Chapter 15
Urban Greening as a Social Movement

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Abstract The premise of this chapter is that human engagement of city dwellers in acts of urban greening, or environmental stewardship, collectively constitutes a social movement for greater access to the natural environment. The power of urban greening as a social movement is particularly salient for disadvantaged communities in promoting greater resilience, health, and well-being. Grounded in the geographies of urban greening associated with Buffalo and New York City, we consider how some civic environmental stewardship programs positively impact youth. More specifically, we contend that such programs provide vulnerable populations such as adolescents with opportunities for social interaction that include intergenerational bridges and mentoring relationships that confer the psychological resilience needed to sustain such local activism. We develop a systems perspective illustrating how participants in successful civic environmental stewardship programs develop an enhanced sense of control and belonging to a community. The connections that

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individual residents feel to their surrounding community manifest in a heightened concern for others and increased activism promoting public access to green space.

Keywords Local environmental stewardship • Urban green space • Youth engagement • Community health • Systems science

15.1 Introduction

Why don't we see more green space in urban areas? Why doesn't public support arise naturally for local government to prioritize greater access to green space? Given its widely accepted benefits, green space is arguably a public good that is undersupplied. In other words, we cannot expect political coalitions to emerge spontaneously to pressure for local government to change status quo policies on land use, and thus activism for urban greening is not only necessary but crucial.

This chapter focuses on the role of community greening initiatives in fostering social movements comprised of activism for access to green space. We illustrate facets of urban greening in different ways: using geographic maps of Buffalo, NY and New York City, developing a causal map of youth engagement in greening from a systems perspective, and proposing a research design for further inquiry. We contrast urban greening efforts in different geographic contexts to identify relationships between factors of youth engagement with environmental stewardship programs. Through the use of a causal map illustrating complex feedback mechanisms, this study develops a systems perspective to explore the urban geographies associated with environmental stewardship programs that engage youth. Using a systems science approach, we articulate salient pathways for youth engaged in local environmental stewardship programs. These pathways produce complex feedback effects that amplify engagement with urban greening programs. When sustained through civic environmental stewardship, green space affords communities with opportunities for their residents to express, support, heal, and inspire one another (Svendsen et al. 2014).

A core experience of those involved in the social movements underlying civic environmental stewardship is that of the expansion of their individual perspective to become part of a shared point of view. Once activated, the interpersonal relationships arising from successful stewardship programs aggregate across scales to characterize facets of urban greening as a larger social movement. Here we wonder whether the versatility of this sort of social movement lies in the agility of its opinion leaders, acting at the nodes of the larger greening network, to effectively leverage the more fragile relationships that connect local actors strewn across a wide range of urban environmental stewardship organizations (e.g., community gardens) and other human catalysts of urban greening (e.g., the Massachusetts Avenue Project[1] in Buffalo).

[1] The website for the Massachusetts Avenue Project (MAP) is: http://www.mass-ave.org. This nonprofit organization engages youth in urban greening and has been studied as part of Buffalo's local food movement (Metcalf and Widener 2011; Metcalf 2012).

Green space is important and beneficial for exposing community members to the natural environment (Marcus and Sachs 2014). Time spent outdoors provides opportunities to explore the many intersections of grey and green infrastructure and to become aware of the local histories that are embedded into the ordinary geographies of everyday experience (Stilgoe 1998). In this chapter we examine the particular benefits of youth participation in community greening initiatives for health and well-being. Indeed, the concept of health is a confluence of physical, mental, social, and spiritual well-being. Factors at multiple scales contribute to both individual health outcomes and societal inequalities (Northridge et al. 2003).

Western society tends to emphasize the utilitarian value of parks and other kinds of green space, assessing their value in terms of ecosystem services, recreational use, or real estate value. Community gardens, for example, may be seen as having an agricultural or aesthetic value. Yet, some local governments may also take into account the opportunity cost of using the community garden land as residential or commercial space, which is realized as lost tax revenue and potential jobs. This utilitarian perspective helps to account for the rise of urban farms in "hollowed out" parts of old industrial cities such as Buffalo where the tax base has been shrinking, so the opportunity cost is low for the local government.

