I grow my own food
   - Butcher Shop / Carnicerias
   - Ethnic Markets (such as Asian, Kosher Markets…)
   - Food Trucks
   - Grocery Store (like Walmart, Fry's, Food City, Costco, Sprouts, etc.)

2) What kind of things are important to you when you shop for food?
   - Location (the food is near my home/convenient)
   - Cost (the food is affordable)
   - Quality (the food is fresh and tastes good)
   - Cultural Availability (I can find what I need/want)

3) How satisfied are you with your options to find healthy food?
   - Satisfied
   - Neutral
   - Unsatisfied

4) What type of barriers or challenges do you have when it comes to finding healthy food? Select all that apply.
   - It is too expensive for my budget
   - I don't know how to cook or eat it
   - I don’t have time to cook or prepare it
   - I don't know where to find it
   - I lack access to basic kitchen equipment (tools needed to prepare meals)
   - Physical conditions/limitations at a personal level
   - No Barriers
   - Not a priority - other priorities, such as:

5) What other considerations are important to you when it comes to food?
   - Cultural traditions
   - Health-related dietary needs (such as pre-diabetes)
   - Alignment with personal beliefs
   - Plant-based
   - Comfort
   - None of the above

6) I know how to find:
   - Traditional foods that matter to me and my culture
   - Community garden near me
   - Community orchard near me
   - Another place to find healthy food near me

6) Do you grow any of your own food?
   - Yes - at home
   - Yes - at a community garden

Yes - at another location:

No

7) If you do grow some of your own food, what do you grow?

Vegetables

Fruits

Herbs

Edible desert plants / desert-adapted plants

I don't grow any of my own food

8) Do you cook at home?

Yes

No

9) Do you or any members of your household work in a food business?

Yes

No

10) Which types of urban agriculture would you like to see in your neighborhood? Select up to 3 types that you think would be the most beneficial.

Community garden

Community orchard / food forest

School garden

Edible landscapes - in public places, like parks

Edible landscapes - where I live (yards, common spaces in apartment complexes)

Urban farms

Farmers market

11) If you think it would be beneficial to have more urban agriculture in the city, what might be some of the reasons? Select all that apply.

Improving local food access

Growing food for personal use

Growing food for sale

Donating food for community needs

Teaching gardening skills

Meeting new people

Building a feeling of community

Fun and relaxation

Beautifying the neighborhood

Environmental benefits, like promoting pollinator habitats

Creating new places to pick food or forage

Building gardening or farming skills

Preventing food waste

Overall well-being (physical, spiritual, social, etc.)

12) Did you know there is a community garden at Escalante?

Yes

No

13) If there was an urban agriculture site established near you, would you be interested in any of the following activities? Select all that apply.

Growing food for sale / starting your own food business

Composting food scraps

Helping to design the site

Donating supplies or money to the site

Helping to set up the site (e.g., creating garden beds)
Teaching a cooking class / attending a cooking class
Teaching a garden class / attending a garden class
Volunteering to maintain the site
Share with the community (grow and give)
Other:

14) If there is open/vacant space in the city, how do you think it should be used? What would you like to find there?
Food / Urban Agriculture
Recreation
Other:

15) How beneficial do you think nutrition and cooking classes are in shared spaces?
Not at all beneficial
Not really beneficial
Mostly beneficial
Beneficial
Very beneficial

16) What do you want to know about food?
Cooking / recipes
Fiber
Medicine
Edible native desert plants and desert-adapted plants
Eating seasonally
Food entrepreneurship / food business
Health/nutrition
Food waste diversion / composting
Other:

17) What is your vision for your neighborhood related to food?
To explore new ideas about food
To have the ability to support each other
To have the ability to be more self-sufficient
To learn new things about growing food
To get to know my neighbors
To explore new cultural ideas and/or foods
I don't know / I don't relate to my neighborhood
Other:

18) "We worried whether our food would run out before we got money to buy more." Please respond whether the statement was often true, sometimes true, or never true for you in the last 12 months.
Often true
Sometimes true
Never true, in the last 12 months
I don't know

