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Environmental Justice

Paul Mohai,[1] David Pellow,[2] and J. Timmons Roberts[3]

[1]School of Natural Resources and Environment, University of Michigan, Ann Arbor, Michigan 48109; email: pmohai@umich.edu

[2]Department of Sociology, University of Minnesota, Minneapolis, Minnesota 55455; email: dpellow@umn.edu

[3]Center for Environmental Studies, Brown University, Providence, Rhode Island 02912; email: timmons@brown.edu

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disproportionate impact, exposure, inequality, mobilization, pollution, race

Abstract

The article reviews two decades of scholars' claims that exposures to pollution and other environmental risks are unequally distributed by race and class, examines case studies of environmental justice social movements and the history and politics of environmental justice policy making in the United States, and describes the emerging issue of global climate justice. The authors engage the contentious literature on how to quantitatively measure and document environmental injustice, especially the complex problems of having data of very different types and areas (such as zip codes, census tracts, or concentric circles) around polluting facilities or exposed populations. Also considered is the value of perspectives from critical race theory and ethnic studies for making sense of these social phenomena. The article concludes with a discussion of the globalization of the environmental justice movement, discourse, and issues, as well as with some policy implications of finding and understanding environmental justice. One unique feature of this review is its breadth and diversity, given the different approaches taken by the three coauthors.

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1. INTRODUCTION

To understand why environmental justice matters, one need only remember that the movement fighting environmental racism is the result of what happens when people fear that their lives and health are being disproportionately put at risk because of the color of their skin or the sound of their accent. Environmental racism burst onto the national political and academic radar in 1982 when civil rights activists organized to stop the state of North Carolina from dumping 120 million pounds of soil contaminated with polychlorinated biphenyls (PCBs) in the county with the highest proportion of African Americans. Warren County became a symbol of the birth of a new social movement and of an issue that mainstream middle-class white environmentalists had failed to consider, i.e., that people of color and poor communities were facing ecological risks far greater than they.

Soon afterward, environmental justice studies emerged as an interdisciplinary body of literature, in which researchers were documenting the unequal impacts of environmental pollution on different social classes and racial/ethnic groups. Today, hundreds of studies conclude that, in general, ethnic minorities, indigenous persons, people of color, and low-income communities confront a higher burden of environmental exposure from air, water, and soil pollution from industrialization, militarization, and consumer practices. Known variously as environmental racism, environmental inequality, or environmental injustice, this phenomenon has also captured the attention of policy makers.

Thus, a substantial body of literature that documents the existence of environmental inequalities in the United States emerged (1–3). Early findings were later amplified by a series of studies focusing on the location of hazardous waste sites, beginning with a study conducted by the U.S. General Accounting Office (GAO) (4) in 1983. This study documented that African American communities in the southern United States were playing host to a disproportionately high number of waste sites (4). That regional study was followed in 1987 by the United Church of Christ (UCC) Commission for Racial Justice's groundbreaking national study titled *Toxic Wastes and Race in the United States* (5), which documented the unequal and discriminatory siting of toxic waste facilities across the United States. The UCC study concluded that race was the most important factor in predicting where these waste sites would be located.

Benjamin Chavis, then executive director of the Commission for Racial Justice of the United Church of Christ, first coined and defined the term environmental racism in 1982 in the following manner: "Environmental racism is racial discrimination in environmental policy making, the enforcement of regulations and laws,

GAO: U.S. General Accounting Office (now, the U.S. General Accountability Office)

UCC: United Church of Christ

the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the life-threatening presence of poisons and pollutants in our communities, and the history of excluding people of color from leadership of the ecology movements" (6). Thus, environmental racism "refers to any policy, practice, or directive that differentially affects or disadvantages (whether intended or unintended) individuals, groups, or communities based on race or color" (7).

Turning the issue on its head to define the remedy for environmental racism, Robert Bullard (7) defined *environmental justice* as the principle that "all people and communities are entitled to equal protection of environmental and public health laws and regulations." In a 1999 interview, Bullard described how "The environmental justice movement has basically redefined what environmentalism is all about. It basically says that the environment is everything: where we live, work, play, go to school, as well as the physical and natural world. And so we can't separate the physical environment from the cultural environment. We have to talk about making sure that justice is integrated throughout all of the stuff that we do" (8).