Green space can be the site of shared understanding, but the ownership of such space may be contentious. It is contentious both instrumentally and spiritually. Instrumentally, responsibility for green space is shared and hence when the sense of community is lacking, neglect often follows. Spiritually, parks as public spaces often host gatherings for political reform and social protest, as illustrated in recent years by the Occupy Wall Street Movement and the conflict over Gezi Parke in Istanbul.

When aligned with purposeful human activity, a public place can be transformed from ordinary to sacred (Northridge and Mark 2013). The land's value then goes beyond the utilitarian, since the the rating of its use brings psychological benefits that cannot be easily replaced. Research has explored the spatial contours of significance that arise from one's proximity to, and the nature of, human loss, as in living memorials created in remembrance of the tragic events of September 11, 2001 (Tidball et al. 2010; Svendsen et al. 2014).

Local environmental stewardship signifies a special kind of care in the accumulated acts of giving back that serve to interconnect humans with our grey (i.e., built environment) and green (i.e., natural environment) urban infrastructures. Human beings thus function as "inter-actors" embedded in a social, ecological urban system. The cultivation of green space compels human attention and care, invites access, and encourages social interaction. This interconnectedness catalyzes dynamics that fuel activism for access to green space.

Green space promotes many positive health outcomes through exposure to nature as well as opportunities for social connection. The restorative and therapeutic capacity of green space has been well documented (Marcus and Sachs 2014). In particular, the mental health benefits of green space have been recognized and found to vary with the life course (Astell-Burt and Feng 2015; Astell-Burt et al. 2014). As explored in this study, human experiences with stewardship of the natural environment serve to instill a sense of belonging to one's community.

Resilience requires anticipating change in the habitability of places, such as coastal zones. It means being able to adapt, learning to leave a living legacy for humankind. Civic environmental stewardship, in this sense, is a salvation strategy. Recognizing nature as an integral part of social systems, we locate the potential for resilience in social relationships as well as in the physical design and form of urban environments (Svendsen et al. 2014).

This chapter is oriented toward the personal relationships activating social movements promoting greener urban geographies and ways that people can positively impact the production of ecosystem services. In the least green places there are sometimes higher levels of stewardship than expected (Tidball and Krasny 2014). This tendency suggests a potential feedback mechanism by which a dearth of community resources produces a counteracting impulse to heal and help one another. If greening happens more where it is most needed, as in red zones (Tidball and Krasny 2014), then the need (the gap) would incrementally decrease as greening efforts become more prevalent, iteratively closing the gap. Consistent with this logic, we use systems science to explore ripple effects and identify leverage points for urban greening activities such as community gardening (Svendsen et al. 2012).

15.2 Geographic Contexts

When developing a more comprehensive theoretical model, it is often useful to first explore a few cases that are reliable microcosms of the system being studied but which differ in their geographic context. Given our focus on urban greening, we compare two geographic contexts that highlight structure differences among urban areas more generally. Specifically, we consider how urban greening constitutes a social movement in the geographic contexts of Buffalo and New York City in the state of New York. While Buffalo and New York are the two largest cities in the state of New York, they offer a stark contrast in scale as they straddle the urban hierarchy, with New York City's population of 8.4 million residents dwarfing the city of Buffalo's population of approximately 260,000 residents. Despite their marked differences in population size and density, both cities have experienced urban greening as an emergent social movement. Here we discuss some particulars of these geographies of urban greening. These cases provide a foundation for the systems perspective of youth engagement in greening programs that we develop using a causal map in the subsequent section.

15.2.1 Community Gardens in Buffalo

Green space confers diverse utilities, evidenced by the symbols of abundance such as flowers and fruit that are associated with green space. Although social meanings evolve over time, a common thread associated with gardens and other kinds of green

space is that of care, or concern, for one another (Knigge 2009). Community gardens offer tangible nutritional benefits to residents in the form of fresh fruits and vegetables, but also confer intangible benefits like the aesthetic appreciation and sense of sacredness that many feel in the presence of nature (Svendsen 2011; Svendsen et al. 2012). This chapter builds upon earlier systems explorations of the social movements promoting local food and urban agriculture in Buffalo, NY (Metcalf and Widener 2011; Metcalf 2012). This iterative examination aligns with the approach taken by Knigge and Cope (2009) to study green space.

