# Why Is Understanding Urban Ecosystems Important to People Concerned About Environmental Justice?

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**Keywords:** environmental justice · culture · values · motivation · affordable housing · poverty

Ecosystems, and more specifically urban ecosystems, represent important models for understanding particular places, environments, or regions. Even though ecologists generally view ecosystems as functional and geographic units, we suggest that ecosystems should also be viewed as cultural constructs. By this we mean that understandings of ecosystems exist within a cultural context, and meanings assigned to ecosystems cannot help but reflect this cultural context. Thus, understandings of nature are themselves cultural constructions, even though their referents have independent standing as biological realities (Kirsch 1999).

Environmental justice is both a field of study and a social movement that seeks to address the unequal distribution of environmental benefits and harms and asks whether procedures and impacts of environmental decision making are fair to the people they affect. A primary issue for people concerned about environmental justice is that some groups, most often communities of color and low-income communities, face a disproportionate exposure to environmental health risks such as air and water pollution, and environmental hazards such as landfills, incinerators, sewage treatment plants, and polluting industries. As with ecosystems, environmental justice can also be understood as a cultural construct—one that focuses on the class and racial aspects of environmental concerns.

This chapter begins by examining in more detail the perspective of ecosystems and environmental justice as cultural constructs. Understanding the connections between urban ecosystems and environmental justice concerns is an important first step and will prove helpful in identifying common areas of knowledge in supported sustainability. Following these conceptual perspectives, specific reasons are presented as to why an understanding of urban ecosystems is important to people with environmental justice concerns. Finally, three strategies are offered to strengthen the connection between an understanding of urban ecosystems and environmental justice.

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Originally Published in 2003 in Understanding urban ecosystems: a new frontier for science and education, Springer, Berkowitz, A.R., Nilon, C.H., and K.S. Hollweg (eds.), pp 46–57
J.M. Marzluff et al., *Urban Ecology,*

## Understanding Ecosystems and Environmental Justice as Cultural Constructs

### *Urban Ecosystems*

While it is true that biological realities such as species present, the amount of water available, climatic conditions, flows and patterns of resource exchange, and so on ultimately set the limit for a region's political, economic, and social institutions, we hypothesize that if ecosystems, be they urban or rural, are not understood within a cultural context, then we fail to fully understand them. An ecosystem as a culturally defined construct says more about ourselves than perhaps about ecosystems, and we must therefore understand the values and belief systems that shape and motivate behavior toward ecosystems, particularly if we hope to explain why people protect or exploit the Earth (Cronon 1996).

Cultural constructs may be defined as mental representations of external reality that are unique to the human species (White 1949). Humans have an extraordinary ability to construct, symbolize, and name the world. Language or combinations of symbolic constructions are used to organize thoughts for understanding and meaning, for organizing behavior and management, and for envisioning and planning the future. Humans name elements of the world for specific purposes. Terms such as wildlife, park, virgin forest, externality, carbon sink, and brownfield are examples of how we construct conceptions of the world. Such conceptions are often for the selfinterests of certain groups and their use or application can influence the building and maintaining of urban ecosystems.

Our speech, our work, our play, and our social life, our ideas about ourselves and nature all exist within a cultural context that is historically, geographically, and culturally determined and cannot be understood apart from that context. Thus, the way we understand an ecosystem, the way we see and value an ecosystem is a construct of a particular culturally determined context (Cronon 1996). When we think of ecosystems or modify them, however, we think of nature—not culture. Cities are more visible cultural constructions; they are places where ecosystems have been transformed by humans to support urban habitats that bear little resemblance to nature.

We contend that conceptions of ecosystem education, management, policy, planning, and design are based in cultural values of efficiency, beauty, convenience, and utility. Decisions about ecosystems are therefore value-laden. Forests cannot be managed or planned unless decisions are made about whom they will serve. Will they serve industry, local human communities, or non-human species? More specifically will they serve the spotted owl or the English sparrow; hikers or hunters; naturalists or lumbermen or some combination of the above? Will forests be managed for native oaks or Norway maples, jack pines or walnuts (Cronon 1996)?

In an urban environment we also need to consider the parts of an ecosystem that are managed for affordable housing, the business community, industrial production, landfills, incinerators, sewage treatment plants, urban parks, and recreational facilities. What do the spatial relations of these entities say about other cultural constructs such as race, class, and gender? We must ask ourselves the question: Who benefits and who loses from these culturally defined constructions? The answers to these questions depend upon the cultural values and belief systems of a particular place and people. In essence, we need to deconstruct and examine our notions of ecosystems to discover their core meanings.