19) "The food we bought just didn't last, and we didn't have money to get more." Please respond whether the statement was often true, sometimes true, or never true for you in the last 12 months.
Often true
Sometimes true
Never true, in the last 12 months
I don't know

20) Language Preference

Spanish
English
Other:

21) Age Group
Less than 18 years old
18–25
26–35
36–45
Prefer not to respond

22) Race/Ethnicity
White
Black or African American
American Indian or Alaskan Native
Asian
Native Hawaiian or Other Pacific Islander
Hispanic
Other:
Prefer not to respond

23) Gender Identity
Woman
Man
Transgender
Non-binary / non-conforming
Other:
Prefer not to respond

24) Neighborhood of Residence
Escalante
Alegre
La Victoria
Other:

Appendix E. Food Needs Assessment Demographics

Food Needs Assessment (N = 86)

	Number	Percent
Language Preference		
Spanish	41	48%
English	44	51%
Other:	0	0%
Prefer not to respond	1	1%
Age group		
Less than 18 years old	2	2%
18–25	10	12%
26–35	19	22%
36–45	17	20%
46–55	16	19%
56–65	11	13%
66 years old or older	11	13%
Prefer not to respond	0	0%
Race / Ethnicity		
White	20	23%
Black or African American	5	6%
American Indian or Alaskan Native	5	6%
Asian	7	8%
Native Hawaiian or Other Pacific Islander	2	2%
Hispanic	52	60%
Other:	0	0%
Prefer not to respond	1	1%
Gender Identity		
Woman	63	73%
Man	21	24%
Transgender	0	0%
Non-binary / non-conforming	0	0%
Other:	0	0%
Prefer not to respond	2	2%
Neighborhood of Residence		
Escalante	40	47%
Alegre	8	9%
La Victoria	18	21%
N/A	20	23%

Appendix F. Salt Lake City Interview Questions

1. In reviewing Salt Lake City's Comprehensive Master Plan, *Plan Salt Lake*, and comparing it to each community's master plan, we saw a varying focus on urban agriculture across the different community plans. We are curious about the challenges and achievements you've faced in your journey to become a model city for urban agriculture and food systems. In particular, how do you find the individual communities—each with their own unique master plan—incorporate the larger vision of *Plan Salt Lake* into their own community? What are the steps and stages a city like Tempe can look towards as we seek to support our local food system and local food production? What were the community engagement strategies used during these steps? Did you find that there was existing community buy-in, or did you find that people needed to be convinced of the benefits of urban agriculture? How about internally—do you feel that other departments recognize the value of urban agriculture and are willing to partner on these initiatives?
2. Of the different cities we're interviewing, Salt Lake City's Green City Growers has taken a unique step by partnering with an outside company, Wasatch Community Gardens. How did this relationship come about? Are there any aspects of this partnership that you find especially helpful for meeting the city's urban agriculture goals? Are there any issues that you had to work through in implementing this partnership?
3. Wasatch Community Gardens organic standards are also a unique requirement of urban agriculture initiatives. How has it been to get the community on-board with utilizing organic practices? Did you find you needed to do community outreach or educational seminars to highlight what makes organic gardening different from conventional gardening? Does the community see added value in these organic practices?
4. The City of Tempe is particularly interested in integration of urban agriculture as we do not have a lot of vacant land like our neighbor Phoenix. This would likely involve integration of urban agriculture into landscaping/parks, schools, residential yards, and institutional sites, like community resilience hubs. Several of Salt Lake City's Community Master Plans have addressed this issue, such as Sugar House purchasing interior block areas for urban agriculture, or East Bench looking to use school grounds as public open spaces. Do you know of any programs/ initiatives/ projects in these communities that Tempe could look towards as an example of urban agriculture success, especially with our focus of integrating urban agriculture into public, institutional and residential spaces? Are there any communities and/or projects that stand out to you as exemplary? How might we get more information on these communities and work being done at the neighborhood level?
5. Westside's community master plan takes specific aim at increasing the quantity of fruits and vegetables consumed in the community, as well as addressing the issue of food deserts. Can you talk about this initiative? Is urban agriculture helping to address this issue? What strategies have you used to address food insecurity beyond urban agriculture? Have you done anything related to workforce development, food entrepreneurship training, or food business incubation? If so, what strategies have you used to ensure that you're reaching those who are most impacted by food insecurity?
6. This summer Utah's Governor noted that 100% of the state was facing drought conditions, putting it in a similar position as Arizona. As both Tempe and Salt Lake City share water conservation concerns, what might Tempe learn from Salt Lake City relating to water incentive programs in urban agriculture policies and programs? Does Salt Lake City subsidize water costs used for food production at all? Are there any pilots looking towards stormwater use?
7. Ag-tech is another focus of the City of Tempe, especially indoor agriculture due to the low availability of land in Tempe. I am curious if Salt Lake City has any glowing examples of indoor agriculture programs, projects, policies, or other ag-tech ventures Tempe can learn from?