Here, our consideration of the utility afforded by green space begins with a 2004 inventory of community gardens in Buffalo, NY that was mapped as part of a study that employed iterative qualitative GIScience for grounded visualization of urban greening initiatives (Knigge 2009; Knigge and Cope 2009). The map in Fig. 15.1 illustrates the locations of community gardens in Buffalo, NY as characterized by purpose: ornamental, food, or both. While many of the gardens mapped in Fig. 15.1 have an ornamental purpose, some also provide food. This visualization highlights the different types of gardens that may be cultivated for and by the community. The varied types of use and lack of a clear geographic pattern in that use reflects the community impetus and local context that shapes use decisions.

As the presence of community gardens and green space is depicted in Fig. 15.1 alongside median income according to the 2000 U.S. Census, we observe a relative dearth of both in the poorest areas. This points to the importance of leveraging urban greening as a social movement to better serve disadvantaged communities. Additionally, the similar lack of community gardens in the most affluent areas suggests that urban greening arises more naturally as a social movement in middle-class communities.

15.2.2 Environmental Stewardship in New York City

Shifting scale to New York City enables us to consider different kinds of insight about urban greening activities. In this section we draw upon the rich data collected by the Stewardship Monitoring and Assessment Project (STEW-MAP) for New York City.[2] Through organizational surveys and interviews, STEW-MAP explores the interactions among people and groups that conserve, manage, monitor, advocate for, and educate the public about their local environments. STEW-MAP includes voices from citizen groups in New York City such as informal block associations and tree planting groups as well as formal nonprofit organizations. Studies leveraging NYC STEW-MAP observations highlight the importance of stewardship as a form of governance and the growing professionalization of these civic groups (Svendsen and Campbell 2008; Connolly et al. 2014). STEW-MAP research also reveals how stewardship storylines influence design and practice (Svendsen 2013). These STEW-MAP studies characterize the structure and function of urban environmental

[2] The STEW-MAP NYC homepage: http://www.stewmap.net/stew-map-cities/new-york-city/