After years of bureaucratic and legalistic consideration, the U.S. Environmental Protection Agency (EPA) definition further elaborates on this principle by defining environmental justice 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. Fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate share of the negative human health or environmental impacts of pollution or environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies" (9). In spite of sharp changes in U.S. presidential administrations from Clinton to Bush and now Obama, this definition stands as the de facto official policy and legal bar that environmental justice groups must reach to receive government attention.

Environmental justice claims remain contentious for three reasons. First, in its early years, the mainstream environmental movement ignored social justice and equality issues, and many critics argue that it still does. Early work by scientists and activists concerned about environmental issues was done with little regard to underlying social inequalities that drive differential exposures to pollution and did not incorporate voices of people of color and the working classes in solving them. In fact, there is still debate among environmentalists about whether they should attempt to address these issues or should continue campaigning on issues they are more able to influence. That is, there is not a consensus among environmentalists on whether broadening environmentalism to include justice is always a good idea.

Second, documenting the existence of "disproportionate impact" on people of color or poor populations has turned out to not be a simple issue. Because they diverted demands of environmental justice activists, a few studies skeptical of environmental justice claims have gained an extremely high level of attention in research and policy circles. Dozens of studies have piled up as debates evolved on the best ways to solve research problems. Because so much is at stake for policy in how one answers this question, a substantial portion of this review considers this literature.

A third reason environmental justice studies are controversial is that it is not immediately obvious what should be done after an injustice has been documented: Addressing environmental injustice with public policy could involve complex and expensive local, national, or perhaps even global interventions. Solutions, such as relocation of affected communities, which is so ardently sought by some local environmental justice groups, are themselves socially and economically disruptive, and these solutions rarely satisfactory in their outcomes. Workplaces protected by better regulations and enforcement of occupational health standards still face plant closure in the face of globalized production.

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Even with agreement on the principle that hazards should be reduced for everyone, nearer-term compensation and remediation plans turn out to be very messy. In the United States, at least, these broad discussions of a proactive environmental justice policy have barely taken place. It seems that societies that only reluctantly admit inequality and racial injustice have been hesitant to develop plans to solve the problem.

In this review, we first describe the rise of the idea of environmental justice in the academic literature, as it developed in fairly close relation with a social movement of the same name. We review some of the key studies concerning the causes of environmental injustice, focusing on the "chicken or the egg" debate on whether people of color populations or hazardous facilities came to a location first. We review some contentious literature on how to quantitatively measure and document environmental injustice, especially the complex problems of analyzing a wide variety of data, such as postal codes, census tracts, or geographic concentric circles. We review case studies of environmental justice movements, especially focusing on the insights they provide on when these movements tend to win their objectives. We also briefly review the rapidly evolving debate over the justice elements of climate change, both within developed nations and between them and the world's poor nations. Although much of the review has a U.S. focus, the article concludes with a brief discussion of the globalization of the environmental justice movement, discourse and issues, and considers some policy implications of exposing and understanding environmental justice.

One unique feature of this review is its breadth and diversity, given the different experiences and intellectual approaches taken by the three coauthors. The review attempts to point readers to works on the quantitative complexity of documenting environmental injustice, on critical race theories that should be included in any broader conceptual discussion of this issue, on case studies, on the history and politics of environmental justice policy making in the United States and on international climate justice.

2. THE RISE OF ENVIRONMENTAL JUSTICE STUDIES

Many environmental justice scholars and activists point to the Warren County, North Carolina, protests as launching the beginnings of the environmental justice movement. Several civil rights organizations, including the Southern Christian Leadership Conference and the UCC Commission for Racial Justice, provided leadership and support to the demonstrators. The protests gained national media attention and were among the first to raise public awareness about the environmental concerns of African Americans and other people of color (6, 10, 11).

The Warren County protests were not only important because they received national attention, but they also triggered subsequent events that would increase the visibility and momentum of the environmental justice movement. One important consequence of the Warren County protests was that they prompted the GAO to investigate the racial composition of the communities near the four major hazardous waste landfills in the South the next year (4). The 1983 GAO study found that, in all four cases, the communities around the landfills were disproportionately African American. And in three of the four cases, the communities were predominantly African American. Both the Warren County protests and the results of the GAO study prompted the UCC Commission for Racial Justice to ask the question of whether the regionally disproportionate placement of hazardous waste facilities and landfills in the South was part of a national pattern. Accordingly, the UCC then sponsored a study of the racial and socioeconomic composition of communities around hazardous waste sites across the United States (5).

