

Chapter 9

The Buzz About Restoring Mother Nature at the Urban Core



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Abstract The environmental justice approach to restoring the urban core envelops the needs of minorities, including Native American Indians and indigenous peoples, and low-income populations with these and other problematic socioeconomic conditions that impact public health. This chapter provides an overview of existing environmental regulation in the United States indicating two primary objectives: (1) to protect environmental and population health and (2) to identify and remediate the adverse effects of various enacted legislation and programs on minority and low-income populations. This chapter suggests best practices identified in transitioning urban ecosystems in the metropolitan District of Columbia encompassing the area surrounding the United States national capitol. Further recommendations suggest that including the provisions of the Clinton Administration Executive Order 12898 stipulating federal actions to address environmental justice in minority and low-income populations in all policy as intended can improve upon current health and income disparities.

9.1 Introduction

There is much more to the story of the birds and the bees than you may once have been told. Honey bees have been buzzing about the roof of the Paris opera house for nearly 35 years now and they are not alone. In 2015, more than 700 colonies graced the roof tops of local restaurants and landmark buildings in the city of Paris as bees thrive on flora there with significantly less dangerous pesticides than rural areas where they are endangered (Malsang and Uwimana 2017). While bees gather nectar to eventually form honey, they also participate in ecosystem services by pollinating plants—plant proliferation is a significant component of nutrient recycling that helps to purify air (Fig. 9.1). Pollination and air purification (Mace et al. 2012) are two ecosystem services directly and indirectly conducted by bees in the natural environment.

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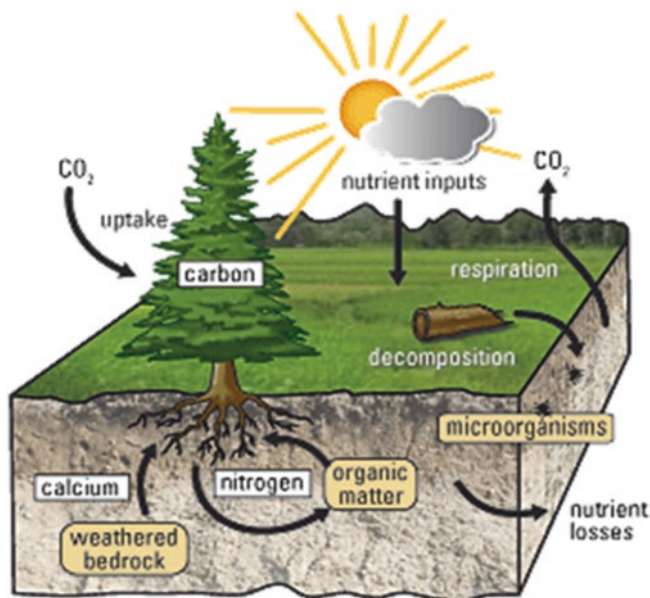


Fig. 9.1 Ecosystem processes, such as the nutrient cycle shown here, depicts how essential elements (e.g., Carbon, Calcium, and Nitrogen) are recycled through biological, chemical, and geological processes in the environment to sustain life (Beldin and Perakis 2009, used by general permission under public domain)

Other ecosystem services include microclimate regulation, water infiltration, noise reduction, cultural services, recreation, and education (Grêt-Regamey et al. 2016; Mace et al. 2012). Restoring a balance in the built environment with the natural environment has been a topic of global importance. For example, the role of ecological restoration through conservation planning and regenerative design is often channeled to efforts in a variety of global urban restoration (Ahern 2016; Boada and Maneja 2016; Conniff 2014; Gobster 2010; Ingram 2008; Niemelä et al. 2010; Ravetz 2016; Ravetz 2015). In the U.S., urban restoration is also equated with addressing environmental urban health disparities under the formidable umbrella of environmental justice (NIEHS 2016). Urban health disparities, commonly known as the social determinants of health, include urban environmental factors such as “the complex relationships between genes and the environment, individual behaviors, access to health services, socioeconomic status, literacy levels, and legislative policies” (NIEHS 2015, *para* 1) influencing the occurrence of and the potential to abate disease.