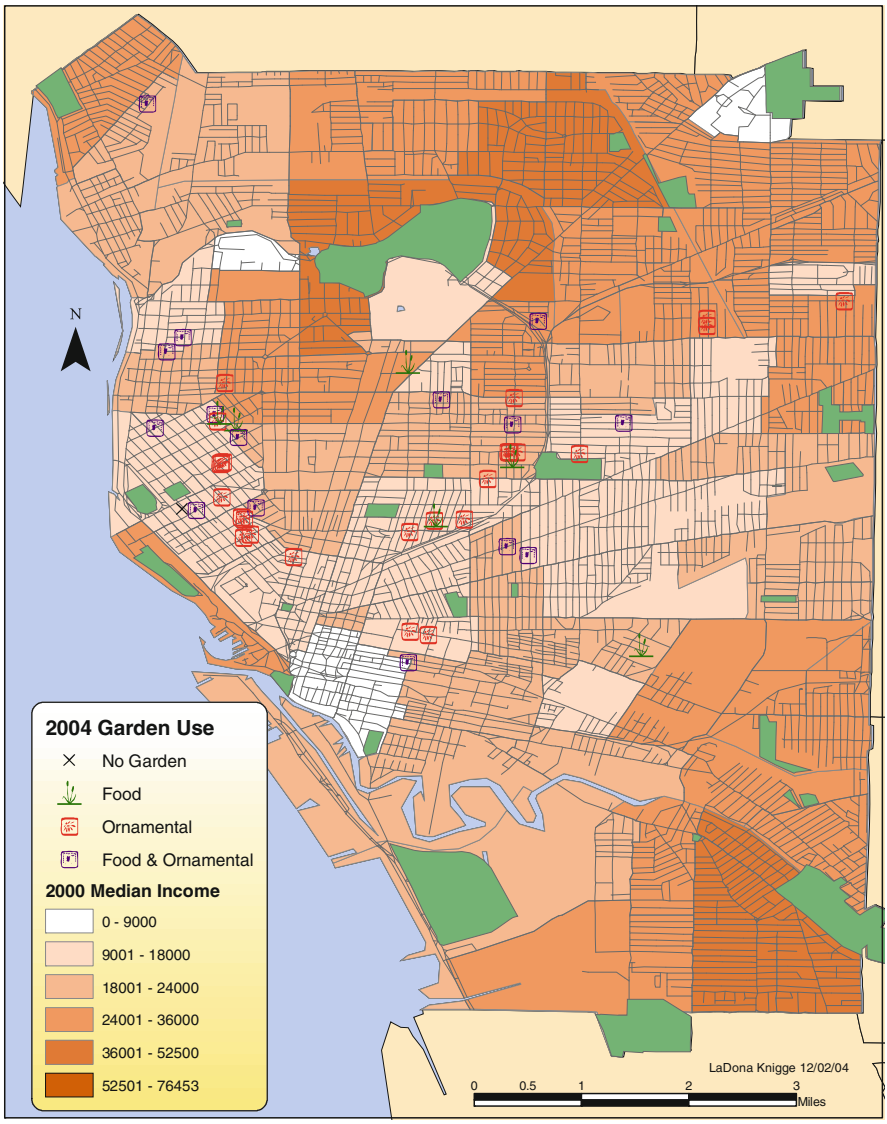

Fig. 15.1 Community gardens in Buffalo, NY

stewardship and the organization of stewardship networks in the city (Svendsen and Campbell 2008). Network analysis identifies the connections between civic environmental groups and key stewardship nodes that work with many different partners (Connolly et al. 2013, 2014). Through its rigor and relational emphasis, the STEWMAP project effectively adds a social layer of information about green urban geographies in New York City.

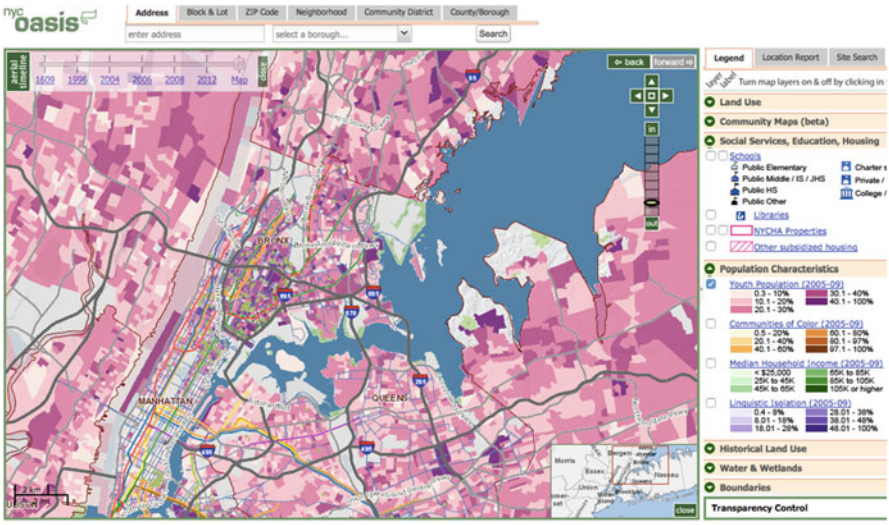

Fig. 15.2 Interactive GIS featuring layers for youth population density and green space

An accessible and iterative investigation of stewardship in New York City is enabled by STEW-MAP's online GIS database, which displays geographic data associated with many of these stewardship groups alongside other data layers. Figure 15.2 is an example of the custom maps that can be constructed using the online GIS provided via the STEW-MAP project, linking information about stewardship areas and organizations with other geospatial data.[3] The map in Fig. 15.2 includes a layer for the prevalence of youth in the population of each census tract so as to facilitate exploration of where opportunities exist for urban youth to be exposed to green space and to engage in acts of civic environmental stewardship. The many health benefits of green space for youth are described by Louv (2008). These benefits warrant the development of more stewardship programs in underserved communities that connect youth to their local environments so as to promote health equity.

In addition to the demographic layers that can be illustrated, as in Fig. 15.2, the STEW-MAP project also enables mapping of stewardship "turf," or areas of operation for civic environmental stewardship organizations. The turf maps are based upon answers to a question in which survey respondents were asked to describe in detail the boundaries of where their group works. For example, Fig. 15.3 contrasts turf for stewardship programs that primarily focus on education (at left) and youth (at right).[4]

[3] Figure 15.2 was created using the publicly available online database from STEW-MAP NYC: http://www.urbanresearchmaps.org/oasis/map.aspx

[4] The maps in Fig. 15.3 were created using the publicly available online database from STEW-MAP NYC: http://www.oasisnyc.net/stewardship/stewardshipsearch.aspx