The results of the study were published in 1987 in a report entitled *Toxic Wastes and Race in the United States* (5). The impact of this report proved to be profoundly significant. It represented the first national-level study of the racial and socioeconomic characteristics of

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communities most proximate to hazardous waste sites; it was one of the first studies to employ sophisticated multivariate statistical techniques in the analysis of waste and social characteristics; and the results were compelling. The study found that the average percentage of people of color in zip codes containing at least one commercial hazardous waste facility was double that of zip code areas containing none, and where two or more facilities were located, the average percentage was triple. Furthermore, the percentages of people of color in the zip code proved to be the best predictor of where commercial hazardous waste facilities were located—even after controlling in a multivariate statistical analysis for mean household incomes, mean housing values, quantity of hazardous waste generated, and number of abandoned hazardous waste sites in the zip codes (5).

In 1990, sociologist Bullard published his now classic book, *Dumping in Dixie* (6). This was the first major study of environmental racism that linked hazardous facility siting with historical patterns of spatial segregation in the southern United States. Bullard found that communities of color were being deliberately targeted for the location of society's unwanted waste and that these practices had their origins in both historic and contemporary forms of institutional racism. This study began with Bullard's research on a lawsuit against a waste company accused of discriminatory facility siting in an African American community in Houston, Texas, in 1979. Bullard published research on this and other cases of environmental racism as early as 1983 (12). That local research culminated in the publication of *Dumping in Dixie*, which may have also been the first study to consider the social and psychological effects of environmental racism on local communities.

That same year (1990), sociologists Bryant and Mohai organized the Conference on Race and the Incidence of Environmental Hazards at the University of Michigan, bringing together researchers from around the nation studying racial and socioeconomic disparities in the distribution of environmental contaminants. The scientific analyses presented clearly documented and "overwhelmingly corroborated the evidence of the General Accounting Office and the United Church of Christ reports" (13). The Proceedings of the Conference were forwarded to the EPA and influenced the agency to begin its own examination of the evidence and begin drafting policy proposals. In 1992, the EPA published its findings and recommendations in a report, entitled *Environmental Equity: Reducing Risks for All Communities* (14).

Since 1990, scholars have produced an extensive and sophisticated literature on the dimensions of differential environmental risks on the basis of race and socioeconomic class position (15, 16). Mohai & Bryant (17) performed a meta-analysis of 16 empirical studies on race and class disparities in the distribution of environmental hazards, all of which found environmental disparities that were based on either race or income or both. In six out of nine studies, race was a more important predictor than income of where environmental hazards are located, confirming the UCC's 1987 findings. In a summary of 54 separate studies, Brown (18) similarly noted that both race and class were significant determinates of proximity to known and prospective environmental hazards and the timing and extent of remediation actions. Szasz & Meuser (19) conducted a similar review with similar findings in 1997, as did the U.S. Institute of Medicine in 1999 (9). In a more recent review of the literature regarding differential exposures to environmental pollution, Evans & Kantrowitz (20) found that significant relationships exist between the ethnic and class characteristics of a community and levels of exposure to environmental risk. Most recently, Ringquist (21, p. 223) conducted a meta-analysis of 49 quantitative studies of racial and socioeconomic disparities in the distribution of environmental hazards and concluded that "there is ubiquitous evidence of environmental inequities based upon race."

The second result of the 1990 Michigan meeting was the creation within the EPA of an Office of Environmental Equity, later renamed the Office of Environmental Justice. EPA's

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EXECUTIVE ORDER 12898 OF FEBRUARY 11, 1994

Sec. 1–101. To the greatest extent practicable . . . each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. . . .

Sec. 2–2. Each Federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such, programs, policies, and activities, because of their race, color, or national origin.

Environmental Equity Workgroup produced a report in 1992, entitled *Environmental Equity: Reducing Risks for All Communities* (14). The report gave further weight and increased public attention to environmental justice concerns as it represented the first official acknowledgment by the federal government of the existence of environmental inequalities and the importance of addressing them. The report was widely distributed and almost immediately prompted the U.S. Congress to begin holding hearings on environmental justice.

Several bills were also introduced in the U.S. Congress and in various state legislatures, and by 1994, public attention on environmental injustice had reached a point that President Bill Clinton issued an executive order (see sidebar, Executive Order 12898, **http://www.archives.gov/federal-register/executive-orders/pdf/12898.pdf**) calling on all the agencies of the federal government, not just the EPA, to take environmental justice concerns into account in all rule making. In the meantime, the EPA continued to try to develop an implementable environmental justice policy, principally by relying on the Title VI provisions of the 1964 Civil Rights Act. By applying Title VI, the agency needed only to show that an action by industry or government with regard to a polluting facility would lead to a disparate outcome rather than show that an action was motivated by an intent to discriminate. However, the effectiveness of applying Title VI to future environmental justice cases was later cast in doubt with a Supreme Court ruling (*Alexander v. Sandoval*) in 2001 (see below), and the general strategy of using legal actions to achieve justice in cases of environmental inequality has not fared well (22).

