

# Environmental Justice Movement: A Review of History, Research, and Public Health Issues

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*The environmental justice (EJ) movement has galvanized the underprivileged, populations of color, indigenous populations, and the poor to bring attention to the environmental hazards that burden their communities. Evolving into a powerful framework that grassroots organizations employ to address social and environmental inequalities, the EJ movement has provided oppressed communities with a social justice framework to address negative environmental conditions, to fight discrimination in zoning, planning, and community development, and to eliminate environmental health disparities. In this paper, I will detail the history of the environmental justice movement, reflect upon the institutionalization of environmental justice, and discuss the contribution of academia to the environmental justice movement. I will introduce environmental slavery as a new EJ concept using supporting evidence from the literature and field work. I will describe how the new concept can help in the struggle against environmental oppression, to improve public health, and reduce environmental health disparities.*

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The environmental justice (EJ) movement has been important in galvanizing the underprivileged, populations of color, indigenous populations and the poor to bring attention to the environmental hazards that burden their communities. This movement, which has its roots in the struggle for indigenous environmental rights by Native Americans and the tradition of the civil rights movement, has been instrumental in empowering disparately burdened communities to address the environmental context of their lived experiences not captured by the mainstream environmental movement. The EJ movement has evolved into a powerful framework that grassroots organizations employ to address social and environmental inequalities that stifle the stability, vitality, and sustainability of their local communities. Grassroots advocates have for three decades used community organizing, protests, boycotts, lawsuits, research and other tools to seek environmental protection for their communities.

The purpose of this paper is to review and synthesize the literature on the history of

the environmental justice movement, discuss the contribution of academia to the environmental justice movement, and discuss the relationship between environmental justice and public health. This will be done in order to answer the following questions: 1) What impacts have the environmental justice movement had as a social movement? 2) What have been the contributions of academia to the environmental justice movement? After answering these questions, I will introduce environmental slavery as a new concept to bridge environmental justice to public health using evidence from the literature and experiences with community-based organizations to support the validity of the concept. I will also discuss how the environmental slavery concept can be integrated into research, management, and policy initiatives to improve public health, obtain justice, and achieve social change for underserved and disadvantaged communities.

### **History of the Environmental Justice Movement**

There is a long history of people of color struggling against environmental injustice in this country. Native Americans long have fought against colonial and postcolonial forces to protect their indigenous land rights. During slavery, efforts were taken to prevent the use of arsenic in the fields as a pesticide (Gelobter et al. 2005). During reconstruction and Jim Crow, African-Americans fought against racist forces and policies to receive and retain their “40 acres and a mule” and to use land tenure to establish viable communities (Cimbala and Miller 1999; Cox 1997). Before his death, Martin Luther King traveled to Memphis to help striking Black sanitation workers (Bullard 1994a; Bullard and Johnson 2000) obtain better working conditions and pay. In Houston, Texas in the late 1970s, African-American residents filed the first lawsuits charging environmental discrimination against companies who built landfills in their neighborhoods (Bullard 1994a, 1994b).

The contemporary EJ movement was further catalyzed by the 1980s struggle of Warren County, North Carolina residents against the construction of a polychlorinated biphenyl (PCB) landfill in their rural, predominantly African-American community in eastern North Carolina (Bullard 2005; Geiser and Waneck 1994; Bullard 1994b). Local grassroots organizations, environmental activists, national civil rights leaders and others joined to protest the PCB landfill siting (Geiser and Waneck 1994; Bullard 1994a; 1994b). Nearly 500 demonstrators were arrested for their protestation of the siting decision which did not involve the participation of local residents (Bullard 1994b; Taylor 2000). Their efforts led to a national dialogue on EJ issues which had been overlooked by the mainstream environmental movement.

***Classic Environmental Justice Studies.*** Two groundbreaking studies provided evidence that supported the claims of grassroots EJ activists. The U.S. General Accounting Office conducted *Siting of Hazardous Waste Landfills and Their Correlation With Racial and Economic Status of Surrounding Communities*. The 1983 study examined the distribution of landfills in Environmental Protection Agency’s Region IV which covers eight southeastern states (US GAO 1983). The study found that three of four communities containing large hazardous waste landfills were mainly African-American and African-Americans were overrepresented in communities with waste sites, even though they only made up one-fifth of the population in Region IV (US GAO 1983). In addition, the US GAO study found at least twenty-five percent of the populations residing in all four of the communities were

economically disadvantaged (living below the poverty line) (1983).

The Commission for Racial Justice of the United Church of Christ *Toxic Waste and Race in America* study in 1987 compared the demographic characteristics of ZIP codes without waste treatment, storage, or disposal facilities to ZIP codes with a facility. The study found that as the number of facilities increased, the percent minority increased in host ZIP codes. The major conclusion of this study was three out of five African-Americans and Hispanic-Americans lived in communities with toxic waste sites (UCC 1987). In 1990, EJ researchers Bunyan Bryant and Paul Mohai organized the Conference on Race and the Incidence of Environmental Hazards at the University of Michigan (Bryant 1995; Bryant and Mohai 1992). Researchers from around the country presented results that documented and supported the conclusions of the US GAO and *Toxic Waste and Race in America* studies (Bryant 1995; Bryant and Mohai 1992).

The early efforts of the contemporary environmental justice movement culminated with the First National People of Color Leadership Summit in 1991 (Bullard 2005; Bullard and Johnson 2000; Grossman 1994). Six hundred and fifty environmental justice advocates from more than 300 environmental groups of color met in Washington, DC to share their action strategies, redefine the environmental movement from their context and experiences, and develop plans for addressing environmental problems affecting populations of color nationally and globally (Bullard 1994a, 2005). The advocates discussed and developed seventeen Principles of Environmental Justice which have empowered people of color affected by environmental injustice (EJRC 2006; Bullard 2005; Grossman 1994).<sup>1</sup> These principles catalyzed the grassroots EJ movement by providing a multi-dimensional social justice framework for ca-

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<sup>1</sup> The 17 Principles of Environmental Justice were drafted and adopted at the First National People of Color Environmental Leadership Summit held on October 24-27, 1991, in Washington DC. They state that Environmental Justice: 1) affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction; 2) demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias; 3) mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things; 4) calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food; 5) affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples; 6) demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production; 7) demands the right to participate as equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement and evaluation; 8) affirms the right of all workers to a safe and healthy work environment without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards; 9) protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care; 10) considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide; 11) must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination; 12) affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all

capacity-building, political mobilization, policy development, and environmental reform.

***Institutionalization of Environmental Justice.*** The work of EJ organizations at the Summit and other events led to the establishment of the Environmental Protection Agency's Office of Environmental Justice in 1992 (US EPA 2006a) to address public concerns about environmental injustice. More progress was made with the chartering of the National Environmental Justice Advisory Council (NEJAC) pursuant to the Federal Advisory Committee Act (FACA) in 1993 (US EPA 2006a). This committee is made of stakeholders from community organizations, educational institutions, industry, local, state, and federal officials, environmental groups and other entities to provide advice to the EPA on collaborative strategies to address the human health and environmental protection needs of disadvantaged and underserved communities and to ensure that the goal of environmental justice is integrated in Agency policies, programs, and priorities (US EPA 2006a).

The signing of Executive Order 12898 on Environmental Justice in 1994 by President Clinton (Clinton 1994) was another important milestone in the institutionalization of environmental justice in protecting human health and the environment for all communities and remedying the disproportionate burden of environmental pollution on populations of color and disadvantaged communities. The Executive Order seeks to "address environmental justice in minority populations and low income populations which requires each federal agency to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately higher and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low income populations in the U.S., its territories, and possessions". The EJ Executive Order reinforces Title VI of the Civil Rights Act of 1964, which prohibits discrimination by programs receiving Title federal funds (Bullard 2005) (i.e., highway infrastructure projects) and emphasizes compliance with the National Environmental Policy Act (NEPA) (Bullard 2005). NEPA requires that environmental impact statements (EIS) are produced to detail environmental effects of proposed federal actions that may affect the environment and human health (Bullard 2005). Unfortunately, court cases, lack of federal oversight, and a loophole in NEPA (i.e., lack of mandate for health impact assessment performed in conjunction with environmental impact statement) have limited the overall efficacy of Executive Order 12898.