Fig. 15.3 Turf maps for civic environmental stewardship organizations in New York, NY that mention education (*L*) and youth (*R*) as primary focus areas

The maps in Fig. 15.3 illustrate some areas of overlap in the spatial distribution of the turf associated with stewardship programs that indicate education and youth as primary areas of focus. Online maps like these may be used by the public to examine the spatial influence of organizations that engage with youth in their greening initiatives. For instance, while it is natural to expect high clustering of the activities of education and youth organizations given their similar focus, Fig. 15.3 identifies significant areas of turf that are geographically distinct. This pattern is consistent with theories of social movements in that these organizations often seek to establish reliable bases of support within the community by leveraging existing social institutions and other connections to local social networks. These maps demonstrate the benefit from shifting perspectives by which one could take an iterative triangulation approach to contrasting landscapes of urban greening.

15.3 Human Experiences with Urban Green Space

Human beings are increasingly facing the consequences of global climate change in terms of extreme events experienced as sudden environmental shocks to the system. Our society continues to experience more uncertainty. We have undergone a shift in awareness of our societal vulnerabilities and are learning how to work more effectively with our grey, green, and human resources. To address the sustainability challenges of our time, we must understand the implications of a growing diversity of populations needing access to green space. For example, although there have been growing investments in New York City's green space, many of these are motivated by preservation of capital property, so that there are stark inequities in the conditions of parks across the city. Here we may ask: Why aren't we realizing the environmental and community health outcomes we want? What would the city look like if we managed green space to produce different outcomes?

Observational studies of green space usage reveal diverse park users who vary by time of day. In making such observations, we might wonder: What is expressed when a person is observed to be sitting on a city park bench? An older person may be communing with a younger self, reconnecting with memories of earlier stewardship activities. Honoring, being, reflecting: these subtle sacred practices lack a recognizable language. How do we adequately account for the value of simply relaxing and enjoying being at the park?

What do we know about sacred space? Speaking of the sacred transforms our conception of well-being into something we haven't been able to easily talk about. How is the sacred expressed? There is a layered, hidden, everyday meaning expressed by human activity in green space. Acknowledging the sacred goes beyond the utilitarian view to say that spiritual human needs are also fulfilled by the park and the garden. These experiences feed back to nourish a stronger self. This view positions people themselves as part of the ecosystem services they produce.

15.4 Modeling Systems of Boxes, Bodies, and Botany

Whether we visualize our cities as grey, green, or tinted with other hues, we sometimes share, via our unseen interconnections, a sacred feeling. Using the tools of systems science, we might trace a sacred spiral as an ongoing cycle involving ripple effects from the transformation of ordinary to sacred in human perceptions of place. A person might trigger a reinforcing feedback loop promoting a clearer conscience and sharper perception of oneself in one's surroundings over time, facilitating the adoption of more sustainable behavior. This conception encompasses diverse but interdependent elements of the urban setting, from intangibles such as human relationships and mental models to tangible gardens, groves, graves, roads, rivers, skyscrapers, vehicles, and the like. With the aid of systems modeling, we might simulate our cities using discrete objects for boxes (e.g., "grey" buildings and the like), bodies (e.g., human beings and other animals), and botany (e.g., "green" plants in gardens, parks, and other urban spaces).

System dynamics is an established methodology for modeling complex systems involving specification and simulation of feedback mechanisms comprised of causal linkages and time delays (Sterman 2000). In this modeling tradition, boxes are used to represent continuously changing stocks, or accumulations, of quantities that characterize the state of the system. A environmental stock relevant to urban greening would be the local biodiversity of the urban ecosystem as influenced by the flow of stewardship activity. Intangible stocks include human memory, considered at both the collective and the individual scale. Human experience, as in exposure to green space or to pollution, also constitutes a stock that accumulates over time. Social capital could also comprise a stock of accumulated interpersonal interactions.

In contrast to stocks, flows indicate rates of change over time that add to or deplete the stocks to which they are connected. Green space, for example, may be conceptualized as a stock, while cultivation (greening) is a flow into the stock. As depicted in Fig. 15.4, this stock of green space may be diminished by urban devel-

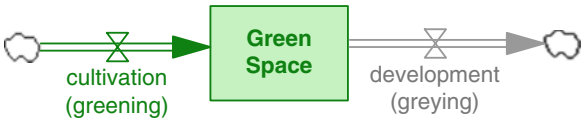

Fig. 15.4 Green space conceptualized as a stock changing via flows

opment (greying). This representation is a simplified view that does not account for the multiple ways in which grey and green infrastructures may be integrated (as explored in Svendsen 2011).