To understand the values and motivations that shape our actions toward an ecosystem and to explain our actions that abuse that system, we should be more concerned about the impact of culture. Many of our values and motivations are steeped in the marketplace and the immense power of the accumulation system. Culturally transformed and commodified ecosystems are another extension of the market, producing both "social goods" and "social bads" and alienation from the natural world in which we live. Externalities such as hazardous waste are traditionally ignored by the market

system and often find their way into neighborhoods with high proportions of low-income residents or people of color; these communities, themselves struggle to be valued and fully respected by the market system.

## *Environmental Justice*

Environmental justice as a cultural construct challenges the absolute authority of the market system and places emphasis on the interconnections between environmental quality, social justice, and civil rights. With a specific focus on distributional equity, environmental justice adds new layers of analysis to the field of environmental science. Just as environmental scientists examine how human actions can alter local, regional, and global ecological systems, environmental justice advocates call attention to the environmental repercussions of human actions that threaten and disrupt particular social systems.

Environmental injustice can cover a very broad range of environmental disparities and the unequal enforcement of environmental regulations (Goldman 1994; Lavelle and Coyle 1992). In an analysis of 64 empirical studies, Benjamin Goldman (1994) found an overwhelming body of empirical evidence that people of color and lower incomes face disproportionate environmental impacts in the United States. All but one of the 64 studies found environmental disparities either by race or income, regardless of the kind of environmental concern or the level of geographic specificity examined. One of the most influential investigations of environmental injustice was a national study on the distribution of hazardous waste sites that was conducted by the Commission for Racial Justice (CRJ) of the United Church of Christ (1987). The CRJ study revealed that the proportion of minorities residing in communities with a commercial hazardous waste facility is about double the proportion of minorities in communities without such a facility. Where two or more facilities are located, the proportion of residents who are minorities is more than triple. Furthermore, the CRJ study and others have shown that race is often the single best predictor of where commercial hazardous waste facilities are located (Commission for Racial Justice of the United Church of Christ 1987; Bryant and Mohai 1992).

Today people of color and low-income communities across the country are rebelling against the siting of locally undesirable land uses in their communities (Taylor 2000; Tesh and Williams 1996). Through these struggles, people concerned about environmental justice are deconstructing the belief that such communities are valueless. They are seeking to make their communities safe, healthy, viable, and productive. Often these activists are focused on specific places within urban ecosystems that experience the brunt of toxic and hazardous waste and polluting industries; they decry environmental racism and distrust government and the scientific community because neither provides answers to their demands for certainty or immediate solutions. As a result, many community groups are doing their own research in order to find answers to their questions, and to reconstruct their communities to be more viable and livable places.

The struggle of two community groups—the Alum Crest Acres Association and the South Side Community Action Association—representing a predominantly middle-class African American neighborhood on the south side of Columbus, Ohio clearly demonstrates such concerns. Since the mid-1980s the community has voiced numerous environmental and health complaints about a Georgia-Pacific resins facility in the neighborhood. Community concern about the facility peaked in 1997 when chemicals were improperly mixed and exploded violently, leaving one worker dead, several others injured, parts of the facility in ruins, and many residents upset about property damage and a host of alleged health impacts (Edwards 1997). Frustrated with the lack of response from the Columbus Health Department, the community groups applied for and received funding from the United Way to conduct their own health study. The funding for the study, however, was temporarily suspended due to the influence of local government officials (Columbus Dispatch 1999). The community groups have also filed a complaint under Title VI of the 1964 Civil Rights Act with the

Office of Civil Rights of the U.S. Environmental Protection Agency (USEPA) alleging a discriminatory impact from permit decisions by the Ohio Environmental Protection Agency concerning the Georgia-Pacific facility. The civil rights complaint was recently accepted for investigation by USEPA. Ohio EPA is also under investigation currently by USEPA for failing to adequately enforce environmental regulations (Edwards 2000). The above represents only one of many communities where people of color and low-income groups are disproportionately impacted by environmental hazards.