### **Environmental Justice Terminology**

An important driver of the environmental justice movement has been the rallying cry of

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our communities, and provided fair access for all to the full range of resources; calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color; 14) opposes the destructive operations of multinational corporations; 15) opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms; 16) calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives; and 17) requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to insure the health of the natural world for present and future generations.

*environmental racism* by EJ advocates. Dr. Benjamin Chavis introduced the term during the Warren County, North Carolina landfill protest in 1982. He states (Chavis 1994, xii):

*Environmental racism* is racial discrimination in environmental policymaking and enforcement of regulations and laws, the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the presence of life threatening poisons and pollutants for communities of color, and the history of excluding people of color from leadership of the environmental movement.

Dr. Robert Bullard supplements this argument by stating environmental racism can be any policy, practice, or directive that differently affects or disadvantages communities of color whether intended or unintended (1994b). This form of racism “combines with public policies and industry practices to provide benefits for whites while shifting industry costs to people of color... reinforced by governmental, legal, economic, political, and military institutions” (1994b). Dr. Bullard’s comments imply that any environmental policies or hazard distribution that disparately affects populations of color provide evidence of environmental racism (Hollifield 2000). The term *environmental classism* has also been used by EJ advocates to discuss environmental injustice in their communities. *Environmental classism* describes the process by which economically disadvantaged and undereducated populations are disparately burdened by environmental hazards particularly locally unwanted land uses (LULUs).

*Environmental racism and classism* have been important in helping EJ advocates inform policymakers about the disparate burden of environmental hazards on the health and sustainability of their communities. Unfortunately, many academics, government officials, and industry representatives have usurped the environmental justice agenda of activists to either: 1) separate the interconnected processes of environmental racism and classism in this country or 2) relegate the use of these terms to only characterize specific, discrete, discriminatory acts without taking into account the sociohistorical racialized processes that construct our social spaces (Pulido 2000) and contribute to these forms of environmental injustice.

The institutionalization of environmental justice in government regulations was a vital step in providing a new resource for grassroots advocates beyond the environmental justice terminology. However, this led to a disagreement on environmental justice terminology between activists, academics and government officials. This disagreement has transformed the EJ movement from one focused on a social change agenda to a movement driven partially by an unhealthy level of bureaucracy, academic science, and inaction.

For instance, Dr. Bunyan Bryant provides an expansive definition of *environmental justice* (1995, 6):

Environmental justice is served when people can realize their highest potential, without experiencing the 'isms.' EJ is supported by decent paying and safe jobs, quality schools and recreation, decent housing and adequate health care, democratic decision-making and personal empowerment; and communities free of violence, drugs and poverty. These are communities

where both cultural and biological diversity are respected and highly revered and where distributed justice prevails.

Yet, the EPA's official definition of environmental justice is more narrowly focused than the environmental justice principles developed through the First People of Color Summit or Dr. Bryant's definition. The EPA (2006b) defines *environmental justice* as:

The fair treatment of 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. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The EPA's definition is problematic for EJ advocates because it does not provide proper avenues to redress the historical burden of environmental hazards on communities of color, poor populations, and indigenous peoples and does not focus on public health, a point of emphasis for EJ advocates. It ignores years of historical environmental discrimination and geographic patterning of environmental and social amenities and disamenities (Bullard 1994b). This definition also excludes social justice and political empowerment as goals, two of the overarching goals of the grassroots EJ movement.

The fundamental problem with the EJ definition is its connection to the EPA's previous use of *environmental equity* to describe the disproportionate impacts of environmental pollution in the US (Holifield 2000). The *environmental equity* definition provided the EPA the opportunity to use science specifically risk analysis methods to measure environmental (in)justice (Holifield 2000). EJ advocates understood that relying on the EPA's risk assessment methodology to measure *inequity* or *injustice* had inherent limitations because science has its own rules about error, confidence, power, and objectivity when statistically proving the existence of an *inequity* or *injustice*. This need for statistical evidence differs from the contextual evidence used by EJ advocates to achieve their social justice agenda.

The results of scientific studies that follow the environmental equity<sup>2</sup> paradigm can

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<sup>2</sup> Environmental equity is defined as the equal distribution of pollution across all racial/ethnic and socioeconomic groups. Additional environmental equity terms include "procedural equity," "geographic equity," and "social equity" (Zimmerman 1993, 1994; Bullard 1994b; Cutter 1995). Procedural equity refers to the extent to which governing rules and regulations, evaluation criteria, and enforcement is applied in a nondiscriminatory manner. Geographic equity refers to the location and spatial configuration of communities and their proximity to noxious facilities, environmental hazards, and locally unwanted land uses. Social equity assesses the role of social factors such as race, ethnicity, class, culture, lifestyles, political power, and other factors on environmental decision-making. Environmental inequality is another EJ term that has been used by Downey (2005) and Brulle and Pellow (2006) to describe the unequal distribution of hazards, land uses, and environmental amenities.

potentially disempower and marginalize EJ communities instead of empowering them to address environmental health issues because non-community members can use these results to designate which environmental justice concerns are valid or invalid. Bullard (2005) comments that this paradigm reinforces instead of challenges the stratification of people, places, and the type of occupations available in EJ communities. Bullard (2005, 13) continues:

This system has institutionalized unequal enforcement of safety precautions; traded human health for profit; placed the burden of proof on the victims and not the polluting industry; legitimized human exposure to harmful chemicals, pesticides, and hazardous substances; promoted risky technologies such as incinerators; exploited the vulnerability of economically and politically disenfranchised communities; subsidized ecological destruction; created an industry around risk assessment... and failed to develop pollution prevention as the overarching strategy.

The EPA's emphasis on using a strict science-based EJ standard in opposition to EJ activists' support of using science and the precautionary principle has eroded the progress of the environmental justice movement in the years since Executive Order 12898. This standard has proven detrimental to EJ advocates who sue government and corporate actors for discrimination using Title VI of the 1964 Civil Rights Act. For instance, the strict standard of intent and causation (Morello-Frosch 2002) has become codified in legal proceedings. South Camden Citizens in Action lost their case against the New Jersey Department of Environmental Protection (NJDEP) on how the state agency addressed the group's claims of civil rights violations and environmental discrimination (Hauge and Peticolas 2006). The US District Court for New Jersey ruled that the permitting of a cement facility by NJDEP did not constitute intentional discrimination (Peticolas and Hauge 2006). Further erosion of the positive impact of Executive Order 12898 is exemplified by a recent report by the USEPA Office of Inspector General (US EPA 2006c) that EPA senior management had not sufficiently directed program and regional offices to conduct EJ reviews in accordance with Executive Order 12898 (US EPA 2006c).

The political climate and lack of leadership on fulfilling the mandate of Executive Order 12898 has set a bad precedent for environmental justice in states without an extensive network of grassroots EJ organizations. In the state of Alabama, the Alabama Department of Environmental Management (ADEM) has made slow progress in establishing a strong environmental justice unit to address environmental justice issues in communities of color and poor neighborhoods including PCB levels in West Anniston, Alabama and air quality issues in urban areas of Birmingham (Walton 2005, Bouma 2004, 2005, 2006a, 2006b, 2006c). While in North Carolina, the North Carolina Environmental Justice Network (NCEJN) has had success with its EJ agenda. One recent example is a new statewide moratorium on landfills supported by the governor and the legislature (News & Record 2006; Schreiner 2006; Robertson 2006) which follows up a statewide moratorium on industrial hog farms (Poyner & Spruill 2001; Associated Press 2003) and legislative discussions on phasing out hog lagoons (McGrath 2006). These issues have been two major

grassroots efforts of the NCEJN (NCEJN 2006).