3. DISTANCE, COMMUNITY PERCEPTIONS, AND IMPROVING METHODOLOGIES

While many policy makers were moving forward on environmental justice issues, there were significant methodological questions in scholarly circles around two major issues. First, what was the relative weight of environmental justice claims based on economic class differences versus race? As mentioned at the outset of this review, the policy implications of these kinds of findings are extremely complex, so any doubt that can be raised has been amplified by institutions representing economic and political interests wishing to avoid addressing the problem. Second, and equally troublesome, was the debate over "which came first." Did polluting industrial facilities move into people of color and working-class neighborhoods? Or did the people move where the land was cheapest—to those polluted communities that people with the means to do so avoided? This issue is important both for assigning responsibility for addressing environmental injustices and for avoiding the "resorting" of working-class and people of color populations into areas around toxic facilities because they are the only places they can afford to live. We address both these debates more extensively in the next sections.

3.1. Race versus Class

Although the vast majority of studies of environmental inequality conclude that racism is

the major driving factor, there has been considerable debate in some corners about the degree to which this phenomenon is a function of racial inequalities or class-based market dynamics (17, 23–26). This controversy has become known as the "race versus class debate." This debate has both sociological and political dimensions. As Mohai (27) has argued, if we want to understand the causes of environmental inequality, we need to know what role both race and class play because disparities have been found along both dimensions. Whether racial factors have an added (or interactive) effect with income or vice versa are empirical questions.

To the extent that racial disparities persist when socioeconomic factors are controlled suggests that social scientists need to better understand what aspects of race (whether related to housing discrimination, deliberate targeting of minority neighborhoods for society's unwanted land uses, or other factors) are causally related to the phenomenon of environmental inequality. Similarly, a finding that socioeconomic disparities persist when race is controlled suggests further investigation is needed of the causal links between socioeconomic characteristics and environmental inequality. Such an understanding goes beyond simply an academic understanding of environmental inequality; it also has implications for political and public policy developments. For example, because of the evidence of racial disparities in the distribution of environmental hazards, the EPA has employed civil rights laws (principally Title VI of the 1964 Civil Rights Act) to help develop and implement environmental justice policy. The racial dimensions of environmental injustice have also been an important rallying point and driver for the environmental justice movement as seen in the growth of people of color environmental organizations (28) and the emergence and strengthening of environmental justice networks, such as the Indigenous Environmental Network, the Black Environmental Justice Network, the Asian and Pacific Environmental Network, and the Southwest Network for Economic and Environmental Justice (representing primarily Latino communities).

Despite the mounting evidence from the UCC study and the early reviews, contrary evidence began to emerge in the early 1990s. The first serious challenge to the UCC findings came from Anderton et al. (23), who reported in the influential journal *Demography* results contrary to those of the UCC. Specifically, they found few racial disparities in the distribution hazardous waste treatment, storage, and disposal facilities (TSDFs), even when controlling for regional variation. Socioeconomic disparities were also found to be weak. The best predictor of the location of hazardous waste TSDFs tended to be the percentage of people employed in manufacturing occupations. The researchers argued that the principal reason for the differences in their findings from those of the UCC lay in the use of different units of analysis. The UCC study used zip code areas, whereas Anderton et al. used census tracts. The researchers argued that because census tracts are smaller geographic units than zip code areas, they are less subject to ecological fallacy. That is, relationships found at a larger geographic scale may not exist at a smaller geographic scale.

TSDF: treatment, storage, and disposal facility

Been (29) and Mohai (30) responded by observing that there were additional important differences in the methodologies between the Anderton et al. and UCC studies than simply differences in the selection of the geographic units of analysis. Both recognized that the comparison populations employed in the UCC and Anderton et al. studies were also constructed differently. Specifically, Anderton et al. did not consider rural areas in their analyses, but the UCC study did. In addition, the UCC study included all metropolitan areas in their study, whether or not the metropolitan area included a hazardous waste TSDF. The Anderton et al. study excluded metropolitan areas not already containing a TSDF, arguing that metropolitan areas already not containing such facilities were not likely suited for them in the first place. Both Been and Mohai questioned this assumption. In a subsequent empirical analysis, Mohai (27) found that Anderton et al.'s principal indicator of industrial activity, percent employed in manufacturing, was found to be statistically

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indistinguishable between metropolitan areas containing TSFS and those that do not. And supporting the UCC case, the best predictor of which metropolitan areas contain hazardous waste TSDFs and which do not was found to be the minority percentages of the metropolitan areas. The result is that both Been and Mohai have concluded that Anderton et al.'s results do not refute the UCC study's findings.

