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Applying the 5Ps of Cultural Ecosystem Services for Urban Agricultural and Natural Resources Programming

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Abstract. Beyond adapting extension programs for an urban audience, Urban Extension strives to reach an underserved audience that hugely overlaps with marginalized populations. This means that cultural competence is crucial for successful program implementation. The following article outlines the application of the 5P framework of Cultural Ecosystem Services as a tool for laying out the base to a culturally competent extension program. Although originally intended for urban planners, when applied widely for program development it allows accounting for place, past, people, practices, and purposes in a simple manner without overlooking importance context pertaining the target audience.

INTRODUCTION

Urban Extension encompasses programs and resources designed for urban and suburban audiences, specifically tailored to address the distinct challenges present within the interconnected urban-rural gradient (Fox et al., 2017). Beyond adapting Extension programs to incorporate local priorities, Urban Extension targets an underserved, diverse audience (Fox et al., 2017). Creating opportunities to increase education, a sense of self efficacy, and social integration of urban audiences is crucial to foster individual and shared value for natural resources and agriculture within urban communities (Nelson et al., 2022). Ensuring cultural competence in these opportunities is essential; otherwise, Extension educators may struggle to engage a significant portion of the urban population—particularly those who have historically been excluded from such programs (Grabowski et al., 2019).

Incorporating socio-ecological concepts into traditional natural resources and agricultural programming can allow for more effective program implementation (Warren, 2018). Socio-ecological thinking pushes aside idealistic notions over the environment and people; instead, it acknowledges the cultural and societal factors that detract from the adoption of stewardship practices by the public (Frank et al., 2017; Warren, 2018). Socio-ecological thinking for urban spaces has long been deemed necessary in both science and practice (Frank et al., 2017). Extension has recognized its need (Warren, 2018) but may benefit from more meaningfully adopting models that implement an understanding of community-specific context in Urban Extension program development. The framework for Cultural Ecosystem Services (CES) planning (Tandarić et al., 2020) can aid Extension professionals in developing culturally competent programming with urban environmental stewardship goals.

OVERVIEW

CES allow individuals to benefit from their direct engagement with natural spaces through activities like recreation and physical exercise, creative expression, and environmental stewardship (Tandarić et al., 2020). These activities evoke a range of emotions and sensations, including a sense of belonging, connection to a place, a feeling of rootedness, spirituality, self-reflection, tranquility, inspiration, discovery, and the acquisition of knowledge—all while promoting physical and mental wellbeing (Tandarić et al., 2020). CES as a socio-ecological concept is widely used in urban-related environmental fields like urban ecology, urban agriculture and landscape architecture.

While outdoor experiences in urban spaces can be limited (Cox et al., 2017), the emotions stirred by CES-inspired outreach initiatives meant to bring nature to people (e.g., green infrastructure demonstration projects, indoor urban agriculture, and "nature as art" programs) can effectively enhance nature connections without physically visiting a park or forest preserve. CES is also a great starting point for cultivating an appreciation for the myriad of benefits offered by nature (Andersson et al., 2015; Daniel et al., 2012; Schneider & Popovici, 2019). CES is only one of the four recognized categories of ecosystem services, which also include provisioning, regulating, and supporting benefits. These other three categories refer to the raw products obtained from nature, the ability of nature to self-regulate, and the enhancement of ecological functions that generate these natural goods, respectively (Millenium Ecosystem Assessment, 2001). The experiential and cultural aspects of CES make them more relatable and significant to individuals compared to other, more abstract types of benefits such as provisioning, regulating, and supporting ecosystem services (Tandarić et al., 2020).

The qualities characterizing CES are shaped by five key factors, often referred to as the 5Ps, that collectively provide a comprehensive framework for understanding and implementing CES-inspired programs, ensuring that they are culturally relevant, effective, and responsive to the unique characteristics of the communities and places they serve. The 5Ps are:

- Place: Place is the specific location or setting where CES activities occur. Place considers the physical environment and its characteristics, such as parks, urban green spaces, or community gardens.

- Past: Past takes into account the historical and cultural aspects of the community or place. Understanding historical contexts, including local traditions and practices, is essential for effective CES.

- People: People are the individuals and communities involved in or impacted by CES. Defining the individuals and communities involved entails considering the demographics, cultural diversity, needs, and interests of program participants.

- Practices: Practices encompass the activities, methods, and strategies used in CES initiatives, defining the practical aspects of how engagement with nature and science is conducted.