Steps have also been taken to bolster EJ-related policy by the legislative branch due to the ineffective enforcement of EJ policies by the EPA. Congresswoman Donna Christensen introduced the “Health Equity and Justice Act of 2006” to improve the health of minority individuals, increase environmental justice accountability and evaluation, emphasize ameliorating disproportionate burden of environmental hazards on low income neighborhoods, people of color, and Native American populations, and develop new EJ strategies (H.R. 6275). Senator Robert Menendez introduced Senate Bill 4009 known as the “Environmental Justice Enforcement Act of 2006,” which seeks to “restore, reaffirm, and reconcile legal rights and remedies under civil rights statute” (S. 4009) which were decreased by the Supreme Court’s decision in *Alexander v. Sandoval*, 532 U.S. 275 (2001). This decision eroded Title VI of the Civil Rights Act and efficacy of Clinton’s EJ Order by raising “the bar for private parties seeking to bring civil rights litigation against government by requiring plaintiffs to demonstrate an agency decision intentionally discriminated against minorities” (2001). These two efforts are important in reaffirming the federal commitment to providing environmental justice to all US citizens and attempt to reconnect environmental justice to its civil rights and social justice roots.

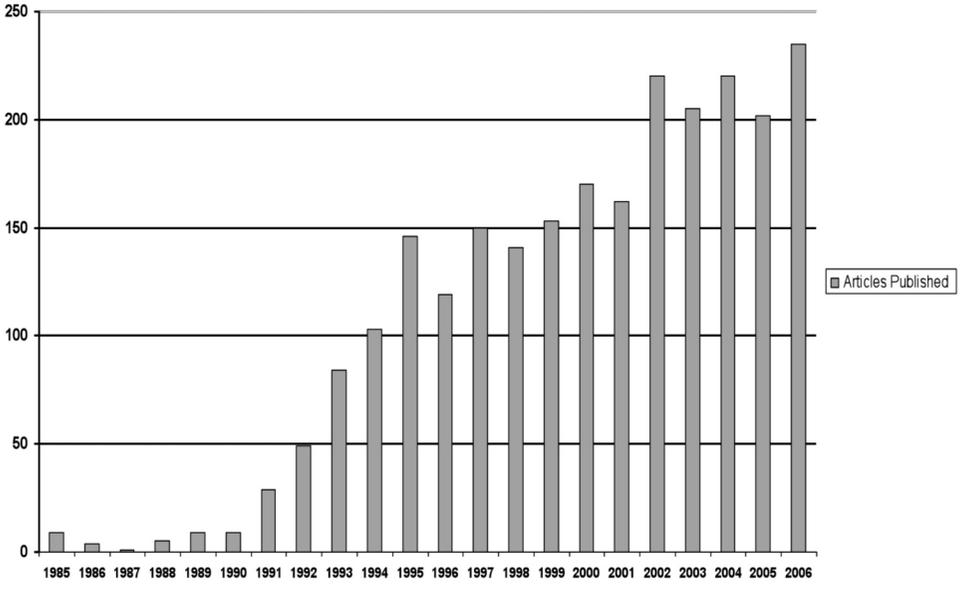
### **Environmental Justice in Academia**

Environmental justice science has evolved over the last two decades to help support the EJ movement beginning with landmark studies such as *Toxics Wastes and Race in America* (1987) and followed up with a significant body of literature that has examined the burden of environmental hazards on marginalized and disenfranchised racial/ethnic, low socioeconomic status, indigenous and immigrant populations (Morello-Frosch and Jesdale 2006; Payne-Sturges and Gee 2006; Payne-Sturges et al. 2006; Gee and Payne-Sturges 2004; Houston et al. 2004; Morello Frosch et al. 2000, 2001, 2002; IOM 1999; Sadd et al. 1999; Perlin et al. 1995, 1999, 2001; Ringquist 2005; Saha and Mohai 2005; Evans and Kantrowitz 2002; Wilson 2005; Wilson et al. 2002; Wing et al. 2002; O’Neill et al. 2003; Northridge and Shepard 1997; Szasz and Meuser 1997, 2000; Brown 1995; Bullard 1993, 1994a, 1994b, 2005; Bullard and Johnson 2002; Bryant and Mohai 1992; Pulido 1996a, 1996b; Bryant 1995).

To assess the contribution of academia to the environmental justice movement, I performed a search of scientific publications to calculate the number of EJ-related articles published per year from 1985 to 2006. I searched for the following terms in the title, abstract, body, and keywords of published articles: *environmental justice*, *environmental injustice*, *environmental inequality*, *environmental racism*, *environmental classism*, and *environmental inequity* in PubMed, BIOSYS Ovid, ProQuest, multiple MEDLINE databases, and multiple Web of Science databases. I tried to perform a more exhaustive search using Social Science Abstracts (EBSCO) and other Social Science databases, but these databases were unavailable at the time of this search.

Figure 1 shows a non-linear increase in the number of articles published from 1985 to 2006. During the late 1980s, less than 25 articles were published. We observed a significant increase in the number of research articles published on environmental justice topics starting in 1992. In 1992, 50 articles were published on EJ topics with a two fold increase

**Figure 1. Number of articles published on environmental justice topics from 1985-2006**



in 1995, and an additional increase in the number of articles above the 150 mark in 2000. The increase in the number of published articles during the 1985 to 2006 time period may be attributed to significant events in the environmental justice timeline. For example, the increase in 1991 may partially be attributed to the impact of the First People of Color Environmental Justice Summit held in Washington, DC. We may also attribute other increases in scientific publications to the impact of the newly-established EPA Office of Environmental Justice in 1992, forming of the National Environmental Justice Advisory Council (NEJAC), and the Presidential Executive Order on Environmental Justice (Clinton 1994). The Institute of Medicine’s report on environmental justice published in 1999 (IOM 1999) was another milestone study similar to *Toxic Waste and Race in America* by catalyzing research that examined the impact of environmental justice in increasing public health risks of disparately burdened low income and racial/ethnic populations. Additional increases can be attributed to establishment of federal funding including the EPA’s Environmental Justice Small Grants Program and the National Institute of Environmental Health Sciences (NIEHS) Environmental Justice: Partnerships for Communication Grant Program under the leadership of Dr. Kenneth Olden, former NIEHS director.

Academic EJ research has detailed the stories of communities fighting against the impacts of landfills, incinerators, chemical plants, and other pollution-intensive industries and land uses in vulnerable communities (Bullard 1993, 1994a, 1994b, 2005; Bullard and Johnson 2000; Bryant 1995; Bryant and Mohai 1992; Westra and Wenz 1995). Academic researchers have made some positive contributions to the development of EJ science (Pellow

and Brulle 2005; Pellow 2000; Pulido 2000; Taylor 2000; Cutter 1995; Bullard 1994a, 1994b; Bryant and Mohai 1992; Szasz and Meuser 1997; Sexton 2000; Capek 1993) and the progress made by EJ advocates to improve environmental conditions and public health in affected communities.

***Advancements made in Environmental Justice Science and Research.*** Environmental justice scientists have been instrumental in developing techniques to assess the burden of pollution on populations at the local and regional levels such as the development and application of spatial methods including geographic information systems (GIS) (Wilson 2005; Maantay 2002, 2005, 2007; Mennis 2002; Sheppard et al. 1999; McMaster et al. 1997; Liu 2000; Dolinoy and Miranda 2004; Jerrett et al. 2001, 2003) and distance-based methods (Maantay 2007; Mohai and Saha 2006; Chakraborty and Armstrong 1997; Glickman et al. 1995, Hamilton and Viscusi 1999). These methods have been helpful documenting the distribution of environmental hazards and unhealthy land uses in highly burdened communities and across different spatial scales. Other researchers have debated the use and standardization of environmental justice (Phillips and Sexton 1999; Holifield 2000; Harvey 1996; Perhac 1999) and environmental racism (Boerner and Lambert 1995; Pulido 2000, 1996a; Holifield 2000; Bullard 1994a) to improve the effectiveness of researchers and activists in using research, political mobilization and grassroots empowerment to improve environmental health in EJ communities.