## Connecting an Understanding of Urban Ecosystems with Concerns About Environmental Justice

A deeper and more comprehensive understanding of urban ecosystems will perhaps provide the incentive for a paradigm shift to knowledge that is more sustainable and that will change how we build and reconstruct healthy and livable urban ecosystems. When we speak of sustainable knowledge, we use "sustainable" as an adjective to describe knowledge just as others use the term in sustainable development. Sustainable knowledge is broader than sustainable development in that the former is knowledge that guides our behavior and our understanding of nature. When we speak of sustainable knowledge, it is not knowledge that will remain static, but it is knowledge that mimics nature. It is knowledge that is consistent with and not disruptive of the Earth's life cycles, and it is knowledge that will sustain plant and animal species (Hawken 1993). In nature, the waste of one life form becomes food for another life form. In the same way we need to create knowledge so that the waste from one industry will become the raw materials for another (Anderson 1998). Such a sustainable knowledge conception of urban ecosystems is needed to help eliminate the environmental injustices present in so many cities.

An urban ecosystem built upon injustice will not survive. When people are not allowed their fair share of market benefits but are saddled with more than their fair share of environmental burdens, an ecosystem view tells us that such disparities and imbalances will eventually create problems for the entire system. This emphasis on social dimensions such as race, class, and justice adds important new dimensions of analysis that have not yet been considered in current understandings of humans as components of ecosystems.

Environmental justice often involves the struggle of a particular neighborhood or community against a local polluting industry or facility. A better understanding of ecosystems can help environmental justice advocates connect their specific concerns to broader, regional issues that may reveal significant environmental and/or health concerns. For instance, besides having impact on people of color in a low-income neighborhood, emissions or waste from a facility also may be harming a preserved area or estuary. The work of Walsh, Warland, and Smith (1997) has shown that when environmental justice advocates establish coalitions and partnerships with other groups and institutions, they are much more successful than if they had only focused on the environmental justice aspects of the problem.

For people concerned about environmental justice, knowledge of an ecosystem's characteristics is very important. For example, after one community on the south side of Chicago learned how emissions from a proposed incinerator would combine with the prevailing wind patterns to disproportionately impact their neighborhood, a new environmental justice organization was formed (Schwab 1994). In the Columbus, Ohio, example cited earlier, there have been numerous concerns expressed about contamination of the underground aquifer. These concerns, however, have not been fully explored in terms of what an ecosystem perspective can reveal regarding water flows and other vital characteristics.

Another way to understand and develop the connections between urban ecosystems and environmental justice is through geographic information system (GIS) applications. Such techniques

have become an important tool for those with environmental justice and ecosystem concerns. Combining economic, social and environmental data will support better-coordinated efforts by all involved parties. GIS can help environmental justice advocates better understand the characteristics and dimensions of ecosystems and it also can help ecosystem scientists become more fully aware of the important overlap between physical, ecological, and social dimensions of an ecosystem.

## *Strategies*

In order to strengthen the connections between environmental justice and understanding ecosystems, we offer the following three strategies: (1) promoting community-based research initiatives; (2) incorporating environmental justice concerns within a sustainable knowledge construct of urban ecosystems; and (3) supporting the formation of a new type of professional that will be able to forge the connections between understanding urban ecosystems and concerns about environmental justice.

### Promoting Community-Based Research

There must be a vigorous effort to increase community involvement in designing initiatives that promote the understanding of urban ecosystems and environmental justice. This emphasis on participatory research or community-based research is highlighted in the recent Institute of Medicine (1999) report, *Toward Environmental Justice: Research, Education, and Health Policy Needs* and has been supported by other leading research institutions. Our emphasis here on community-based research is not to exclude other research approaches, but to suggest that given particular settings and desired outcomes, some approaches are more appropriate than are others. Table 1 offers a modified version of Patton's (1990) typology of research purposes and explains some of the differences in research approaches based on a number of variables.

We emphasize a community-based research approach for the following three reasons: (1) it focuses the locus of control of knowledge within the community; (2) people feel they have more control over their lives by being actively engaged in a democratic process of creating knowledge for sustainable and viable communities; and (3) by understanding the role of knowledge and culture. A fundamental difference between community-based research and both action research and basic research is that rather than seeking simply to resolve a problem or to expand knowledge, community-based research involves participants in challenging basic cultural constructs and knowledge that may support unsustainable practices or conditions. In analyzing data from a national study of community-based research in the United States, Sclove, Schammell, and Holland (1998) note that community-based research processes differ fundamentally from mainstream research in being coupled relatively tightly with community groups that are eager to know the research results and to use them in practical efforts to achieve constructive social change. Community-based research is not only usable, it is actually used and, more than that, used to good effect.