Appendix G. Making Space Festival (Workshop #1), Spring 2023 (City of Tempe, 2024a)

An estimated 150 residents attended the festival, of whom about 60 interacted with the food posters. No demographic information was collected.

Event picture

Example of thematic poster presented to participants

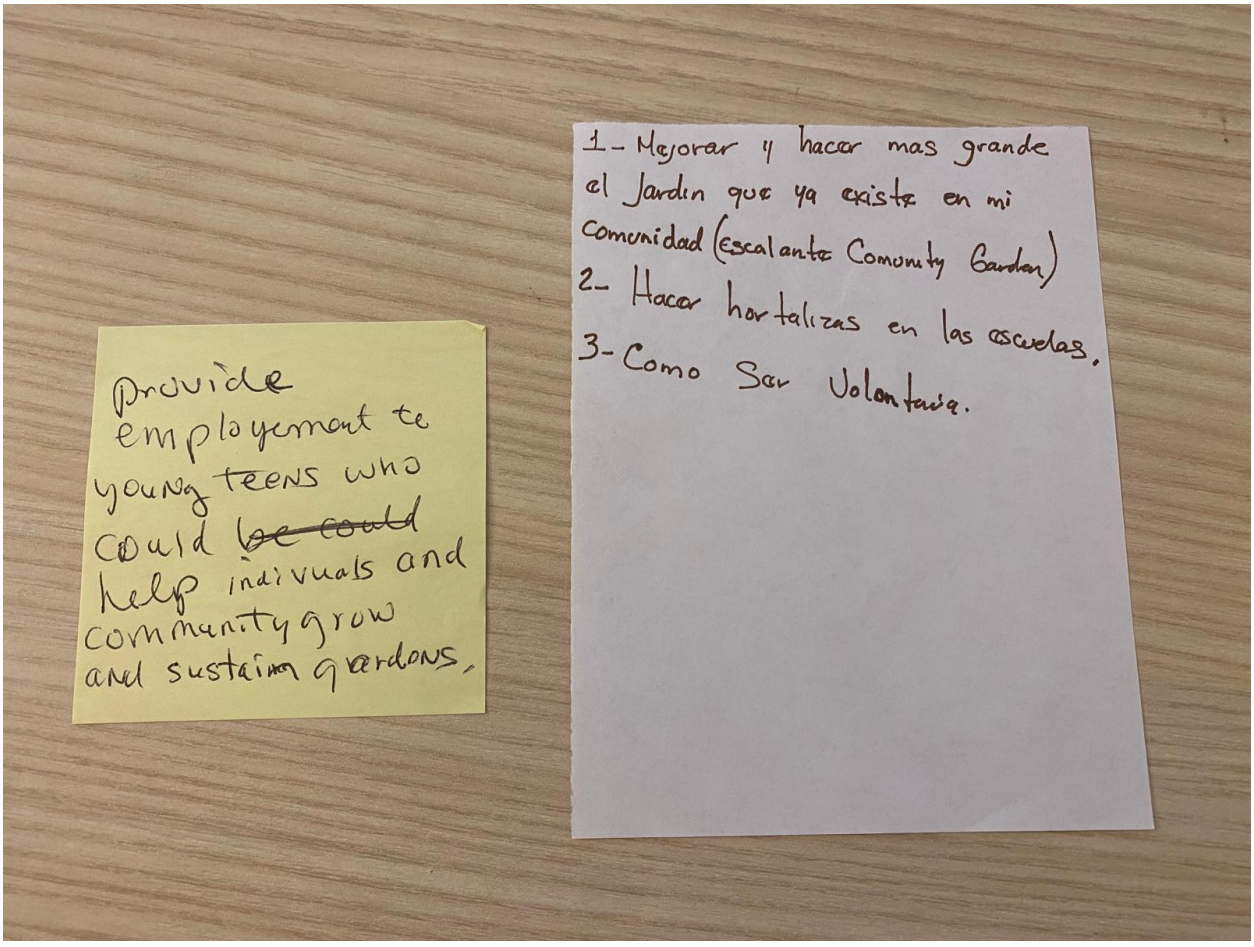
Appendix H. Selected UA Initiatives: Alignment with the Project and Residents' Votes