Some researchers have pushed the field of environmental justice science forward to make the EJ framework more effectively address public health issues. Brulle and Pellow (2006) introduced environmental inequality terminology to link unequal environmental exposures to public health outcomes and contribution of these exposures to health disparities in the US. Gee and Payne-Sturges (2004) developed an innovative environmental health disparities framework to assess how environmental exposures and psychosocial stress interact to increase the vulnerability of racial/ethnic populations to adverse health outcomes and drive health disparities. Morello-Frosch and Lopez (2006) constructed a framework that examines the relationship between racial segregation and environmental health disparities in EJ communities. This framework provides an opportunity to look at racial/ethnic health disparities in disadvantaged EJ communities through the lens of racial segregation (Morello-Frosch and Lopez 2006).

Academic scientists have made important contributions to the EJ movement, but more work is needed to capture the experiences of affected populations at the grassroots level. In the following sections, I will discuss environmental slavery as a new conceptualization that connects environmental justice to sociohistorical conditions, community development and planning, and public health in the tradition of community-based EJ activists. In addition, I will discuss evidence that supports the concept of environmental slavery and examples of environmental slavery at the community level. I will also describe how the environmental slavery concept can be integrated into research, management and policy.

### **Introduction of Environmental Slavery**

***Limitations of Environmental Racism and Classism.*** Environmental racism and environmental classism have been beneficial in achieving EJ objectives in some cases; however,

these concepts are not holistic enough to help describe or understand the constellation of processes and conditions which construct social spaces where multiple environmental risks accumulate in EJ communities. These concepts are somewhat instructive in providing insight into how structural racism, privilege of affluent and white populations, and institutional discrimination in environmental policies, capitalistic processes, industrialization, human relations, and community planning and development have led to the construction of social spaces where certain communities are overburdened by pollution and environmental hazards and underserved by health promoting infrastructure. It is important to understand the linkages between the production of “risksapes” (Morello-Frosch et al. 2001; Morello-Frosch and Lopez 2006) or geographic sacrifice zones (Bullard 1994a, 1994b) and historical racism and class politics, particularly the important linkages between structural racism, economic inequalities, and power dynamics in the US using a more historically and spatially grounded framework focused on human rights, justice and health.

***Historic Pattern of Exploitation, Commodification, and Devaluation.*** The concepts of environmental racism and classism provide a first step to understand how disadvantaged communities in the US hegemony have been relegated to marginalized rural and urban spaces. These concepts do not completely speak to the strong historical pattern of the American economic machine to commodify or decommodify certain people because of their race, ethnicity, nativity, or culture. This economization of different peoples in this country has a long history beginning with the commodification of African peoples during slavery and devaluation of African peoples post slavery, Jim Crow, and today. This pattern has also been seen in the destruction of Native American autonomy during Western expansion and resettlement of the lands that have been commodified (i.e., mining rights on Native lands given to US mining companies) while the people on the lands have been devalued as seen by their exposure to pollution from power plants, mine waste, and radiation (LaDuke 1999) and the inadequate level of health services made available by the US government on the reservations (Bullard 1994a). The reservation system has bounded Native groups into geographically and politically isolated spaces overburdened by environmental hazards and risky health behaviors including high alcoholism and tobacco consumption that result from the intergenerational effects of the dehumanization/devaluation process. Currently, this form of commodification can be seen with Mexican illegal immigrants who work in dangerous construction or factory jobs or are exposed to multiple chemical toxins and unsanitary conditions on agricultural operations (Pena 2005; Pulido 1996b). The shared experience of populations with different racial/ethnic group memberships, cultural backgrounds and social values than the dominant group has been one of exploitation, commodification, and devaluation.

***Environmental Slavery Conceptualization.*** To represent this history and the current day operationalization of structural racism, classism, privilege, and community devaluation embedded in economic and environmental policies, zoning, planning, and community development, I introduce the concept of environmental slavery. *Environmental slavery* (ES) is a concept rooted in critical social and race theory (Outlaw 2005; Crenshaw et al 1996) and political ecology (Swyngedouw and Heynen 2003; Morello-Frosch 2002). Environmental slavery is synonymous with environmental oppression. ES occurs when certain communities different from the dominant racial and class hegemony are used to host social and environ-

mental externalities, while the dominant racial and class hegemony benefits from the devaluation of these communities and the inequities in resource distribution that allow these dominant populations to increase their environmental amenities and economic and social capital, while there is a destabilization and underdevelopment in community growth, environmental and public health, and quality of life in communities impacted by environmental slavery.

We observe the impact of economic development, waste production, and land use footprints of dominant communities on communities oppressed through environmental slavery processes. The burden of these footprints on subordinated communities constrains the ability of these oppressed communities from enjoying ecological goods and services present in their own neighborhoods particularly in urban ecosystems. The burden of industrial zoning, environmental hazards, and pathogenic infrastructure decreases the health of urban ecosystems that constitute the lived space of oppressed populations. As a result, the ecological goods and services provided by urban ecosystems benefit dominant communities located in the suburban and exurban spaces that surround the urban center. In economic terms, dominant communities, the beneficiaries of the ecological goods and services of urban ecosystems, are not paying for the services provided by the use of environmental resources in subordinated communities overburdened by environmental and social externalities and pathogenic land uses.

Environmental slavery can be seen as the antithesis of environmental justice. This concept can be used by EJ advocates who reside in affected communities as an empowerment and political organization mechanism. It provides a point of awakening for these communities who have not received access to positive social, environmental, and economic alternatives to the hazards and unhealthy land uses present in their residential spaces. This is unlike dominant groups who have political and economic resources in abundance and control the intergenerational trajectories of segregated and subordinated communities through structural racism and privilege embedded in development and enforcement of planning and zoning standards and policies (Pulido 2000). Analogous to the intergenerational enslavement, oppression and disenfranchisement of African peoples, we may see fragmentation and devitalization of communities subordinated and oppressed through environmental slavery processes and the accumulation and leveraging of the intergenerational benefits of environmental slavery by communities or entities who directly or indirectly support it.

***Environmental Slavery and Privilege.*** The environmental slavery concept is also rooted in the EJ theory and science developed by Robert Bullard (Bullard and Johnson 2000; Bullard 1993, 1994a, 1994b, 2005) and Bunyan Bryant (Bryant 1995; Bryant and Mohai 1992) and reframed by Laura Pulido, an innovative urban geographer (Pulido 1996a, 1996b, 2000). Pulido contends that environmental justice research should examine how institutional racism and white privilege act together to shape places particularly urban environments and create environmental inequality (2000). *White privilege*, “a form of racism that both underlies and is distinct from institutional and overt racism,” “refers to the hegemonic structures, practices and ideologies that reproduce whites’ privileged status” (Pulido 2000, 15). White privilege is relational to other forms of racism that dominant our racism dialogue, benefits whites who accrue social benefits by maintaining the status quo, and “thrives in highly racialized societies” (Pulido 2000,15). White privilege is seen in economic, housing, educational and wealth-generation opportunities; political access; property values; and the ability to live

in neighborhoods free from environmental hazards and close to ample resources and infrastructure. White privilege has both “socio-spatial” and temporal components (Pulido 2000, 33). Our understanding of these components helps us to more effectively assess the impact of past and current racisms on the construction of our social spaces and urban landscapes and examine how race and racism have intergenerational impacts on white and non-white populations from an environmental justice standpoint (Pulido 2000).

Pulido’s analytical approach to examine environmental racism using the concept of white privilege provides a strong foundation for the environmental slavery conceptualization. The ES concept builds on the concept of white privilege to examine not only how intentional acts produce environmental racism and inequality (Pulido 2000), but to examine the contribution of urban development processes including white flight (suburbanization), white flight (urban revitalization), zoning, and planning to the production and cementation of environmental inequality in EJ communities.