In many cases community groups concerned about environmental justice and involved in participatory research have been very successful in problem solving (Schafer, et al. 1993). This process does not mean, however, that they would do a better job than a researcher from a university community—this is hardly the point. The point is that they feel that have control over what happens in their community by being involved in a participatory process. Most importantly, community-based research provides the opportunity for people to learn about their communities (Israel, et al. 1998). This is particularly important in terms of understanding urban ecosystems as cultural constructs, with all strengths and weaknesses that such a concept presents.

**Table 1** A Typology of Research Purposes

| | Basic Research | Action Research | Community-Based Research |
|---|---|---|---|
| Focus of research | • Questions deemed important by one's discipline or personal intellectual interest | • Organization and community problems | • Solve problems and identify societal causes of problems |
| Goals | • Knowledge as an end in itself; discover truth | • Solve problems in a program, organization, or community | • Advance practical knowledge<br>• Solve problems and create systemic change<br>• Empower participants and strengthen capacities |
| Key assumptions | • The world is patterned; those patterns are knowable and explainable | • People in a setting can solve problems by studying themselves | • People in a setting can understand, confront, and change oppressive forces |
| Desired results | • Contribution to theory | • Solving problems as quickly as possible | • Changing societal structures that created problems |
| Investigator's relationship with providers of data | • Subjects/Objects<br>• Detached and external | • Clients/subjects<br>• Agency control<br>• Internal or external | • Participant and researcher co-control<br>• Responsive to community needs<br>• Internal priority with external help |
| Utility of research for providers of data | • Low likelihood (atleast not directly or soon) | • Low to medium depending on agency status and role | • High |
| Who benefits from research | • University<br>• Scientific community or other researchers<br>•"Trickle down" to policy makers | • Client agency<br>• Clients of agency<br>• Policymakers, community leaders | • Participants and community members<br>• Total system (conflicting parts and interest groups)<br>• Constituency |

*Source:* Adapted from Patton (1990) and Chesler. *Personal communication*.

Community-based research can also strengthen or build new social relationships and enhance social trust. This is essential in situations that are complex or involve controversial and value-laden issues. There is a long history of outside researchers producing work that has had devastating impacts on people of color such as the Tuskegee Study (Hatch, et al. 1993; Thomas 1991), Jensen's (1968) research on black children, Schockley's (1992) work on intelligence, and Moynihan's (1965) report on black families.

Community-based research, though, is not at present a prominent form of research in the United States. Fig. 1 clearly shows that community-based research accounts for only a small fraction of research expenditures in the United States. It is not the type of research that usually gets funded and it may require many years of work in order to establish the necessary community trust and participation. Furthermore, many of the results of community-based research—such as community empowerment—are not standard research outcomes and are therefore difficult to quantify. Despite the lack of attention given to community-based research, we still believe it offers the most appropriate methodology that can enable people to deconstruct the cultural conceptions of urban ecosystems while empowering them to use an understanding of urban ecosystems to address environmental injustices. The Loka Institute in Amherst, Massachusetts has spent several years studying the idea

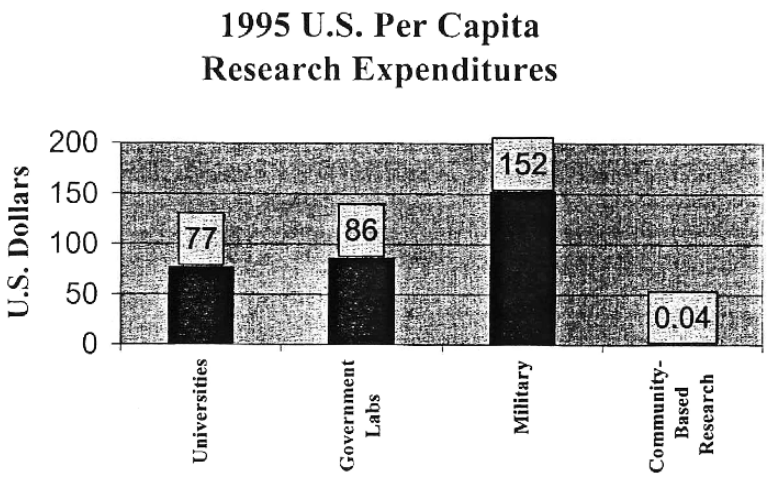


**Fig. 1** Comparison of Research Expenditures. Adapted from Sclove, Schammell, and Holland (1998)

of community-based research and suggests that the university-affiliated community research centers in Holland, popularly known as "Dutch Science Shops," offer one approach to more successfully promote community-based research in the United States. Through such centers, the Dutch are able to invest in community-based research at 37 times the U.S. rate (Sclove, et al. 1998).