Human activity is incurred over time as a flow of energy invested in our urban infrastructures. If human resources are considered as a kind of distributed energy, it follows that a social movement carries a flow of energy distributed among our human resources. Thinking about flows as rates of change helps to differentiate between rapid/acute (shock) or slow/chronic (abandonment) system disturbances. In coastal regions, for instance, we would be interested in the effects of rapid shocks such as storm surges as well as more chronic disturbances such as sea level rise.

15.5 A Systems Perspective on Youth Engaged in Greening

An important component of this systems science approach is to make visible the unseen. In drawing out these invisible relationships, we use the language of systems thinking to express qualitative insights. As an integral part of public engagement with local environmental stewardship, we emphasize here the significance of youth who engage in greening activities. Adolescence is a particularly vulnerable stage in the life course (Steinberg 2014). Effective interventions with adolescents therefore have the potential to change the long-term life trajectories of youth participants. The systems perspective developed in this section connects outer activism with the inner psychological resilience of youth via multiple pathways.

Figure 15.5 illustrates such a causal map of youth engagement in greening initiatives.

This causal map visually expresses a dynamic hypothesis as a set of theoretical expectations about relationships among factors that motivate youth engagement with community greening initiatives. While the map is an integrated whole, it is "built" from deeper, theoretical reflection (informed by extant research) about the causal process and the nature of feedback mechanisms involving local social networks, institutions, and organizations.

Development of a causal map such as that depicted in Fig. 15.5 is consistent with the practice of system dynamics and follows the principles of systems thinking (Meadows 2009). A feedback loop is reinforcing if it has an even number of negative links, and balancing if it has an odd number of negative links. For the causal map in Fig. 15.5, all links are positive, so all feedback loops have zero (0) negative links. Because zero is an even number, all loops are reinforcing. Therefore, although positive and negative causal links are often depicted with positive (+) and negative (−)

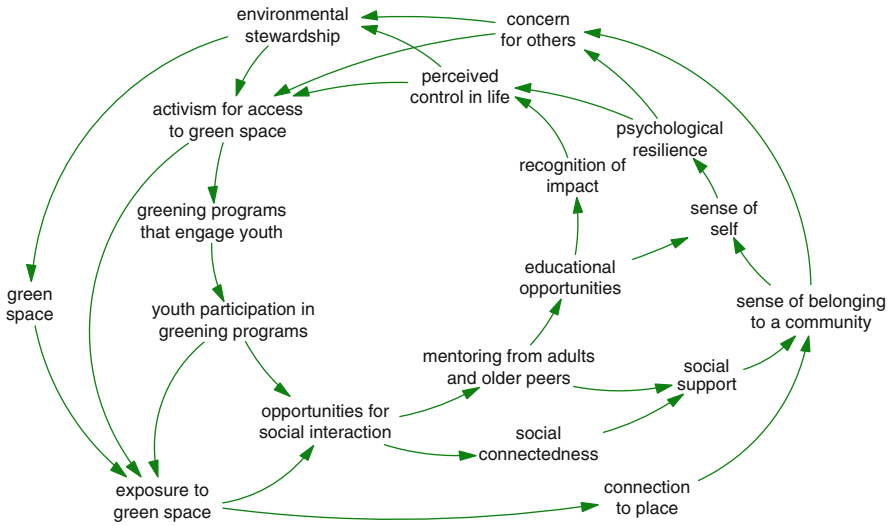

Fig. 15.5 Reinforcing psychological resilience in youth through environmental stewardship

polarity signs on the arrows, for simplicity no polarity signs are shown in Fig. 15.5 since all links are positive.

The causal relationships drawn in Fig. 15.5 produce a set of reinforcing feedback loops. In describing these mechanisms for the case of youth engagement in greening, we trace our logic in terms of increasing growth, but note that the reinforcing tendency also applies to decreases in the corresponding elements. In other words, the reinforcing feedback effect amplifies the change in the same direction, whether increasing or decreasing. Reinforcing feedback loops produce opposite behavior from that of balancing feedback mechanisms in which changes to the system in one direction are counteracted by their effects in the opposite direction. In other words, the reinforcing loops cause effects to be multiplicative in nature where change in one part of the system is strengthened by triggering subsequent change elsewhere in the system.