### **Scientific Evidence for Environmental Slavery**

There is a wealth of environmental justice literature that provides evidence to support the environmental slavery concept. Gee and Payne-Sturges (2004) and Morello-Frosch and Lopez (2006) indicate the importance of segregation in driving exposure of disadvantaged urban populations to environmental risk factors (physical, social, economic) that lead to a disproportionate burden of environmental hazards and noxious land uses which impact urban health and health disparities. In urban areas, social, economic, and political forces combined with historical patterns of disinvestment, industrialization, zoning and planning (i.e., highway development and expansion) have segregated populations of color in impoverished communities with few resources and more environmental risks (Morello-Frosch and Lopez 2002). In these communities, few municipal services are available, there is a decline in urban infrastructure, and the physical environment has been eroded (Williams and Collins 2001).

Many urban populations of color live in communities differentially burdened by high levels of EPA criteria air pollutants (e.g., carbon monoxide, particulate matter, sulfur dioxide, nitrogen oxides) released from vehicle exhaust due to heavy traffic loads on highways that bisect or border their neighborhoods and factories located in industrial corridors spatially concomitant with urban neighborhoods (Payne-Sturges and Gee 2006; Houston et al. 2004). These host communities act as sinks for pollutants released from both vehicular and industrial sources. Exposure to these pollutants can lead to cancer or exacerbate negative respiratory health outcomes (e.g., asthma) (Morello-Frosch and Lopez 2006; Payne-Sturges and Gee 2006). For example, Morello-Frosch and Lopez (2006) used regression analysis to examine the relationship between average levels of criteria air pollutants and black-white residential segregation across Metropolitan Statistical Areas (MSAs). After controlling for several SES variables including percent Black, percent poverty, and per capita income, Black-White segregation was correlated with increased levels of sulfur dioxide, PM<sub>10</sub>, and ozone across metropolitan regions.

In addition, both Morello-Frosch and Jesdale (2006) and Lopez (2002) found that segregation is associated with greater exposure of populations of color to hazardous air pollutants (HAPs) and increased cancer risks even after controlling for MSA-level SES.

**Table 1. Criteria Air Pollution and White-Black Segregation**

Pollutant	Number of Metropolitan Areas	Coefficient	95% confidence interval
Carbon Monoxide	130	-0.019	(-0.0021,-0.036)*
Particulate Matter	201	0.006	(-0.054, 0.066)
Nitrogen Oxides	94	-0.00002101	(-0.0000093, 0.000051)
Sulfur Dioxide	135	0.0000471	(0.000014,0.000080)**
Ozone	197	0.000233	(0.000097,0.0037)**

\* Significant at the 0.05 level; \*\*Significant at 0.01 level

Source: Morello-Frosch and Lopez, 2006, Environmental Research 102: 181-196.

Morello-Frosch and Lopez (2006) indicates: 1) an increase in cancer risks across all metropolitan regions as segregation increases for all racial/ethnic groups and 2) Hispanics, Asians, and Blacks can have higher estimated cancer risks burdens associated with HAPs in metropolitan regions with higher segregation in comparison to all racial/ethnic groups and whites.

The *Toxic Wastes and Race at Twenty* report (Bullard et al. 2007) provides more evidence about the burden of environmental slavery on disadvantaged urban populations. The report reveals that people of color are approximately three times more likely to live in neighborhoods that host a commercial hazardous waste facility than whites, nationally. The study reports 83% of hazardous waste facilities (n=343) are located in metropolitan areas and the disparity in burden persists at this level. Table 2 shows racial and socioeconomic disparities between host and non-host neighborhoods at the metropolitan level using data from the 2000 Census. We find greater numbers of African-Americans, Hispanics, and Asians in host neighborhoods than non-host neighborhoods. Similarly, a greater proportion of economically disadvantaged populations host hazardous waste facilities than non-disadvantaged populations.

The evidence presented in *Toxic Wastes and Race* is similar to data presented in a large body of EJ literature that has documented the disparate distribution of environmental hazards and unhealthy land uses (e.g., hazardous waste sites, landfills, refineries, petrochemical plants, industrial facilities, publicly owned treatment works, heavily-trafficked roadways) across racial and class lines (Bryant and Mohai 1992; Gee and Payne-Sturges 2004, 2006; Pellow and Brulle 2005; Brulle and Pellow 2006; Mohai and Saha 2006; Morello-Frosch and Lopez 2006; Bullard 1994b, 2005, 2007; UCC, 1987; IOM 1999; Pulido 2000). These exposure disparities drive and maintain environmental slavery in disadvantaged communities and communities of color.

### **Evidence for Environmental Slavery at the Grassroots Level**

The primary evidence for the environmental slavery conceptualization comes from the author's experiences and work with community-based environmental justice organizations in North Carolina fighting for environmental justice. The author has been a member of the North Carolina Environmental Justice Network for ten years. The network is made of community-based environmental justice organizations such as the Concerned Citizens of Tillery, the West End Revitalization Association (WERA), and the Rogers Road Neighborhood Association (RENA). These groups and others are fighting against the disproportionate burden of: 1) landfills, industrial hog operations, sewage treatment plants, coal-fired plants, and other land uses;

**Table 2. Racial and socioeconomic disparities between host neighborhoods and non-host neighborhoods for commercial hazardous waste facilities in metropolitan areas**

Demographic Variable	Host Neighborhoods	Non-Host Neighborhoods
% People of Color	56.6%	33.1%
% Black	20.1%	12.8%
% Hispanic/Latino	27.4%	13.7%
% Asian/Pacific Islander	6.8%	4.4%
Poverty Rate	18.3%	11.6%
Mean Household Income	\$46,391	\$60,438
Mean Housing Value	\$136, 880	\$173,738

Source: *Toxic Wastes and Wastes at Twenty* Report, United Church of Christ, 2007.

2) inequities in planning, zoning, and development including transportation planning; and 3) the lack of basic amenities (e.g., sewer and water services, paved roads, sidewalks, stormwater management, good housing stock) in communities burdened by environmental slavery and related economic, environmental, and public health impacts.

**The Concerned Citizens of Tillery’s Fight against Industrial Hog Farms.** The Concerned Citizens of Tillery (CCT), a grassroots organization in southeast Halifax County, NC, founded in 1978 uses grassroots leadership and empowerment to promote the economic, social, educational, and environmental health of its community and other communities in state, nationally, and internationally ([www.cct78.org](http://www.cct78.org)). In the 1990s, the rapid industrialization of hog production in North Carolina became a problem for underprivileged, poor, and minority communities. After getting a livestock environmental ordinance passed in the county, CCT developed a research partnership with researchers at the University of North Carolina (UNC) School of Public Health and other partners to document the health and quality of life impacts of industrial hog production that disproportionately affects poor, elderly, and minority communities in the state (Wing 2002; Wing et al 2000). Wing et al (2000) found 19 times more hog operations in the highest quintile of poverty as compared to the lowest (7 times when adjusted for population density), six times the number of hog operations in the highest three quintiles of non-white population (9-100% African-American) which reduced to 5 times after adjustment for population density, and the highest number of hog operations in census block groups with both high poverty and non-white populations. These facilities release ammonia, hydrogen sulfide, volatile organic compounds (VOCs), other gases, chemicals, and microbes that impact environmental quality and human health. CCT has been working over ten years to pass a permanent moratorium on the permitting of new industrial hog facilities and the phasing out of hog farm lagoons, one of the primary sources of pollution on industrial hog operations.<sup>3</sup>

**Rogers Road Eubanks Neighborhood Association, Landfills, and Public Health.** In addition to industrial hog farms, landfills are a major priority for the North Carolina Envi-

<sup>3</sup> The Concerned Citizens of Tillery and the North Carolina Environmental Justice Network are led by Mr. Gary Grant who was been an important leader fighting against environmental slavery, oppression, racism, and injustice in North Carolina primarily on industrial hog farming, landfills, and Black farmers’ land loss.