## *Incorporating Environmental Justice in Urban Ecosystem Understandings*

Our second strategy of incorporating environmental justice concerns within the context of understanding urban ecosystems builds directly on the opportunities for local learning emphasized with community-based research. Although people concerned about environmental justice often place health and survival issues as top community priorities, they must place these priorities in the context of the failure of urban ecosystems; they must make the connection between healthy ecosystems that mimic nature and just social systems. Those gathered at the First National People of Color Leadership Summit understood this when they established the 17 Principles of Environmental Justice and acknowledged that environmental justice affirms the ecological unity and interdependence of all species, and affirms the need for urban ecological policies to clean up and rebuild cities in balance with nature (Newton 1996). These principles challenge the unsustainable aspects of urban ecosystems and suggest ways in which such systems can be more sustainable.

When environmental justice struggles join with wider regional environmental coalitions, there is greater overall success than if each issue group works independently (Walsh, et al. 1997). It is also important for those working to advance the understanding of urban ecosystems to reach out to environmental justice advocates. Connecting an understanding of an urban ecosystem with a desire for environmental justice can help identify the wider social and environmental implications of a particular concern (landfill, incinerator, industrial facility, etc.). This connection can lead to stronger networks providing greater overall resource mobilization and support. An important tool to help incorporate environmental justice within an understanding of urban ecosystems is GIS (e.g., the "Environmental Mapper" website www.epa.gov/compliance/whereyoulive.html of the USEPA is one option for working with GIS that is accessible to anyone with access to the Internet). Having a visual representation of the overlap of social and environmental concerns is key to building these important partnerships.

### *A New Type of Professional*

Our third strategy, calling for the formation of a new type of professional, is the most important one of all. This type of person is needed in communities, government agencies, and university research institutions. They will need to understand the culturally constructed dimensions of urban ecosystems and be able to forge connections with a variety of groups with environmental justice concerns. Only recently have humans been recognized as components of ecosystems (McDonnell and Pickett 1993). This recognition was seen as a fundamental shift in the understanding of ecosystems. A similar fundamental shift is now needed to promote sustainable knowledge and to fully appreciate the complexity of the human dimension of ecosystems.

Such professionals need to accept the challenges of working directly with communities and should be able to use participatory and community-based research methods to involve community members in the design, implementation, data collection, and analysis of research initiatives connecting environmental justice with a better understanding of urban ecosystems. Institutions also need to recognize the difficulty of such work as it reaches across disciplines and challenges many of the assumptions of scientific inquiry. In a recent analysis of adaptive strategies for ecosystem management, Aley, et al. (1999) provide helpful examples of how some natural resource professionals are successfully integrating social dimensions into natural resource initiatives.

## Conclusions

We have attempted to explore the importance of understanding urban ecosystems from the perspective of people concerned about environmental justice. By understanding ecosystems as cultural constructs, we are pointed in the direction of intentional cultural change to help ameliorate environmentally unjust conditions. Understanding the complexities of race, class, and justice is key to understanding the complexity of urban ecosystems as culturally defined constructs. If we fail to fully understand urban ecosystems, the urban environment will continue to decline and be made more unhealthy by policy decisions that disproportionately affect people of color and low-income groups. An understanding of urban ecosystems also can provide opportunities for additional networking and information exchange that can be very helpful to environmental justice initiatives.

To achieve these ends we have stressed the need for participatory or community-based research initiatives, the importance of placing concerns about environmental justice within the context of urban ecosystems, and finally we have to called for a new type of professional that will be able to use sustainable knowledge to help us reconstruct urban ecosystems to be more livable. The results of such efforts would hopefully be better community-based initiatives that are informed by economic, social, and ecosystem realities. There would also be stronger, more successful coalitions working on environmental justice and expanding the understanding of urban ecosystems. The time for such action is now.

**Acknowledgments** We are grateful for the insights on the issue of community-based research provided by Dr. Mark Chesler, Sociology Department, University of Michigan—Ann Arbor.

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