Beginning at the top of Fig. 15.5 with *environmental stewardship* and tracing the outermost loop counterclockwise, we follow the logic that an increased abundance of *green space* leads to more human *exposure to green space*, thereby enhancing one's *connection to place* and bringing about a *sense of belonging to a community*. Such a sense of belonging links the individual to their community, increasing *concern for others*, which in turn increases likelihood of more *environmental stewardship* and also *activism for access to green space*.

From this effect and the connection between *environmental stewardship* and *activism for access to green space*, another set of reinforcing loops is then activated. Following the innermost loop, with an increase in public *activism for access to green space*, we expect to see more urban greening programs, and specifically *greening programs that engage youth*. A greater abundance of urban greening programs leads

to more *youth participation in greening programs*. In addition to the environmental benefits of civic stewardship, then, we see that youth participation leads to increased *opportunities for social interaction*. Indeed, effective environmental stewardship programs have learned that these opportunities include *mentoring from adults and older peers*. Over time, such mentoring improves *educational opportunities* for disadvantaged youth. Consistent with the differences in "turf" illustrated in Fig. 15.3, we expect youth- and education-focused greening programs to serve overlapping but distinct populations due to the effects in this reinforcing loop.

The broadened horizons of participants in these educational programs help to bring about the *recognition of impact* that one's environmental stewardship activities can have on overall community health and well-being. Such a personal recognition would enhance one's *perceived control in life* and thereby feed back to increased *activism for access to green space*. Tracing this feedback loop highlights how we believe activism for access to green space will have ripple effects in a reinforcing manner that eventually lead to more activism.

Additional feedback effects are created as elements of the innermost loop connect with those of the outermost loop. For example, a cascading effect from increased activism and youth participation (along with the extent of green space itself, as noted above) is increased *exposure to green space*. Another loop may be traced counterclockwise from increased *youth participation in greening program* to a strengthened *connection to place*.

Following again from increased youth participation in greening programs, for the third loop we look to the *opportunities for social interaction* that occur in the context of a community greening initiative. All else being equal, this increased opportunity leads to greater *social connectedness*, *peer acceptance*, and *sense of belonging*. These social opportunities can also lead to *mentoring from adults and older peers*, which in turn benefits *social support* as well as *educational opportunities* (as noted above). *Social support* leads to a greater sense of belonging to a community. This sense of belonging, along with expanded *educational opportunities* from effective mentoring ultimately enhances one's *sense of self*.

A critical effect from *sense of self*, then, is to strengthen *psychological resilience*, which feeds back to both *perceived control in life* and *concern for others*, completing multiple reinforcing feedback loops. Through these feedback loops, *sense of self* plays a central role in improving the mental health of participants in urban greening programs.

Figure 15.5 positions *psychological resilience* as a key component of systemic health and well-being. Specific mental health outcomes challenging psychological resilience include depression and anxiety. Numerous other positive effects of green space on health and well-being are known to exist, such as health benefits from physical activity associated with stewardship and recreation, or nutrition benefits from improvements to healthy food access through community gardens. These alternate pathways can be thought of as additional reinforcing links between *exposure to green space* and *psychological resilience*.

In short, the causal map specifies how urban greening produces health benefits such as psychological resilience and social well-being. Urban greening programs

also impact the educational and life goals of young people. Stewardship networks form generational bridges such as adults and older peers mentoring vulnerable youth.

In the following section we outline a multi-method research design that builds upon the conceptual framework presented above to further study success factors of youth engagement in stewardship programs.

15.6 Looking Ahead: A Design for Research on Greening and Well-Being

Our exposition of these geographic and causal maps provides a foundation for future research focused on modeling youth engagement with greening programs in disadvantaged communities. The important work of urban greening needs a health equity lens. While the link between greening and health has been well studied (see, e.g., Astell-Burt et al. 2014), this line of research is unique and significant in terms of its emphasis on promoting health equity and opportunities for young people who live in disadvantaged communities. We must ensure that groups who would most benefit from salutogenic design are actually part of the decision-making process.