The National Institute of Environmental Health Sciences (NIEHS) in the United States envelopes two primary goals: (1) reduction of health disparities due to environmental conditions, and (2) educating the population on the ethos of environmental justice (NIEHS 2015). Environmental justice, adopted from an individual movement and brought forth by the U.S. Environmental Protection Agency (EPA),

is defined as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (EPA 2009; NIEHS 2016).

This chapter discusses the current legislative policies that address the urban ecosystem following the environmental justice approach to restoring Mother Nature at the urban core where a large minority population and those with low socioeconomic status reside. Details of the social determinants of health in the urban ecosystem follow emphasizing health and income disparities. Then, the chapter turns to the brief overview of the metropolitan District of Columbia as an example of the restoration of an urban ecosystem that promotes healthy and sustainable living. Finally, the case analysis brings forth general best practices followed by recommendations to fill gaps in the prominent legislative policy of Executive Order 12898 (1994).

9.2 Current Legislative Policies in the Urban Ecosystem

While U.S. federal environmental and health regulation, such as National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190) and the Clean Water Act of 1972, provide standards to protect natural resources against contamination leading to public harm, other legislation stipulates protection for specific population sectors. In 1994, President William J. Clinton signed Executive Order 12898 (1994) stipulating federal actions to address environmental justice in minority and low-income populations, access to human health and environmental planning public information through the Freedom of Information and the Emergency Planning and Community Right-to-Know Acts, and the establishment of agencies to ensure all federal agencies incorporate environmental justice.

The EO established two agencies: (1) an Interagency Working Group (IWG), and (2) the Office of Environmental Justice (OEJ). The IWG is comprised of representatives from the White House and multiple agencies including the EPA Administrator who is tasked as the chair (EPA 1994b). The OEJ “works to protect human health and the environment in communities overburdened by environmental pollution by integrating environmental justice into all EPA programs, policies and activities” (EPA 2017, *para* 1).

Inherently, EO 12898 is linked to Title VI of the Civil Rights Act of 1964 summarily stipulating that any agency or program relating to public or environmental health in receipt of federal funds must comply with nondiscriminatory conditions (e.g., race, color, national origin) or else jeopardize funding (EPA 1994a). Though all agencies receiving federal support are called upon to address disproportionate suffering, “with the exception of the Environmental Protection Agency, very little federal regulatory activity included references to EO 12898” (Geltman et al. 2016, p.143). Funding through the U.S. EPA Superfund has also been under scrutiny for the lack of minorities and low-income populations able to benefit from the program. Recent evaluation of funding allocation and distribution indicate that, “increases in

minority populations, families in poverty, or people without high school diplomas all lower the chances of a Superfund listing” (O’Neil 2007, p.1090). Low participation by the target population is an example of problems with effectiveness of the policy towards meeting the equitable intent of the policy.

While ecosystem services can improve environmental and public health in urban areas and legislation can abate environmental and public harm, the impact of urbanization on ecosystems (e.g., poor air quality, traffic) and thus, urban dwellers, is the other side of the coin. Reputable U.S. agencies, such as the National Institute of Health (NIH), the National Quality Forum (NQF), and others address the unequal problem of health and income disparities in urban ecosystems. Understanding these prominent inequalities in minority and low-income populations is important to addressing the needs of these sectors.

9.2.1 Health Disparities in Urban Ecosystems

“Health disparities ... are differences in the incidence, prevalence, mortality, and burden of diseases and other adverse health conditions that exist among specific population groups” (National Institute of Minority Health and Health Disparities n.d., p.6). In response to mounting health disparities (AHRQ 2017; NIH 2013), the NQF Roadmap for Promoting Health Equity and Eliminating Disparities targets some specific health conditions experienced in disproportionate levels against the general population. They hope to alleviate these inequalities through the development of performance measures linked to policy such as monitoring, accountability and data-driven performance (2017).