ronmental Justice Network. Norton et al (2007) found that block groups in North Carolina with  $\geq 50\%$  people of color had 2.8 times odds of a having a solid waste facility compared with block groups with  $< 10\%$  people of color, and 1.5 times greater in block groups with median house values  $< \$60,000$  compared with block groups with median house values  $\geq \$100,000$ . Rogers Eubanks Neighborhood Association (RENA) has been at the forefront of this issue in North Carolina. RENA, an association representing historic post-slavery African-American neighborhoods, near Chapel Hill, North Carolina, was founded by Minister Robert Campbell and other neighborhood residents to stop the development of a waste transfer facility in their neighborhood. According to Minister Campbell, President of RENA (oral communication, July 2008), the residents did not agree with the siting of the local landfill near their neighborhood in 1972. At this time, the mayor of Chapel Hill promised that the landfill would be closed after ten years, after closure the landfill would be converted into a neighborhood park, any future landfills would be located somewhere else, and the area would not become a permanent dumping site for waste from local municipalities (Reverend Campbell, oral communication). With these promises, the residents reluctantly agreed to allow the siting of the landfill in their neighborhood.

In 1972, Chapel Hill, Carrboro, and Orange County, North Carolina bought land in the RENA communities and opened the Orange County Regional Landfill on the north side of Eubanks Road (Vallero and Vesilind 2006). In November 1987, a planning agreement was made between Orange County, Chapel Hill, and Carrboro allowing the Town of Chapel Hill to perform future development and planning activities within the RENA communities. Planning inequities allowed municipalities to site the landfill in 1972 and other future LULUs (i.e., construction and demolition landfill, recycling operation, solid waste transfer station) in the RENA communities without the meaningful participation of affected residents. Currently, RENA residents see the drive by local officials to cite a waste transfer facility in their neighborhoods as environmental racism and believe the new facility will exacerbate environmental and public health problems that already exist in the area.

RENA residents are currently exposed to malodorous compounds and air pollutants emitted from the landfill, noise pollution and negative quality of life impacts from the waste truck; high levels of animal and insect vectors (e.g., rats, flies, feral cats and dogs, mosquitoes, buzzards); and ground water contamination. The North Carolina Division of Water Quality (NCDWQ) documented groundwater contamination from test wells surrounding the Orange County landfill. This is a major concern for residents because they rely on wells as their primary source of drinking water. Residents are unable to drink their well water because of landfill contamination.

In addition to exposure to landfill-related hazards, the residents are underserved by basic amenities. RENA<sup>4</sup> residents have documented that they do not have: 1) public, regu-

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<sup>4</sup> The experience of RENA residents has been a primary example of environmental slavery. These residents who are primarily African-American have been burdened by the landfill for over thirty years without any community benefits. A large amount of this waste has been contributed by local universities. RENA recently submitted a civil rights complaint to the Department of Justice and the Environmental Protection Agency because of the disproportionate burden of the landfill on the local community, planning inequities, and the lack of basic amenities.

lated drinking water service, 2) public, regulated sewer service, 3) paved roads and streets, 4) stormwater drains, 5) street curbs and gutters, 6) street lights, and 7) sidewalks. Town officials promised that access to the above amenities would be part of the compensation package for the neighborhoods hosting the landfill. Additionally, promises were made to provide adequate law enforcement and fire and emergency services. As RENA residents currently face the siting of Orange County's new solid waste regional transfer station in their backyard, none of the promises of basic amenities have been kept (Vallero and Vesilind 2006).

***The West End Revitalization's Association Struggle for Basic Amenities.*** The West End Revitalization Association (WERA) was founded in 1994 in Mebane, North Carolina, as a community development corporation (CDC) to address the disproportionate impact of the 119 bypass on WERA communities which have been disparately burdened by built environment insults, inequities in zoning, and underdeveloped due to institutional racism and discrimination (Wilson SM et al. 2008a,b; Wilson OR et al. 2008). WERA filed complaints under Title VI of the Civil Rights Act of 1964 and the Executive Order on Environmental Justice (Clinton 1994) at the US Department of Justice in 1999 (Wilson SM et al. 2008a,b; Wilson OR et al. 2008; Heaney et al. 2007), regarding plans for the 119-bypass/interstate that would destroy two WERA neighborhoods (West End and White Level).

These complaints highlighted the disregard for compliance with public participation laws by local, state, and federal entities, institutional and environmental racism and potential adverse and disproportionate impact and burden of the bypass on low-income and African-American neighborhoods in Mebane (Wilson SM et al. 2008a,b; Wilson OR et al. 2008; Wilson SM et al. 2007; Heaney et al. 2007). The complaints also highlighted the lack of basic amenities as a built environment environmental justice issue (BEEJI) (Wilson SM et al. 2008a,b; Wilson OR et al. 2008; Wilson SM et al. 2007). WERA's complaint on basic amenities was the first EJ complaint presented to the EPA's Office of Environmental Justice on the topic (Wilson SM et al. 2008a). WERA's complaint has helped expand the coverage of the environmental justice movement from traditional EJ issues such as LULUs and Put in Blacks' Backyards (P.I.B.B.Y.) to issues regarding physical and public health infrastructure of disparately burdened EJ communities (Wilson SM et al. 2008b).

WERA<sup>5</sup> has evolved into a community-based environmental protection organization (CBEPO) to address EJ issues beyond the 119 bypass and lack of basic amenities including: 1) surface water and drinking water contamination; 2) lack of proper ingress and egress of neighborhood roads; 3) unpaved roads and dead-end streets; 4) substandard and dilapi-

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<sup>5</sup> WERA's work in Mebane, NC, presents the strongest case that supports the validity of the environmental slavery concept. To address environmental justice in their community, WERA used community-driven grassroots research and leadership and developed several collaborative partnerships with academics, public health officials, lawyers, and planners. WERA's research efforts have led to many WERA residents receiving first time installation of sewer and water services and paving of roads. There is a wealth of literature including case studies available on WERA's efforts including fighting ETJ statutes in (Wilson SM et al 2008a,b; Heaney et al 2007; Wilson OR et al 2008; Wilson SM et al 2007). WERA was recognized for its successful EJ efforts by receiving an EPA Environmental Justice Award. Omega Wilson, WERA's President, is a member of the EPA's National Environmental Justice Advisory Council working on infrastructure, basic amenities, and health related policies.

dated housing; 5) leaky underground storage tanks; 6) noxious land uses; 7) exclusion from land-use planning and community development; 8) redlining through extraterritorial jurisdiction (ETJ) statutes; and 9) non-compliance with EPA environmental laws including the Clean Water Act, Safe Drinking Water Act, Toxic Substances and Control Act, and Solid Waste Disposal Act (Wilson SM et al. 2008a,b; Wilson OR et al. 2008; Wilson SM et al. 2007; Heaney et al. 2007). WERA's holistic conceptualization of environmental justice provides insight into how communities can use the environmental slavery concept to more effectively address environmental health disparities. WERA's struggle epitomizes the intergenerational context of many urban and rural populations overburdened by environmental pollution and underserved by health promoting infrastructure in politically, geographically, economically, and racially bounded communities across the US.

### **Environmental Slavery, Public Health, and Health Disparities**

The environmental slavery concept is an important evolution of environmental justice theory and science which helps to reframe public health issues in environmental justice communities. This new EJ concept extends the concepts of environmental racism and classism to cover sociohistorical, economic, and ecological processes related to land use planning and community development and environmental policies that lead to the disproportionate burden of environmental pathogens (i.e., environmental hazards and unhealthy land uses), social pathogens (i.e., racism, poverty, crime, violence, drug environs) and inadequate access to health-promoting infrastructure known as "ecologic salutogens" (Gee and Payne-Sturges 2004) (i.e., equitable transportation infrastructure, schools, medical facilities, supermarkets, greenways, sewer and water infrastructure, parks, good housing stock, grocery stores, community gardens, farmers' markets) in EJ communities. The combination of disparate number of environmental hazards and lack of infrastructure to buffer EJ communities against their exposure to hazards and negative land uses produces high risk settings (Williams 1999) known as "riskscapes" (Morello-Frosch et al. 2001; Morello-Frosch and Lopez 2006) or "geographic sacrifice zones" (Bullard 1994a, 1994b). In some cases, these "riskscapes" (Morello-Frosch et al. 2001; Morello-Frosch and Lopez 2006) have become pervasive in the inner core and peripheries of towns and cities.