City	Name of initiative	Baseline assessment alignment	Project team priorities alignment	Number of votes
Atlanta	AgLanta	- Provides a coordinated plan	food security, education, workforce development	19
Austin	Healthy Corner Stores	- Increases options to access healthy food	food security	16
Boston	Eastie Farm	- Increases options to access healthy food - Operates community gardens - Supports school gardens and food education - Serves as a space for community learning and exchange	food security, workforce development, education	20
Denver	Huerta Urbana	- Increases options to access healthy food - Offers options for participants to grow and sell food	workforce development, education, food security	20
Phoenix	Phoenix Backyard Program	- Increases options to access healthy food - Offers options for participants to grow food	food security, education	28
	Garfield's Garden on the Corner	- Increases options to access healthy food - Offers food, health, and food systems education - Serves as a space for community learning and exchange	food security, education	21
	TigerMountain Foundation	- Increases options to access healthy food - Operates a community garden - Serves as a space for community learning and exchange	food security, workforce development	21
Salt Lake City	SLC FruitShare program	- Increases options to access healthy food - Creates opportunities for community learning and exchange	food security, workforce development	25

Appendix I. Image and Text Used to Discuss with Participants in Workshop #2 the Recommendation for Growing Food in Public Spaces

Illustration by Vidhya Nagarajan, published in *Chicago Magazine*, April 2, 2018 (Wetli, 2018).

Appendix J. Examples of Notes Left by Workshop #2 Participants in the Envelopes



The yellow Post-It:

provide employment to young teens who could help individuals and community grow and sustain gardens

The white paper (in Spanish):

1- Improve and increase the size of the garden that already exists in my community (Escalante Community Garden)
2- Create gardens in schools
3- How to volunteer

Appendix K. Workshop #2 Agenda and Workshop Facilitation Guide

Community Workshop June 22, 2023 | 5:30–6:30 PM | Escalante Community Center

Event Agenda

Day-of-Event Prep:

1. Facilitators Arrive (4:40–4:45 PM)
    A. Facilitators arrive at the Bro/Bravo at the Escalante Community Center. Facilitators will park in the ___ lot.
2. Facilitator Briefing & Introductions (4:45–4:55 PM)
    A. Facilitators will do introductions, recap table assignments, and review the final run-of-show.
3. **Workshop Set-up** (4:55–5:15 PM)
    A. Facilitators set up materials at tables, arrange the "gallery" of Resident Food Needs Assessment posters, and set up any required technical equipment (set up slide deck, etc.).

