

Civic Ecology Education

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Abstract

Civic Ecology practice encompasses community gardening, urban woodland restoration, wildlife and stream habitat enhancement, and similar community-driven volunteer activities focusing on the environment. Such practices result not only in enhanced “natural capital,” including biodiversity, landscape heterogeneity, and ecosystem services, but also foster social capital, such as when adults working together develop trust, become involved in local policy-making, and form partnerships with non-profit associations. Civic Ecology Education refers to environmental education programs that are integrated into Civic Ecology practices. For example, in the Garden Mosaics educational program, youth worked alongside and learned from community gardeners (civic ecologists). Ecological theories of learning that view learning as a process which transforms both the learner and the socio-ecosystem through a series of positive feedback loops are particularly useful for understanding Civic Ecology Education. Resilience theory is also helpful in developing an understanding of the role Civic Ecology practices and Civic Ecology Education play in fostering the ability of a socio-ecosystem to respond to change.

Paper

Civic Ecology practice encompasses community gardening, urban woodland restoration, wildlife and stream habitat enhancement, and similar community-driven volunteer activities focusing on the environment. Such practices result not only in enhanced “natural capital,” including biodiversity, landscape heterogeneity, and ecosystem services (MEA 2005, Walker & Salt 2006), but also foster social capital, such as when adults working together develop trust, become involved in local policy-making, and form partnerships with non-profit associations (Golding 2006). Civic Ecology practices embody a new kind of citizen environmentalism that integrates social and biophysical elements in a system, and thus may be more relevant in today’s urbanizing world than a traditional environmentalism focused on preserving pristine natural areas (Light 2003, Tidball & Krasny 2007).

Civic Ecology Education (CEE) refers to environmental education programs that are integrated into Civic Ecology practices. For example, in the Garden Mosaics program, youth work alongside immigrant and minority adult community gardeners in cities, and learn from the gardeners about planting practices and their connection to the gardeners’ diverse cultural backgrounds (Krasny *et al* 2006). Our evaluation of the Garden Mosaics

program suggests that through integrating an intergenerational environmental education program into an adult Civic Ecology practice (*i.e.*, community gardening), social and natural capital may be enhanced above that which is created through the Civic Ecology practice alone. For example, adult gardeners reported feeling connected to youth (social capital) and the youth created new raised beds in the gardens (natural capital). Thus, CEE programs may have community or ecosystem outcomes in addition to impacts on participants. In this paper, we draw from several ecosystem theories focusing on learning and sustainability to further an understanding of the relationship of environmental education to other components of socio-ecosystems.

Because CEE involves integration of learners into groups of adult or other more experienced “civic ecologists,” socio-cultural theories that emphasize learning as moving from peripheral to full participation in communities of practice are relevant (Rogoff *et al* 2003, Wenger *et al* 2002). Further, ecological views of learning and participation that focus on the interaction of learners with their environment, resulting in changes in both the learner and his/her environment, are particularly useful. For example, Barab & Roth (2006) use the term “affordance network” to describe the multiple elements of the context in which learning takes place (*e.g.*, people, environment, and tools), and the term “effectivity sets” to refer to the skills or behaviors that allow an individual to realize the learning possible through an existing affordance network. Further, learners may transform existing affordance networks in the process of learning. According to Barab & Roth (2006), the coupling of an effectivity set to an affordance network forms an intentionally bounded system, and such systems may change through the dynamic individual-environment transactions that transpire across time and space. Learning is an ecological (as opposed to an individualistic) phenomenon, that is distributed within a system and that enables the learner to engage in progressively more adaptive individual-environment relations (Barab & Roth 2006). The story of volunteer efforts to restore degraded prairie and savannah habitats in Chicago provide a case study of how, through a series of informal planting and land management experiments over a number of years, a group of “civic ecologists” both learned adaptively and enhanced the ecosystem services provided by urban open space (Stevens 1995).