This spatial arrangement of "riskscapes" creates a geography of unhealthy community ecosystems (UCEs). Populations who reside in these UCEs may have adverse health outcomes ranging from obesity, asthma, diabetes, cardiovascular disease, cancer to mental health disorders. As result, it is possible that a large portion of health disparities in this country are driven by environmental injustice in the form of environmental slavery: 1) the disproportionate burden of unwanted land uses on subordinated and segregated communities and populations, 2) inadequacies of the built environment, 3) exposure to social and environmental pathogens, and 4) limited access to "ecologic salutogens." Conversely, dominant groups due to privilege and direct or indirect benefits from environmental slavery have less exposure to unhealthy land uses, higher quality built environment conditions and infrastructure, lower exposure to social pathogens, and access to more and higher quality salutogens than subordinated EJ communities.

The current discourse in environmental justice research and advocacy that focuses on

the siting of pollution-intensive industries and environmental hazards in poor, non-white, indigenous, and other vulnerable communities is not sufficiently advancing public health research or creating evidence-based interventions and policies to effectively address health disparities in UCEs. The development of innovative environmental justice and health frameworks (Pellow 2000; Brulle and Pellow 2006; Morello-Frosch and Lopez 2006; Gee and Payne-Sturges 2004; Payne-Sturges et al. 2006; Soobader et al. 2006) are providing guidance in how we should examine the cumulative burden of health risks in economically and racially segregated EJ communities. This new body of work is also providing direction in evaluating the historical processes (Pellow 2000; Brulle and Pellow 2006; Morello-Frosch and Lopez 2006; Gee and Payne-Sturges 2004) that lead to the development of these risks, important drivers of health disparities in this country. The ES concept will help supplement this emerging body of environmental justice research that focuses on public health and health disparities. The addition of environmental slavery to the EJ framework increases the capacity of researchers, public health advocates, and EJ activists to address the intersectionality of environmental (physical and structural), geographic and social determinants of health in environmental justice communities across race, ethnicity, SES, nativity and gender by developing culturally appropriate and locally relevant interventions and policies informed by the application of the EJ framework.

This new EJ approach provides an opportunity to alter how we examine environmental health disparities between disadvantaged and advantaged groups across different geographic spaces and temporal periods. We focus on the health deficits of populations at the bottom of the health ladder, but we do not invest resources to really explore the impacts of health disparities on those populations at the top of the health ladder. It is critical that more energy is invested to elucidate the health benefits of environmental slavery accrued by dominant populations and communities to better illuminate the health status of subordinate populations. The ES conceptualization allows us to change the public health debate to bring accountability to groups who receive intergenerational health benefits from environmental injustice and health disparities. These groups should share the responsibility of dismantling environmental slavery specifically two components (structural racism and privilege) that create the conditions that shape our lived spaces (Pulido 2000) and help fuel and maintain health disparities in these spaces.

### **Research, Policy, and Management Recommendations to Address Environmental Slavery**

***Community-Driven Research Approach.*** Community-based organizations have pushed universities to make the research process more participatory and equitable which led to the development of the community-based participatory research (CBPR) approach (Israel et al. 1998, 2005a, 2005b; Minkler 2004, 2005; Minkler and Wallerstein 2003; Wing 2002). EJ organizations have engaged in CBPR as a more productive way to address local environmental justice and health issues (Vasquez et al. 2006; Srinivasan and Collman 2005; Northridge et al. 2005; Israel et al. 2005b; Policylink 2002; O'Fallon and Deary 2000, 2002; Shepard et al. 2002; Wing 2002, 2005; NIEHS 1999; Corburn 2002, 2005; Wing et al. 1996, 2002). Using this framework, community experts have been empowered to de-

velop the research questions, collect the data using their local expertise, ensure that the research is mutually beneficial, and that the end products of the research are locally relevant and culturally appropriate interventions, policies, and solutions (Israel et al. 1996, 2005a, 2005b; Minkler 2004, 2005; Minkler and Wallerstein 2003; Wing 2002).

The Environmental Protection Agency has played a significant role in providing research funds through its Environmental Justice Small Grant program that began by providing only \$15,000 (USEPA 2003) to community organizations, gradually increasing the grants to \$50,000 in 2006 (USEPA 2006d). This program was designed to support and help communities build capacity to address their local environmental and public health issues. Organizations were able to have some small successes with the funding, but additional funding infrastructure was added to further empower EJ communities. For example, the Environmental Justice Collaborative Problem-Solving Cooperative Agreements Program (EJ CPS) was established in 2003 by the EPA's Office of Environmental Justice (USEPA 2004) to fulfill this new objective. This program provides community organizations up to \$100,000 for three years to work with stakeholders across multiple sectors to employ research, resource leveraging and mobilization, conflict resolution and other techniques to address local EJ issues (USEPA 2004).

Community organizations have been enabled by the EJ CPS program to use empowerment science and perform applied, action-oriented environmental justice research to solve their EJ problems. For example, the West End Revitalization Association has utilized EJ funding from the EPA to develop its community-owned and managed research approach (COMR) and collaborative-problem solving partnerships to make progress toward addressing environmental slavery and obtaining basic amenities. The adoption of COMR principles and methods (Heaney et al. 2007; Wilson SM et al. 2007; Wilson OR et al. 2008) by other EJ organizations and use of collaborative problem-solving principles in partnerships with local planners, environmental managers, policymakers, industry, commerce departments, housing officials, revitalization experts, and other stakeholders may help these organizations also address environmental slavery and health disparities in their communities.

***Policy and Management Actions and Recommendations.*** At multiple levels of government, efforts must be taken by policymakers to ensure that environmental justice is integrated into all policies, initiatives, and programs. At the federal level, a recent bill entitled the Environmental Justice Act of 2007 should be approved to codify the Environmental Justice Executive Order 12898. The Executive Order has no legal authority to force compliance and enforcement of environmental justice objectives at the federal level, ensure that discriminatory decisions of federal agencies are addressed, and provide clear leadership to states and cities on the integration of environmental justice into all policies, development and planning initiatives, and public health programs (Bullard et al. 2007). A 2004 study by the American Bar Association surveyed on environmental justice legislation, policies, and initiatives at the state level found that very few states besides California had substantive EJ legislation. Many states had an environmental justice office in name only and some states had no environmental justice programs (ABA 2004). A national environmental justice law that codifies the Environmental Justice Executive Order and provides a fix for Title VI of the Civil Rights Act of 1964 that was weakened by the 2001 *Alexander v. Sandoval* case (Bullard et al. 2007) will provide much needed guidance to federal agencies and state and local governments.

Currently, the EPA has not fully implemented environmental justice throughout all of its divisions and programs as indicated previously. The EPA houses the Office of Environmental Justice (OEJ) and the National Environmental Justice Advisory Council (NEJAC), two leading authorities on EJ enforcement and compliance and guidance and policy recommendations, respectively. The fact that the EPA has not fully integrated environmental justice limits the utility of OEJ and NEJAC in addressing environmental injustice and slavery issues and sets a bad example for other federal agencies such as the Department of Energy, United States Department of Agriculture, Housing and Urban Development, Department of Labor, Federal Emergency Management Agency (FEMA), and other federal entities whose actions have implications for EJ communities but have not integrated environmental justice into all of their programs as mandated by the Environmental Justice Executive Order. If federal agencies have not integrated environmental justice into all of their actions, than states and cities cannot be expected to follow suit.