The early debates about the evidence used in these studies sparked much interest in conducting further quantitative research on racial and socioeconomic disparities in the distribution of environmental hazards. Much of this research tended to rely on a method that Mohai & Saha (31) subsequently referred to as the "unit-hazard coincidence" method. In this approach, researchers select some geographic unit, such as census tracts or zip code areas, determine which units contain the hazard of interest and which do not, and then compare the demographic characteristics of those containing the hazard with those not containing it. Virtually all national-level environmental justice studies have employed this approach (5, 23, 29, 32–45).

However, Mohai & Saha (31) demonstrated that the unit-hazard coincidence method does a relatively poor job in determining the location of the residential populations living near hazardous sites. This is because such sites are often located near the boundary of the host unit. However, rather than considering these neighboring tracts as part of the host neighborhood, these tracts are lumped together in the comparison group of nonhost tracts and considered to be similar to other nonhost tracts, some of which may be hundreds or thousands of miles from the hazardous facility. When neighboring tracts are grouped with host tracts proper using distance-based methods, the concentrations of poor people and people of color are found to be much greater than what the previous national studies have shown, including the original UCC study (31, 46, 47).

The key features these methods have in common are that they (*a*) take into account the precise point locations of hazardous sites (not just whether a site is located generally within or is coincident with a geographic unit) and (*b*) consider as part of the host neighborhood all other units (not just the host units of census tracts or zip codes proper) that are within some determined distance from the sites. Ringquist (21) also found in his recent review that studies employing geographic information systems approaches (i.e., distance-based approaches) tend to find greater racial and socioeconomic disparities in the distribution of environmental hazards than those employing census tracts or zip code areas alone (i.e., the unit-hazard coincidence approach). Distance-based methods have also tended to lead to a finding of stronger independent race effects than income effects in predicting the locations of environmental hazards in multivariate analyses than has the conventional unit-hazard coincidence method (21, 31, 47).

In addition to improvements in proximity-based analyses, advances have also been made in employing risk-based approaches in environmental justice studies. Rather than examining proximity to the sources of environmental hazards, such as distances to industrial facilities or hazardous waste sites, risk-based approaches examine the dispersion of the pollution risk itself to see where pollution burdens fall. Where pollution burdens fall geographically is typically estimated by mathematical models that take into account the quantity and type of toxic emissions released, timing of releases, stack heights, exit velocities, wind speeds and directions, and other factors. In using such approaches, Chakraborty & Armstrong (48) found significant racial disparities in the dispersion of air pollution fallout in Des Moines, Iowa. However, applying similar approaches to an analysis of pollution fallout in Allegheny, Pennsylvania, Glickman (49) did not find racial minorities to be more greatly impacted than whites. More recently, Ash & Fetter (50) conducted a national-level study that examined the geographic dispersion of air toxics risks modeled from the EPA's Toxic Release Inventory (TRI) and found significant racial disparities. Morello-Frosch & Jesdale (51) recently examined cancer risk estimated from

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air pollution data in the National Air Toxic Assessment. These data take into account air pollution risk from both industrial and mobile sources. Morello-Frosch and Jesdale found that metropolitan areas that were the most racially segregated were also the metropolitan areas with the greatest cancer risk from air pollution. Even whites living in segregated metropolitan areas were found to face greater cancer risk than whites living in metropolitan areas with little segregation. Nevertheless, African Americans and Latinos were found to face the greatest cancer risk in the segregated metropolitan areas.

Although the number of risk-based environmental justice studies has been growing, these are likely to complement rather than replace proximity-based studies. This is because proximity-based studies are useful in examining where people are located in relation to physical structures that may generate environmental justice concerns beyond health outcomes. For example, communities are often concerned about the noises, odors, traffic congestion, risks to children, visual blight, falling property values, and social stigmatization associated with polluting industrial facilities and hazardous waste sites. Furthermore, proximity data in a sense represent "hard" data, in which the physical presence of noxious facilities is subject to minimal ambiguity. Risk analyses are often hampered with incomplete data and imperfect modeling assumptions. Nevertheless, there is increasing sophistication in the methods employed in both types of approaches, and the results obtained from them have helped to advance our understanding of the existence, magnitude, and causes of environmental inequalities.