The complexity of achieving public health equity is particularly salient in communities with a diverse identities, needs, and aspirations. Greening is high leverage in promoting health not just because of increased exposure to urban nature but also because of the experience of engaging with a distinctive social movement. Following from the causal map depicted in Fig. 15.5, this study aims to conduct additional research to understand youth-oriented environmental stewardship programs that are successful. Specifically, we seek to characterize what the causal mechanisms are in an understudied population of adolescents who don't have a lot of resources.

A benefit of qualitative research, and of systems science, is that insights emerge in the course of conducting the research. For this reason, community-based system dynamics modeling involves iteration and inclusion of needed voices (Hovmand 2014). Yet we may ask: How do we integrate rich qualitative information into urban ecosystem management regimes? Despite its recognized importance for understanding urban greening, qualitative research is often difficult for natural resource managers of urban ecosystems to act upon. Nevertheless, qualitative data such as stories, interviews, social relations, and photographs are invaluable for the characterization of site-specific geographies of urban green space. These observations are complementary to quantitative measures and help to inform causal pathways and directions of system change.

This research will integrate participatory methods of systems science with a positive deviance approach to community health. Positive deviance is an asset-based approach to health behavior and social change, centered on collective discoveries of often microscale, invisible, yet highly effective solutions that already exist within the community without extra resources (Zeitlin 1991; Sternin and Choo 2000; Singhal et al. 2010). This research will explore behaviors of stewardship organizations that exhibit positive deviance.

This inquiry into the effectiveness of urban greening programs that engage with youth in disadvantaged communities will leverage the STEW-MAP social ecosystem database of stewardship organizations in New York City introduced earlier. Our first step will be to follow up with the originally surveyed participants to identify stewardship organizations exhibiting positive deviance that maintain successful community partnerships and engage with youth. From a set of organizations that exhibit positive deviance, participatory workshops will be conducted to discover and visually map out what organizational and individual practices can, against all odds, lead to youth engagement in greening programs. Furthermore, these community-based participatory workshops will explore how youth engaged in greening activities abet their mental health and social connectedness.

Building upon the conceptual framework outlined in Fig. 15.5, these more complete workshops and youth survey data will inform the development of a model of youth engagement in greening programs. In particular, this research will consider the attitudes, experiences, and mental health outcomes – specifically depression and anxiety – among youth participating in urban greening programs. These outcomes are amenable to support from such initiatives. Mental health has other connections to physical activity, use of coping mechanisms, and formation of social ties, which may also be strengthened (improved) by exposure to greening programs.

This line of research leverages benefits of hybridity, using multiple methods to gain a more expansive view of the system. Specifically, we aim to combine the rigor of positive deviance to select environmental stewardship organizations applying participatory approaches to translate qualitative insights into a model. This research will inform the design of a multiscaled model to illustrate the structure of the system and explore the social and economic dynamics underlying the availability and utilization of urban green space. Both qualitative and quantitative GIS data can inform or be directly integrated into a dynamic model. Our iterative multi-method approach facilitates grounding abstract models with empirical observations and offering the potential to visualize changes in behavior over time.

15.7 Conclusion

The provision of green urban space, particularly in socioeconomically disadvantaged communities, creates opportunities for social behaviors that promote well-being and health equity. For many people green space even reflects a sense of the sacred, an intangible connectedness, a kind of “mad love,” that transcends the ordinary. These places are therefore integral not only to the daily lives of community members, but also to the collective spirit of humanity. Communities seeking to promote resilient green infrastructure would be well-served to nurture the social meaning in these shared places.

This study points to the importance of new research to identify and model effective strategies for engaging youth in greening programs in disadvantaged communities. Such research would examine which environmental stewardship organizations

particularly excel at engaging disadvantaged youth in greening projects without extra resources. In turn, these organizations will provide unique insight into efficient and effective strategies to improve the mental health of urban youth through involvement in greening programs.

In articulating urban greening as a social movement, we envision the cultivation of neighborhood resilience networks in which people are active agents. In this era of technological advancement, social inequality, and environmental crises, we have a responsibility to act with awareness of our human contributions to the global ecosystem. We find evidence of the social dimension of sustainability in the interrelationships that underlie successful environmental stewardship programs and their benefits for health and well-being among all members of the community. This social connectedness is a source of hope for increased activism over time for greater access to green space in urban areas due to the positive mental health benefits.

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