Participant Overview:

4. Workshop Participants Arrive (5:15–5:30 PM)
    A. Participants arrive at the Brio/Bravo room at the Escalante Community Center. Participants will park in the South lot.
    B. After participants sign in, they will be asked to review the Resident Food Needs Assessment posters and provide feedback on the identified findings.
        2. If participants don't get a chance to review the posters at this time, there will be additional opportunities throughout the event.
5. Workshop Welcome (5:30–5:35 PM)
    A. Team to welcome participants and provide an overview of the goals and key parts of the project.
    B. Group level setting – share definitions of key terms and the goals of the workshop with the participants.
    C. Discuss general housekeeping rules for the workshop.
6. Ice Breaker (5:35–5:40 PM)
    A. Facilitate ice breaker activity with participants within their small groups. Ask the following questions:
        i. Name
        ii. General location where they live in Tempe
        iii. One thing they love about where they live
        iv. A food they love

7. Food Needs Assessment Overview (5:40–5:45 PM)
    A. Provide an overview of the purpose, process, and key findings of the Resident Food Needs Assessment.
    B. Reference the "gallery" of findings, and encourage participants to denote their feedback / interest on the posters during a break or after the workshop portion of the event.
8. Introduce Policy Recommendations Activity (5:45–5:50 PM)
    A. Describe the purpose of the drafted policy recommendations, how they were created, and the role that they play in the project.
    B. Introduce the activity.
        i. [Think about the framing + instructions].
9. Policy Recommendations Activity (5:50–6:55 PM)
    A. Show picture to participants, present the idea of the recommendation, make time for translation
    B. Encourage participants to ask questions, provide feedback, share reflections. Give them different options to participate (speaking, envelope, post-it, drawing, etc.)
10. Wrap-Up and Next Steps (6:55–7:00 PM)
    A. Thank participants for their time and provide an overview of the next steps in the process
    B. Highlight post-workshop activities and resources (e.g., food + food demonstration, TCAA, Farm Express Bus giveaway)
    C. Remind participants to give feedback on the food needs assessment and to sign up to receive project updates/become involved in the next steps of the project.
11. Post-Workshop Activities (7:00–7: 30 PM)
    A. Food and cooking demonstration.
    B. TCAA resource table.
    C. Sun Produce Cooperative farm bag giveaway.

Workshop Facilitation Guide

Project Overview (Goals & Milestones)

- The project aims to expand food access, economic opportunity, and community well-being through the expansion of urban agriculture in Tempe.
- The project will 1) assess the current state of the Tempe food system, 2) identify residents' needs and goals relating to food, and 3) develop strategies to expand urban agriculture.
- The strategies to expand urban agriculture will be co-developed with Tempe community members, and community workshops will be used to get deeper feedback from community members on draft recommendations

Policy Recommendation Activity

Activity Overview (What's happening?)

Materials (What will we need?)

Guiding Questions (What are we asking?)

Recommendations 1 and 10

- Why do you think it would be valuable to have a food plan for the City of Tempe?
    - [Follow-Up Question]:
- Do you think that a food plan could be helpful in supporting Indigenous producers and farmers in the City of Tempe?
    - [Follow-up Question]:

Recommendations 7 and 3

- Do you think the City of Tempe should help schools to grow food?
    - [Follow-up Question]:
- What would it take for you to participate in a backyard gardening program?
    - [Follow-Up Question]:

Recommendations 4 and 5

- Would you be more willing to grow food if you had access to resources like technical support, workshop, and connections to other people growing food in Tempe?
    - [Follow-Up Question]:
- Explain what fruit share programs are, including what roles people fill in them: What would influence your decision to be a part of a fruit tree harvesting program?
    - [Follow-up Question]:

Recommendations 2 and 6

- Would you be interested in volunteering in or eating food from public food gardens? Why or why not? [Follow-Up Question]:
- If the City of Tempe provided free/low-cost cooking classes (including cooking with novel food items such as mesquite pods, prickly pear, and other native plants) what would influence your decision to participate in them?
    - [Follow-up Question]

Recommendations 8 and 9

- Do you have any concerns about the future of Arizona's water?
    - [Follow-up Question]
- Would grants that fund food growing and food business initiatives help you participate more in growing food activities?
    - Follow-up Question: Would you consider applying for such a grant yourself? Why/why not?