- Purpose: Purpose addresses the objectives and goals of the CES program. This factor clarifies why the program exists and what it aims to achieve in terms of community engagement, education, and environmental outcomes.

The 5P framework (Figure 1), extends beyond the boundaries of a particular park or vegetated location; the environment surrounding a park can significantly shape how visitors perceive it (Tandarić et al., 2020). Furthermore, individuals might experience CES-like benefits within their homes as they reminisce about moments spent in the park (Tandarić et al., 2020). When applying the 5P framework to a broader urban landscape rather than a particular park or green space, it offers essential context for developing nature experiences that are culturally relevant, practical, and supportive of an appreciation for the benefits of nature that extends beyond those directly associated with CES (Andersson et al., 2015; Daniel et al., 2012; Grabowski et al., 2019; Schneider & Popovici, 2019; Tandarić et al., 2020).

IMPLEMENTATION

Using the 5P framework as a program development tool for Extension is simple: fill in the blanks for each of the respective factors during program development. Each section should be completed with regard for the target audience and the target audience's relationship with the Extension program's theme(s). The model assumes a familiarity with the target audience via direct contact or expert consultation. For example, Table 1 displays an example of the 5P framework when completed for a target audience of Hispanic female immigrants in a Northeastern city; the completed model proposes program ideas based on several CES foci. The framework was completed generally—using context from the city's history and current dynamics—and could be helpful for various ecosystem service-themed events. Although all proposed activities take inspiration from a CES, CES are sometimes used as opportunities to induce appreciation of other (non-CES) benefits of nature. Each CES-inspired activity is expected to lead to appreciation of nature's benefits, sometimes beyond the benefits of the service itself.

Figure 1. The 5P framework. From Tandarić et al. (2020).

REMOVING BARRIERS FOR MARGINALIZED POPULATIONS IN THE PROGRAM PLANNING CYCLE

Urban populations are continuously diversifying, and the identities of these diverse demographics can cause them to experience barriers that detract from participation in Extension. Extension personnel can use the following checklist (Figure 2) as a supplement to the 5P framework (Figure 1) or on its own when the target audience of an Extension program is a marginalized population. The checklist is inspired by the Community Development Block Grant Disaster Recovery's Citizen Participation and Equitable Engagement Toolkit (United States Department of Housing and Urban Development, 2023) and by The Community Toolbox of the Center for Community Health and Development (2023).

CONCLUSIONS

Beyond increasing environmental or agricultural literacy among urban residents, the goal for Extension professionals is to feel empowered to provide culturally relevant programming. By taking into consideration the real-life experiences of their participants, Extension professionals can empower their audiences. This approach can help deliver culturally competent content to marginalized individuals and families. Utilizing the 5P framework as a program development tool ensures Extension programs account for place, past, people, practices, and purpose when formulating activities that strive to promote a sense of efficacy or appreciation towards natural resources and agriculture. The purposeful implementation of the 5P framework and the supplemental checklist allows Extension educators to apply a unique, personalized recipe to their work with marginalized segments of the population and encourages the development of programs that are accessible to the target audience.