The NQF roadmap targets health conditions, such as heart disease, in which those with low income and lower levels of education have a higher prevalence and “African Americans are more likely to die prematurely” (NQF 2017, p.2). The perinatal period, where “infants born to black women are 1.5–3 times more likely to die than infants born to women of other races/ethnicities (CDC 2011, p.1), was another important area of health. Other prominent areas of disease include cancer, abnormal kidney function, and mental illness compounded by various social risk factors associated with higher incidence of these diseases. These social risk factors include “socioeconomic position, race/ethnicity, gender, social relationships, and residential/community context” (NQF 2017, p.8).

Key findings of the Agency for Healthcare Research and Quality (AHRQ) indicate that racial disparities persist in the Black and Hispanic communities and that households with low socioeconomic status (e.g., poor, low income) confirm worse care than affluent families (2017, p.1). Overall, the report demonstrates that greater than half of 250 assessment measures within several topical indicators (e.g., access to care, preventive care, women’s health, affordable care) are not improving.

9.2.2 *Income and Other Compounding Disparities in Urban Ecosystems*

“Income can influence health by its direct effect on living standards (e.g., access to better quality food and housing, leisure-time activities, and health-care services)” (Beckles and Truman 2011, p.13). Thus, income inequality is a major factor in health status. In 2016, the black population had 22% of their people in poverty with Hispanics at 19.1% compared to white people in poverty at 11% (Semega et al. 2017, p.13). Those of minority status comprise more than 40% of people impacted by poverty or about 16.7 million of the 40.6 million people in 2016 that were classified as in poverty; the U.S. poverty rate hovered at 12.7% during the same time (Semega et al. 2017, p.12). Jarosz and Mather graphically depict the level of poverty in the U.S. from 1989 to 2014 indicating that “high levels of poverty and inequality are more prevalent across all types of counties [more than 2/5th of all counties] today than two decades ago” (2016, *para* 4). The sheer number impacted by income inequality also has implications in the capacity for the urban ecosystem, where many low income and minorities reside, to incorporate sustainability goals.

The impact of urban income disparity, one of many fractured human characteristics of urban ecosystems, has been studied recently in relation to the capacity of neighborhoods to achieve social and environmental sustainability. Other factors also reveal how mass urbanization in the existing infrastructure must be overcome to introduce and sustain ecosystem services into the built environment. They include the “compounded deprivation, racial cleavages, civic engagement, institutional cynicism, and segregated patterns of urban mobility and organizational ties that differentially connect neighborhood resources” (Sampson 2017, p.8957). The study of three U.S. cities (e.g., Boston, Chicago, and Los Angeles) demonstrates that the future of “smart cities” is dependent on the capacity to address neighborhood diversity and the social welfare needs of specific population sections therein (Sampson 2017).

Thus, “global urbanization creates opportunities and challenges for human well-being and transition towards sustainability” (Leuderitz et al. 2015, p. 98). Recognizing the impact of social determinants, such as income inequality, is just the beginning. Addressing the long-term population growth in urban areas and the impact of climate change there (e.g., wastewater contribution to flooding, microclimatic heat effects of heat islands due to increased city temperatures derived from built infrastructure, air pollution from traffic congestion) is important. Sampson’s (2017) premise also supports the urgency of supporting the minority population because of the cumulative benefits to all urban residents towards sustainability. Therefore, addressing inequalities that impact the social and environmental fabric of urban populations must become a high priority.

Notable is that each city or urban designation has a unique history, cultural attributes, and built environment vested within the natural surroundings requiring special attention by residents, politicians, and skilled urban planners. We demonstrate how urban planners and various stakeholders adjust to the local environmental conditions and population needs in the U.S. capital of Washington, DC.

9.3 Case Study: Metropolitan Washington, DC

The changing dynamics of industrialization, globalization, urbanization, immigration, and others has left many locations strained of natural resources and sometimes abandoned to population sectors unable to relocate. Faced with urban blight and decline, three methods are prominent in reclaiming deteriorating urban landscapes. First, urban regenerative design—a restorative process introducing indigenous species and natural diversity into a built environment to promote self-sufficient nutrient cycling; second, ecological restoration—process of removing harmful contaminants; and conservation planning—a comprehensive natural resource plan spanning one of many components from grazing to wildlife preservation. Faced with declining natural resources, we look at the metropolitan area of the U.S. national capital of Washington, DC to demonstrate how an infusion of ecosystem services through these methods can reclaim resources with a positive impact on public health.