In their description of the social learning that occurs through stakeholder engagement in watershed management, Pahl-Wostl *et al* (2007) echo these ideas about ecosystem transformation through adaptive learning. According to Pahl-Wostl *et al* (2007), social learning results from an interplay among three elements: context formed by a given governance and physical system (similar to affordance networks), a process formed by a set of management practices (similar to the adaptive learning processes described by Barab & Roth 2006), and a series of outcomes that change the original institutional and environmental context through a sort of feedback loop.

Feedback loops, coupled with asset-based approaches to community development and education, also provide a critical lens through which to view changes to the socio-ecosystem that occur through learner-environment interactions in CEE programs. As opposed to educational approaches that use a negative human impact on environment as a starting point, CEE programs begin with a human-nature interaction that can be viewed

as a community asset, *i.e.*, ongoing community gardening, habitat restoration, and other Civic Ecology practices within the community. Through integrating a youth component into such practices, CEE creates positive feedback loops that may lead to community and ecosystem resilience. For example, adult gardeners feel empowered by the youth's interest in their traditional knowledge of plants, and thus become further engaged in gardening and youth education. The youth in turn help build new garden plots. In short, the affordance networks of Barab & Roth (2006), or the social learning contexts of Pahl-Wostl *et al* (2007), are changed through these positive feedback loops.

In addition to theoretical frameworks focusing on ecological views of learning, resilience theory provides a useful perspective for viewing socio-ecosystem level outcomes of CEE programs. Resilience refers to sustainability of socio-ecosystems in the face of disasters and smaller-scale disturbance (Folke *et al*, 2002); because all systems are subject to change or disturbance, understanding how one might build resilience is critical to sustainability. The Civic Ecology practices and CEE programs we have described thus far embody and foster a number of attributes of resilient socio-ecosystems, including biological and cultural diversity, ecosystem services, adaptive or social learning, social capital, self-organization, multiple forms of governance, and innovation (Krasny & Tidball 2008a,b,c, Walker & Salt 2006). We focus here on the last three of these attributes as we have discussed the others above. Self-organization refers to properties that emerge from a system and which are greater or different than the individual activities of organisms (including humans) within the system. For example, the activities of volunteer community gardeners or stream monitors result in novel ways of managing blighted open space in cities or watersheds (*c.f.*, Olsson *et al.*, 2004). Further, these Civic Ecology practices generally involve partnerships among multiple non-profit environmental and citizens groups, government agencies, and universities, and thus represent multiple forms of governance. Finally, we consider the Civic Ecology practices, whether they be community gardening, volunteer habitat restoration, or watershed monitoring and enhancement, as innovations that provide an alternative to more top-down forms of natural resources management, and perhaps more importantly, suggest a new way to envision the *connection between people and nature*, rather than humans and nature as independent of each other, in socio-ecosystem resilience.

In short, CEE programs designed around resilience systems theory readily incorporate goals related to fostering learning and sustainable socio-ecosystems. They do so in part through integrating two notions of participation, *i.e.*, Rogoff *et al.*'s (2003) intent participation and Jensen & Schnack's (1997) democratic participation. In the habitat restoration and community gardening programs described above, youth work alongside more skilled adults to enhance the environment and community, and in so doing develop a number of competencies, including science understanding, research and gardening skills, ability to form social networks and participate in civic associations, and sense of being able to make a difference in one's community. In addition to building such "human capital," CEE programs can foster natural and social capital, and embody many additional the attributes of resilient socio-ecological systems. We currently are developing a Civic Ecology and CEE research program; questions we propose to address include: What sorts of adaptive, social, and environmental learning occur among civic

ecologists and participants in CEE programs? What sorts of positive feedback loops leading to greater community sustainability occur as a result of an educational intervention in conjunction with an ongoing Civic Ecology practice? How do community-level impacts of CEE contribute to local resilience and sustainability, based on existing measures of sustainability and resilience in socio-ecological systems? We are hopeful that such a research program will further our understanding of environmental education approaches that reflect current notions of environmentalism in an increasingly urban world, and that integrate learning as a part of building more resilient socio-ecological systems.

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