Table 1. An Example Application of the 5P Framework

5P Framework	Target Audience	Theme (Ecosystem Service)			
	Hispanic female immigrants in Hartford, CT	*CES benefit: Inspiration*	*Provisioning benefit: Food*	*Regulating benefit: Heat mitigation*	*Supporting benefit: Habitat for pollinators*
Place	☐ Urban area (limited natural space) (Dewitz & U.S. Geological Survey, 2021) ☐ Racial divide—North End mostly Black, South End mostly Hispanic, West end mostly white (Lis, 2013) ☐ Urban decline and disinvestment (Galster, 2019) ☐ Documented disparities between greenery and crime rates in some neighborhoods (Zhang & Park, 2023), can lead to larger negative perceptions of nature	☐ Documented disparities between access to greenery and Hispanic population, but trend disappears when controlled by income (i.e., income is the true predictor, but Hispanic Hartford residents are likely to be low income) (Hanson et al., 2016; Li et al., 2015)	☐ Grocery gap (Zhang & Ghosh, 2016) ☐ COVID-19 and inflation worsening food insecurity (DiSalvo, 2022)	☐ Presence of urban heat island effect (Singer et al., 2016) ☐ Creation of cooling stations in libraries and other public spaces (Elton, 2021)	☐ Poor connectivity to promote habitat for species (Google Maps, n. d.) ☐ Presence of a few pollinator gardens (Bullard, 2021)
Past	☐ Redlining (McGann, 2014) ☐ Discriminatory housing policies (Baker et al., 2022) ☐ White flight (Lis, 2013)	☐ Environmental racism (Valocchi, 2009)	☐ Supermarket redlining (Meehan, 2020) ☐ 85% of chain supermarkets left Hartford between 1968 and 1984; few returned to lessen food insecurity	☐ Historical heat waves recorded to have caused illness (Singer et al., 2016)	☐ Historical trends of landscape degradation (Google Maps, n. d.)
People	☐ 41.86% of population is Hispanic (Data USA, 2020) ☐ 21.1% of population are foreign-born (Data USA, 2020) ☐ High likelihood of multilingual households (Data USA, 2020) ☐ Hispanics follow whites and Blacks in high school degree attainment (Data USA, 2020) ☐ If single-mother household, likely below poverty line (Pearce, 2019)	☐ Hispanic residents of Hartford more likely to live in block groups with less yard (Li et al., 2016)	☐ Hispanic residents of Hartford who are low income have high food insecurity, impacting nutrition of dietary intake (Hong et al., 2006)	☐ Non-white populations and Hispanics are more likely to live in heat-risk areas (Jesdale et al., 2013)	☐ No specific site data, but, nationwide, environmentalism (including the protection of habitat for species) has been a white-centered movement (Bullard, 2021; Valocchi, 2009)

Table 1. (*continued*)

5P Framework	Target Audience	Theme (Ecosystem Service)			
	Hispanic female immigrants in Hartford, CT	*CES benefit: Inspiration*	*Provisioning benefit: Food*	*Regulating benefit: Heat mitigation*	*Supporting benefit: Habitat for pollinators*
Practices	☐ There are many environmental nonprofits and city-led initiatives that host events for community engagement (City of Hartford Forestry Division, 2020), but historically, such initiatives tend to exclude marginalized populations (Grabowski et al., 2019)	☐ No site-specific observations, but similar cities have documented immigrants relying on local parks to reconnect with their home countries (Stodolska et al., 2011)	☐ No site-specific observations, but similar cities have documented importance of cuisine and medicinal practices in nature connection for Hispanics (Nix, 2016; Vandebroek & Balick, 2014)	☐ Racial minorities in Hartford are recommended to use libraries as oasis (Singer et al., 2016) ☐ Hispanic residents of Hartford are interested in diminishing their vulnerability against the impacts of climate change (Singer et al., 2016)	☐ There is record of Bioblitz events (community science events where biological census of local species are held) occurring in low-income neighborhoods of Hartford (Lundmark, 2003) ☐ No site-specific observations relating to residents' relationship to pollinators, but studies have documented use of honey (pollinator produced) for self-care and/or medicinal use by Hispanics (Neafsey et al. 2007)
Purpose	☐ To raise awareness of the multifunctional role of natural spaces in the city	☐ To promote appreciation of nature's beauty	☐ To promote health through nutrition	☐ To raise awareness of heat illness, existing resources, and the role that urban nature plays in mitigating heat waves	☐ To promote participation in local initiatives to protect pollinators

Table 1. (*continued*)