9.3.1 *Anacostia River*

Sometimes the buzz is about America's national past time—baseball. But what does baseball have to do with restoring Mother Nature at the urban core? A lot! The playing field of the Washington Nationals, a Major League Baseball™ franchise in the National League Eastern Division, is a brownfield development and a green ball-park (MLB 2017). A brownfield development is repurposed land likely fraught with soil contaminants, pollution, or sometimes early restoration efforts gone wrong. But the ball park, completed in 2005, is one of the many improvements along the more than 8-mile portion of the Anacostia River (Fig. 9.2) that flows from Maryland to Washington, DC where it meets the Potomac River. Both rivers feed the Chesapeake Bay so work upstream is vital to the recovery of the ecosystem there.

After industrial pollutants, sewage, and harmful sediments from agricultural runoff accumulated in the waterway by 1972, the Anacostia River underwent dredging operations leading to changes that transformed the area into a recreational area in the 1980s. However, three centuries of exploitation were a difficult obstacle to overcome as the area ecosystem was further damaged by this early attempt to revitalize the area. In 1989, area conservationists formed the Anacostia Watershed Society and began plans to restore the original freshwater tidal marsh that once served Anacostan Native Americans with a variety of wildlife and vegetation (Anacostia Watershed Society 2017). With assistance from the United States Geological Survey (USGS) and a consortium of organizations (e.g., Baltimore District of the Army Corps of Engineers, District of Columbia Department of Environmental Health, The Patuxent Wildlife Research Center and the University of Maryland) (USGS 2008), the long journey to restore the marsh and wetland areas was underway (Anacostia Watershed Society n.d., 2017). The conservation of a variety of natural habitats for indigenous species such as fowl and fish, as well as abatement for invasive species,



Fig. 9.2 The Bladensburg Wetlands was a landfill known as “ANA 11” until the Maryland State Highway Wetland Mitigation Project transformed the area into this natural water filter and wildlife habitat in 2008 (Photo courtesy of the Anacostia Watershed Society, used by permission)

continues in their long-term vision of a national park conservatory and environmentally responsible resource for public recreation.

There is still much work to be done toward the advocacy group goal of completion by 2025 to address infrastructure and toxic hotspots to permit full water contact events like swimming and fishing. While funding was primarily gained from negotiated settlements, key work continues to unfold in the interest of public health under the auspices of environmental justice. About 17,000 people annually consume fish caught in the Anacostia River. Research to determine the public health impact on the vast number of minority fisherman that consume fish caught in the river is a major concern due to several remaining contaminated areas (Lambert 2014; Wilson 2014). Wilson recommends that limiting water contact and reducing consumption of fish caught in the river is advisable until contaminated areas are addressed in ongoing and forthcoming projects (2014).

A far cry from the period when the Anacostia River was a haven for disease, the area is a growing example of collaboration between nonprofit, academic, and government agencies addressing multiple public administration services through ecological restoration. Mixed-use development, public transportation access and new housing in “The Yards” (Cooper 2016) together anchor 800,000+ residents who live in the over Anacostia Watershed spanning more than 170 square miles (Cooper 2017).



Fig. 9.3 The Anacostia River continues to transform the watershed with pedestrian and education friendly developments, such as the Plans for the 11th Street Bridge Park (Photo Courtesy of OMA+OLIN, used by permission)

Plans to improve the area include the 11th Street Bridge Park (www.bridgepark.org), a project of the Ward 8 nonprofit Building Bridges Across the River, will reutilize existing pylons from the old bridge to create a pedestrian walkway connecting the DC side of the river with Anacostia (Courtney 2017) (Fig. 9.3). The project endeavors to physically and socially connect residents from both sides of the Anacostia River—Washington, DC and Anacostia.