Many urban communities impacted by environmental slavery, injustice, and health disparities are undergoing change due to the efforts of policymakers, planners, and land use management authorities to revitalize cities populated with riskscape using smart growth efforts. Smart growth is a planning framework that focuses on the development of human landscapes that are characterized by denser development, conservation of green space, and mixed land use to make communities walkable, livable, and sustainable (Wilson, Hutson, and Mujahid 2008). In some cases, this revitalization does have its core the principles of social equity and justice and is leading to fragmentation, gentrification, and more environmental injustice (Wilson, Hutson, and Mujahid 2008). In communities impacted by environmental slavery, smart growth can be beneficial particularly if innovative policies and management approaches are used. Policymakers and environmental managers should bring green planning and zoning initiatives to environmental justice communities. There are many examples of green zoning and planning initiatives in places like Boulder, Chicago, Portland, Philadelphia and Seattle to name a few. More of these programs should be placed in environmental justice communities and not just in affluent, trendy, and privileged communities and neighborhoods. The greening process should go beyond buildings and include open space, public transit, and the support of urban agriculture and farmers' markets, and green jobs in the energy and construction sectors.

In addition, policymakers, planners, and environmental managers should work with communities burdened by environmental slavery to perform holistic community development. For example, community-based planning initiatives may be beneficial to environmental justice communities burdened by environmental hazards, noxious land uses, and limited health promoting infrastructure such as basic amenities. These initiatives could include collaborative partnerships between impacted community stakeholders, policymakers, and managers to create healthy living zones which would be free of pollution-intensive facilities, environmental hazards, and pathogenic infrastructure such as pawn shops, liquor stores, and fast food restaurants. Local policymakers and managers could upgrade their local zoning ordinances to do this or expand the use of conditional use permits (CUPs) to control environmental pathogens as the foundation for local "healthy zoning" initiatives (Wilson, Hutson, Mujahid 2008).

Another approach would be to follow the model of economic development zones by providing opportunities for communities impacted by environmental slavery to create healthy community zones that place limits on the number of noxious land uses and pathogenic, health-restricting facilities (Wilson, Hutson, Mujahid 2008). Recently, a bill entitled “Healthy Communities Act of 2007” (<http://www.opencongress.org/bill/110-s1068/text>) introduced a similar concept to healthy community zones called health action zones. This bill seeks to improve environmental health in communities across the country. It includes requirements for environmental health report cards and opportunities for communities with high levels of environmental pollution, environmental injustice, and environmental health disparities to receive funding to development health action zones in order to improve health and quality of life in their communities. State and local policymakers could pass acts or ordinances similar to the “Healthy Communities Act of 2007” in order to eliminate environmental injustice and improve health.

Furthermore, states and counties could help EJ communities establish community land trusts or land banks by passing legislation similar to the Land Bank legislation that passed in the State of Michigan in 1999. This legislation led to the establishment of the Genesee County Land Bank (GCLB) in 2002 to stabilize neighborhoods and revitalize the City of Flint and surrounding areas (GCLB 2009). The GCLB is working to improve environmental, economic, and social health of Flint by encouraging the reuse of over 4,000 residential, commercial and industrial properties that it has acquired through the tax foreclosure process (GCLB 2009). The GCLB has ten programs to help stabilize and revitalize Flint neighborhoods including housing renovation, greening and beautification, development, foreclosure prevention, and brownfield redevelopment (GCLB 2009).

Policymakers and managers could develop Environmental Preservation Districts (EPDs) at the local and regional levels (Collins and Collins 2002). These districts are similar to community land trusts/banks but are modeled on historic districts created through the Federal Historic Preservation Act (Wilson, Hutson, and Mujahid 2008). These districts may empower communities to have more control of land use, development and planning initiatives. For example, communities with a history of environmental justice can request that more efforts be taken by environmental management, developers, and planners to assess the impact of new facilities and land uses in their communities. Currently, the National Environmental Protection Act requires entities to perform environmental impacts statements (EIS), but there are no substantive environmental justice or health assessment requirements for EISs. In EPDs, EJ communities could require that developers perform a health impact assessment (HIA) instead of the weaker EIS.

Also, when there are multiple environmental hazards or noxious land uses in EPDs, communities could request that federal, state, and and/or local agencies perform a cumulative risk assessment (CRA). CRAs consist of “assessing the multiple, cumulative, and synergistic exposures, unique exposure pathways and impacts to sensitive populations” to understand the level of environmental burden and health disparities in the EPD and non-compliance with environmental laws including the Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), Toxic Substances Control Act (TOSCA), and other federal regulations and public health statutes (Bullard et al. 2007). CRAs also can be

very useful in cases when there are no environmental laws or public health statutes to protect community health to provide both a baseline assessment and a standard for promulgating a new law by policymakers. The CRA would be required before the permitting of new facilities and cleanup and reuse of brownfields and other sites. The CRA would have utility in helping EJ communities establish buffers from polluting facilities and noxious land uses and new fee systems to address exposure disparities caused by these facilities or land uses such as a consumption fee for waste-producing counties and a carbon tax for polluting facilities, neighborhoods, and counties (Bullard et al. 2007).

Finally, policymakers and managers could work with impacted EJ communities, businesses, and industry to develop Community Benefits/Mitigation Plans. Since, EJ communities are hosting various types of unhealthy land uses and hazards which impact their health, quality of life, and sustainability they should receive benefits for hosting these facilities which will help address environmental oppression and slavery including financial resources and basic amenities. For example, North Charleston, South Carolina, has a number of hazards and noxious land uses, and high pollution levels due to the activities of the Port of Charleston. Many poor neighborhoods of color are negatively impacted by these activities. The Low Country Alliance for Model Communities (LAMC) which represents many of these EJ neighborhoods created a community mitigation plan (CMP) in partnership with the City of North Charleston and the South Carolina State Ports Authority (SCSPA) to address impacts of the Port of Charleston expansion on at-risk environmental justice communities in North Charleston. The Port, The City and LAMC agreed to work cooperatively on a community mitigation plan to maximize community benefits and minimize undesirable impacts from the project. This was one of the first port expansion projects in the country that focused on community efforts as part of the formal mitigation process. Community priorities that will be funded through this partnership include: 1) creation of an affordable housing trust; 2) enhanced community and health facilities; 3) environmental monitoring; 4) scholarships and other support for education; 5) small business development and assistance; and 6) development of a community redevelopment plan.

## **Conclusions**

The environmental justice movement has been important in raising national awareness about the environmental and public health issues that plague communities of color, poor neighborhoods, and other marginalized and oppressed populations. The EJ movement has been driven not only by community and social activism but by a new form of science based primarily in a critical experience framework. The bulk of academic EJ research that discusses the use of rigorous scientific methodologies to measure environmental inequities and examine the spatiotemporal distribution of environmental hazards and unhealthy land uses in and across different racial/ethnic and socioeconomic populations has had some benefits for EJ communities. However, the decontextualization of the lived experiences of residents who live in EJ communities has made the science fall short of the goals of eliminating disparities in environmental exposure and achieving social justice.

The introduction of the environmental slavery concept provides a new empowerment, mobilization, and research concept that EJ activists and their research partners can use

to address environmental justice problems. This concept strengthens the EJ framework by focusing on the sociohistorical construction of our lived spaces and how environmental discrimination and privilege embodied in our zoning, planning, and development policies create environmental injustice, unhealthy oppressed communities, and environmental health disparities. A community-driven EJ research agenda that uses the environmental slavery lens should focus on interventions that increase the number, quality, and access to ecologic salutogens in EJ communities and the elimination of ecologic pathogens as a way to reduce environmental health disparities. In addition, this applied research agenda should include management and policy interventions related to planning and zoning such as community land trusts, health impact assessments, historic preservation zoning, “green zoning,” “healthy zoning,” and other initiatives to improve public health, break the cycle of environmental oppression, and achieve justice for affected communities.

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