5P Framework	Target Audience	Theme (Ecosystem Service)			
	Hispanic female immigrants in Hartford, CT	*CES benefit: Inspiration*	*Provisioning benefit: Food*	*Regulating benefit: Heat mitigation*	*Supporting benefit: Habitat for pollinators*
Program conceptualization and must haves	☐ Provide childcare or combined caregiver-child programming ☐ Provide programming in preferred language, bilingual, or via translators ☐ Create a safe space for stress relief ☐ Provide flexibility in participation through time and date ☐ Provide flexibility in participation through indoor/outdoor events (and have a virtual attendance option for indoors)	☐ Description: "Nature as Art" event: participants find inspiration from nature to create art pieces ☐ If outdoors: Could use surroundings for inspiration ☐ If indoors: Could ask participants to bring a picture of a natural landscape from their hometown that inspires them ☐ Guided discussion: While participants are creating art, hold a group discussion about the cultural value of different natural landscapes, difference in access to natural areas since immigrating, tree equity in their neighborhoods, etc.	☐ Description: Urban agriculture for food access ☐ Outdoors: At a community garden, space for an outdoor picnic to bring in culturally relevant vegetables and recipes ☐ Indoors: A class where students learn how to make small-scale indoor home gardening systems; incorporate culturally relevant herbs, recipes and medicinal remedies can ☐ Guided discussion: Discussion about cultural relationships to food, local food access, changes in nutrition since immigrating, gardening as a physical exercise, health benefits of gardening, etc.	☐ Description: Urban heat island lesson ☐ Outdoors: A group walking tour of a park; participants are asked to determine where it feels warmer (under tree shade or on pavement) ☐ Indoors: Technology like virtual reality simulations, 3D maps, etc. to depict heat in relation to amount of natural space in cities and what this relationship is in their own neighborhoods ☐ Guided discussion: Discussion to share existing resources (like the location of cooling stations and accessible healthcare) and provide tools that support heat relief, focusing on supporting immigrant outdoor workers, elderly, children, etc.	☐ Description: Creating habitat for species activities ☐ Outdoors: A walking tour of existing pollinator gardens and/or green corridors where participants identify species in the outdoors and report them using a tool like iNaturalist (iNaturalist, n. d.) ☐ Indoors: An activity where participant make products out of honey and bee wax (face masks, teas, etc.) while learning about pollinators ☐ Discussion: Discussion of the importance of biodiversity, how participants relate to or value it, whether this has changed since immigrating, ways in which they contributed to a healthy environment in their home countries, and local initiatives they could engage in to protect habitat for urban biodiversity (like pollinators

A checklist for eliminating barriers marginalized populations may face when engaging in Extension

☐ Are the recruitment strategies appropriate for the target audience?

☐ Are appropriate community-based organizations involved as partners?

☐ Are community leaders co-facilitators or co-organizers?

☐ Is program schedule mindful of important community events?

☐ Are the recruitment strategies effective at reaching the target audience?

☐ Is program registration accommodating to the target audience?

☐ Are there at least two methods for registration (i.e., phone, online, in-person, etc.)?

☐ If the target audience largely includes caregivers, is childcare or combined caregiver-child programming offered?

☐ If offered, is childcare and/or child programming accommodating of different abilities and needs?

☐ Are appropriate meals provided for the time and duration of the program?

☐ If the target audience will likely miss work (whether formal or informal employment) to attend and are not being compensated otherwise, are monetary incentives provided?

☐ If the program will also serve to extract specialized knowledge from the target audience, will they receive a monetary compensation for their contribution?

☐ If the target audience primarily speaks a different language, will the program be offered in their preferred language?

☐ If the program cannot be offered in the primary language of the target audience, will translators be present?

☐ If the target audience has unreliable transportation, will any of the following be offered: transportation accommodation, mileage reimbursement, or a central program location?

☐ Are accessibility accommodations being provided for those with a physical disability?

☐ Are accessibility accommodations being provided for those who are hard of hearing?

☐ Are accessibility accommodations being provided for those with a visual impairment?

☐ Are accessibility accommodations being provided for those with social anxiety, depression, PTSD, or another mental health condition?

Figure 2. Checklist for eliminating marginalized populations' barriers to Extension engagement.

☐ Will the program be held at various dates and times to provide attendance flexibility?

☐ Will the program have the possibility of hybrid participation (i.e., in-person and virtual) to provide attendance flexibility?

☐ Will there be sufficient staff for the number of participants?

☐ Will restrooms be available within the facilities?

☐ Will gender-neutral restrooms be available within the facilities?

☐ If the target audience includes vulnerable population whose identities needs to be especially protected (undocumented immigrants, victims of human trafficking or domestic violence, victims of potential hate crimes, etc.), are appropriate measures being taken to do so?

☐ Will some type of monitoring and intervention take place to identify and prevent or stop harmful behavior (including language and actions) by program participants?

☐ Will some type of monitoring and intervention take place to identify and prevent or stop harmful behavior (including language and actions) by speakers and staff?

☐ If the target audience include individuals who currently engage or have engaged in high-risk behavior (e.g., excessive drinking, drugs, etc.), has the program been evaluated for potential language, activities, etc. that might instigate the behavior?

☐ Has a risk and needs assessment been performed on the target audience to determine whether any risks are being overlooked?

☐ Is there a clear understanding of the intersecting identities of the target audience?

☐ Is there a clear understanding of how the intersecting identities of the target audience may impose further barriers to participation and engagement?

☐ Are actions (including but not limited to meaningful partnerships) being taken to address other barriers that the target audience may face but are beyond the means of the program organizers to address?

☐ Are the dissemination of program outcomes agreeable to the target audience?

Figure 2. (*continued*)

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