9.3.2 *Chesapeake Bay*

Addressing environmental contaminants in the upstream Anacostia River watershed is important to ongoing Maryland Department of Natural Resources (DNR) projects in conjunction with the Chesapeake Bay Trust (CB Trust 2015) and several organizations. The Chesapeake Bay Trust located in Annapolis, MD offers multiple resources for education, grants, capacity building, and opportunities for civic engagement. “The mission of the Chesapeake Bay Trust is to promote public awareness and participation in the restoration and protection of the water quality and aquatic and land resources of the Chesapeake Bay region and other aquatic and land resources of the State” (CB Trust 2015, *para 1*).

The CB Trust will simultaneously address stormwater runoff by adding green space at MedStar Harbor Hospital, one of 15 newly announced projects, which will also aid in the overall well-being of the patient population (DNR 2017). Combining outdoor patient care with environmental strategies to offset the built environment through green space planning is an example of multipurpose planning that is both effective and efficient.

This green infrastructure project is one of more than a dozen projects funded by various Watershed Assistance programs from 2016-2017 spanning concept design for soil conservation along with restoration of streams and ponds to reduce the problem of stormwater runoff in the area (DNR 2017). Multiple stakeholders from the

city of Baltimore; town of Templeville; faith-based organizations such as Peoples' Community Lutheran Church; and federal funding provide an overarching water quality improvement plan for the area serving several counties (DNR 2017).

Many local and federal organizations provide several ways to inform and engage the public. For instance, the CB Trust is one example of a local portal (<https://www.youtube.com/user/ChesBayTrust>). Other public information opportunities regarding environmental justice can be obtained by subscribing to a EJ Listserv (https://lists.epa.gov/read/all_forums/subscribe?name=epa-ej). Finally, another agency that can provide financial guidance and support is the USDA Natural Conservation Resources Services (<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/>). Announcements range from opportunities to volunteer, learn about conservation, and access funding and other support to address environmental conditions that impact health and well-being in your community.

9.4 Discussion and Recommendations

Many agree that EO 12898 was groundbreaking in bringing the problem of environmental conditions that disproportionately impacts minority and low-income populations; but further actions are required to reach the intended goal of environmental justice. This section highlights some best practices in urban ecological restoration and suggests how recognized gaps in EO 12898 can be a platform for improvement.

9.4.1 *Best Practices in Urban Regenerative Design*

Several overarching lessons can be learned from the urban ecological restoration projects in the brief case study. For example, overcoming decades of contamination is no small task. While advocacy is crucial, securing a funding stream is important to see a project come to fruition. Impacting legislation through advocacy strategic litigation and utilizing existing legislation, such as the EO 12898, are methods that both legitimize and fund urban ecological restoration projects. Both approaches represent opportunity but offer different levels of planning as access to funds are allocated differently. Strategic litigation offers a substantial reward for persistent advocacy that builds legal pathways and long-term funding for multiple infrastructure projects required to incorporate sustainable design and restoration. But time and personnel capable of pursuing this path have recognizable limits. On the other hand, EO 12898 provides an established path but funding is dependent on available portion awarded from the federal budget.

Three key ingredients to the success of the Anacostia Watershed Society are important. First, the organization worked diligently to generate a series of legislation to protect the area and hold industry accountable. "Most major issues facing the

river and the parties responsible for them have been identified and held liable to ensure that environmental justice for the river is served” (Anacostia Watershed Society [n.d.](#), p.3). Second, strategic litigation was instrumental in securing a funding stream to support the ongoing advocacy efforts and pay for planned changes to infrastructure that include mechanisms to prevent sewerage overflow and manage stormwater (Anacostia Watershed Society [n.d.](#)). Third, long-term commitment and persistence are essential ingredients.

Overarching lessons learned in the metro DC case is that (1) urban development can accompany ecological restoration, (2) urban planning is a collaborative project across many stakeholders to concurrently address population, wildlife, vegetation and utilization of natural resources such as waterways, (3) economic development can be sustainable, and (4) small scale projects over time can reinvigorate and reinvent significant areas previously written off. Thus, the big picture of Chesapeake Bay improvements suggests the critical nature of multipurpose strategic solutions in small bites that incorporate the varied interests of multiple stakeholders towards a common goal.