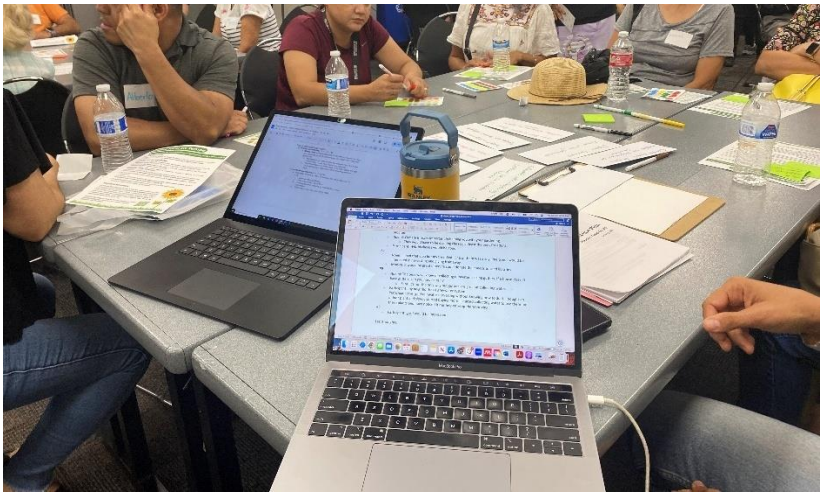
Materials Needed:

- ✓ Table materials (Boxes/Plastic containers for each table with post-it notes and markers)
- ✓ Stands for policy recommendations/tape
- ✓ Sign-in sheet with name/contact information/Photo release form/Several options/copies
- ✓ Roster for facilitators/note takers/ clarify data collection for each table (taking photos/computer notes/clip boards, collect sticky notes, etc., reporting expectations for UP)
- ✓ Agenda + Facilitator Guide (who is responsible for what section, table questions, a brief description of policy recommendations /simplified version)
- ✓ Resident Food Needs Posters (large format)
- ✓ Easels to display posters
- ✓ Resident food needs assessment findings handout
- ✓ Groceries + compostable plates/utensils

Appendix L. Workshop #2 Pictures

Beginning of the workshop, participants joining different tables

Policy recommendation activity



While dinner is served, a cooking demonstration takes place to elevate ingredients produced in the backyard of one of the moderators.

Appendix M. Workshop #3

Day-of Event logistics email

Thank you for participating in the **Community Food Showcase**, which will take place on **Saturday, January 20th** from **10–12 PM.** Below is some information about day-of-event logistics:

- **Event Time:** 10 AM – 12 PM
    - **Set-up:** Please plan to arrive between **8:00–8:30 AM** to help set up for the event.
    - **Check-in:** At **9:00 AM**, we will have a short group meeting for everyone on the event team to introduce themselves. We will have 30+ people facilitating activities and staffing the event, including City staff and community partners.
    - **Run time:** The event will run from 10 AM to 12 PM.
    - **Break down:** We will clean up from the event from **12–1:30 PM**.
- **Location:** EnVision Center (1310 E. Apache Blvd.)
    - **Parking:** Parking for event staff and attendees will be available in the former Park and Ride lot on the **southwest corner of Lemon St. & Dorsey Ln.** SRO will place signage to indicate the parking area, and Eric will help to direct traffic.
    - **Site Map:** Linked here **is the site map** for the event, which indicates the parking area and location of participants' booths.
        - One note – the event will be indoor/outdoor, with some tables set up on the south/east sides of the building and other tables set up inside. As of right now, it looks like the weather will be cloudy, with a low of 51 degrees (during set-up) and a high of 67 (at 12pm). Please note whether your activity is inside or outside and dress appropriately.
- **Materials:**
    - **Table/chairs:** SRO ordered tables/chairs from the Phoenix ToolBank. **Please see the attached attendee list** for the total table/chair count – we ordered 30 tables and 52 chairs. There are also some additional chairs/tables onsite if we end up needing any extra.
    - **Tablecloths:** If you have one, please bring an organization-specific tablecloth. If you don't have one, we can provide you with a plain black tablecloth. We have 30 plain black tablecloths to borrow for the event.
    - **Tabling supplies:** Please review your list of materials to bring, linked here.
- **Day-of-Event Contact Information:**
    - If you need anything from me leading up to the event, please contact me at XXX-XXX-XXXX or via email at XXXXX@tempe.gov.
    - To reach me on the day of the event, please call/text my cell number – XXX-XXX-XXXX