9.4.2 How Addressing Gaps in EO 12898 Can Improve Policy

The groundbreaking intent of EO 12898 is monumental in both recognizing and attempting to address environmental justice for minority and low-income populations that have historically and continue to be disproportionately subjected to the ill health effects of environmental hazards. Undeniably, the EO lacks specific guidance on siting and permitting, two major areas where structured rules with substantive standing would be valuable (Huang [2014](#)). “Instead, the Order directed agencies to adopt an [environmental justice] EJ strategy and then implement it. To date, not every federal agency has fulfilled the Order’s EJ mandates” (Huang [2014](#), *para 4*).

Further, mechanisms to draw attention to available funding in target populations have relied on grass root organizations working with local political representatives to acquire information, a right granted by EO 12898, to access funds. That is why state efforts to identify and address specific populations in harms’ way through substantive state legislation (Bonorris [2010](#)) is vital to assessing contaminated sites and housing, establishing public health concerns, and acting as a conduit to funding for population sectors in most need.

Of course, the environmental conditions and population sectors vary widely but the expressed purpose remains the same—meet the needs of “communities across the country [that] continue to be unnecessarily exposed to toxic pollution that threatens their health and quality of life” (Huang [2014](#), *para 8*). Nevertheless, civic engagement is critical to accessing funding to facilitate cleanup. Be a part of the buzz. That means citizens must apply the process of access to information, utilize standards to establish environmental hazards, and work with various agencies to address health hazards related to environmental conditions.

9.5 Summary

This chapter brings forth awareness of the growing concern for urban population growth and the need to expand development inclusive of ecological restoration and regenerative design of ecosystem services. These are viewed considering disproportionate health and income disparities that exist in minority and low-income populations resulting from hazardous environmental conditions. Existing legislation to provide environmental and public health relief for this population sector in the U.S. through the Clinton Administration Executive Order 12898 (1994) underwent a cursory review for areas of improvement. While urban planning with ecosystem solutions are generally custom solutions for a specific area, a review of the case study on the transformation of the Anacostia River Watershed and Chesapeake Bay leads to several general best practices. They include nonprofit advocacy and strategic litigation as a source of funding for the high costs associated with returning ecosystem services into the urban environment. But also speak to the importance of effective and efficient multipurpose strategic planning that serves multiple interests for population health.

Glossary

- Biomass** Release of carbon by burning wood and other organic matter as fuel
- Brownfield development** Repurposed land in the U.S. previously used for industrial/commercial business with poor soil, potentially hazardous soil and other natural resource conditions, and environmental pollutants
- Conservation planning** The record of decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns because of the planning process; the plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities (USDA [n.d.](#), *para 1*)
- Cultural services** One of several ecosystem services; often referred to as the nonmaterial or aesthetic benefits derived from surrounding culture, a sense of belonging, or ethereal experience from nature (FAO 2017)
- Microclimate regulation** One of several ecosystem services; a variance in temperature and humidity experienced locally when compared to surrounding areas such as a city compared to neighboring suburbs
- Minorities** Smaller sector of a larger group; the smaller portion of Native Americans, Hispanics, and African Americans in the U.S. population compared to Caucasians
- Nutrient cycling** An ecosystem process in which biological, chemical, and geological activity in the environment help to recycle elements essential to life such as carbon, hydrogen, calcium, phosphorus, and nitrogen

Regenerative design Instead of just restoring damage, this approach focuses on improving environmental conditions to promote nutrient cycling and other ecosystem services that support life

Soil formation Several factors contribute to soil formation including the breakdown of rock (parent material) over time, climatic conditions, various organisms, and area landscape; also known as pedogenesis

Urban ecosystem The interaction of various elements within a densely populated area such as a city or large metropolitan area (<https://www.britannica.com/science/urban-ecosystem>)

Water infiltration One of several ecosystem services; process where rain or melting snow moves through gaps and other shallow openings in top soil to provide moisture or through sediment to replenish groundwater sources

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