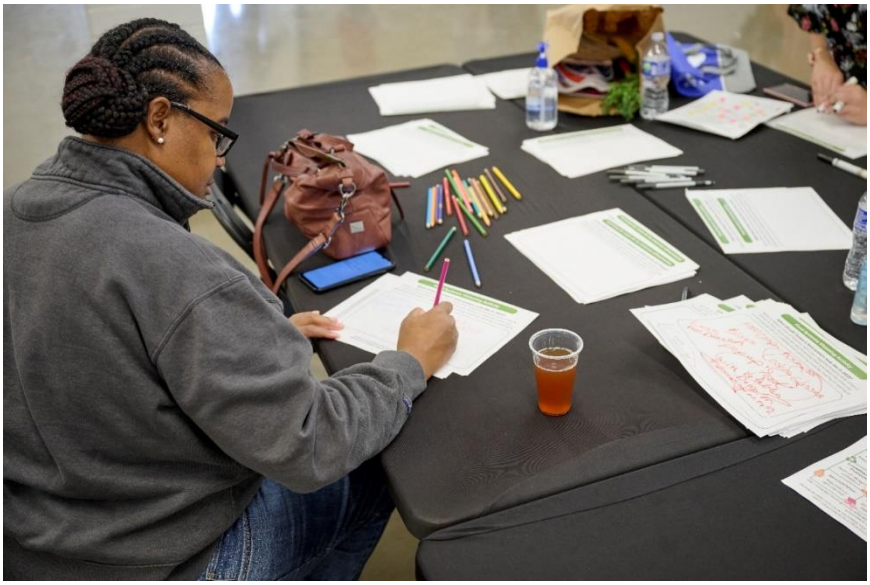
Please let me know if you have any questions about the above information— I'm happy to hop on a call to clarify things or answer any questions. Thanks again for being part of this event!

Participants were recruited by Tempe's office of sustainability, partner community organizations, and members of the research team via emails, community centers, event flyers (see below) and social media posts.

Workshop participants queue to receive their free bag of produce

Participants walk through the activity booths

Food system visioning activity: drawing activity in which people draw the future of what the city would look like once some of the recommendations are implemented



Tempe food asset map activity: interactive activity presenting resources on existing food initiatives

Guiding Questions:

- Have you been to any of the locations on the map? / ¿Ha estado en alguno de los lugares del mapa?
- Is anything missing from this map? / ¿Le falta algo a este mapa?
- What are some important places where you interact with food? These are places where you might grow, connect with, eat, buy, grow, cook, and share food. This could be anything from a favorite restaurant to your neighbor's garden!) / ¿Cuáles son algunos de los lugares importantes en los que encuentra alimentos? Estos son lugares donde usted puede crecer,comer, comprar, cultivar, cocinar y compartir alimenticios. Pueden ser desde su restaurante favorito hasta el jardín de su vecino).
- Did you learn about any new food assets by looking at the map? / ¿Ha descubierto nuevos recursos alimenticios al observar el mapa?

Map Key:

- Tempe City Boundary / Límite municipal de Tempe
- Compost Site / Lugar de compostaje
- School Gardens / Huertos escolares
- Community Gardens / Huertos comunitarios
- Seed Libraries / Almacenes de semillas
- Produce Bag Pick-Up Locations / Lugares de entrega de bolsas con fruta y verdura
- Farm Express Bus Stops / Lugares de parada del autobús "Farm Express"
- Food Pantry & Emergency Food Access Locations / Lugares de entrega de despensas de alimentos incluyendo de emergencia