3.2. The "Chicken and the Egg" Debate

On the chicken and the egg question of whether hazardous facilities or poor/minority populations came first, research on environmental inequality has moved toward longitudinal analysis of the creation of environmental inequalities. In one important study, Pastor et al. (52) show that, over a 30-year period, the correspondence between polluting facilities and minority communities in the Los Angeles basin was based primarily on a pattern of disparate siting of facilities in existing communities of color, rather than on geographic shifts in these populations. In other words, toxic facilities tend to be located in particularly vulnerable communities rather than the other way around, contrary to the "minority move-in hypothesis." These communities were being selected systematically for the location of noxious facilities.

In another recent study spanning a 50-year period in the state of Michigan, Saha & Mohai (53) similarly found a distinct pattern of locating hazardous waste TSDFs in neighborhoods disproportionately composed of working-class and people of color residents. Theirs is one of the few studies to examine facility siting before 1970. They found little evidence to indicate that disparities in facility siting began before 1970 but that such disparities increased significantly during the 1970s and 1980s. They attribute this phenomenon to rising public concerns about environmental hazards during this period, especially about hazardous wastes after the enormous publicity given the Love Canal crisis in the late 1970s, and the greater success of white communities at keeping noxious land uses from being sited in their neighborhoods. As a result of this success, locally unwanted land uses (LULUs) became increasingly diverted to politically more vulnerable low-income and people of color communities, corroborating Bullard & Wright's (54) earlier argument that "not in my backyard" (NIMBY) increasingly became "place in blacks' backyards" (PIBBY).

4. ECONOMIC, SOCIOPOLITICAL, AND RACIAL EXPLANATIONS OF WHY ENVIRONMENTAL INJUSTICES EXIST

Despite the current difficulties in pinning down the precise causes of present-day environmental disparities, several major arguments have emerged. Although going by slightly different

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names or labels, these can be categorized as economic explanations, sociopolitical explanations, and racial discrimination explanations. These have been outlined previously by Mohai & Saha (46, 55) and Saha & Mohai (53). That is, after documenting the existence of disparate impacts, there is the sociological question about why such disparities exist so broadly.

Economic explanations are sometimes referred as market dynamics explanations (56). The principal argument here is that industry is not intentionally discriminating against either racial and ethnic minorities or the poor. Industry is simply trying to maximize profits and hence reduce the cost of doing business. Thus, when siting a new facility, industry seeks to place facilities where land is cheap and where industrial labor pools and sources of materials are nearby. These may be coincidentally where poor people live, and because racial and ethnic minorities are disproportionately poor, the places where industry sites a new facility may also be coincidentally where people of color live. This is the case, for example, along the Mississippi River where old plantation lots represent large pieces of land with access to deep water ports, oil pipelines, and salt brine (11). These places are also bordered by tiny towns made up of shacks where ex-slaves were able to settle after being emancipated during the Civil War.

Furthermore, the racial and socioeconomic composition of the nearby neighborhoods may significantly change after the facility has been sited, further aggravating racial and socioeconomic disparities around such facilities. This is because the facility may introduce negative impacts on the quality of life of the local residents. Such impacts might include visual blight, noise, noxious odors, traffic congestion, fear of health impacts, social stigmatization, and others. As a result, some residents will want to leave the neighborhood. Those most able to leave are the more affluent residents who have the financial means to move to more environmentally desirable, and hence more expensive, neighborhoods. Poorer residents without such means are left behind. The neighborhood thus becomes poorer, and because white residents on average have higher incomes and wealth, the proportion of people of color in the neighborhood will also increase. At the same time, the flight from the neighborhood will depress property values and hence make housing in the neighborhood more affordable. Thus, even more poor people and people of color begin to move in, further increasing their concentration around the facility and further aggravating the disparities in the distribution of such facilities at large.

Sociopolitical explanations involve the argument that industry and government seek the path of least resistance when siting new hazardous waste or polluting industrial facilities (54). Industry is aware that many communities will actively oppose the placing of such facilities in them. Because industry and government do not want to generate controversy or experience delay in moving ahead with siting plans, they seek to avoid communities that are most capable of mounting an effective opposition. These communities are those with abundant resources and political clout and also tend to be affluent, white, and well connected. Poor communities and communities of color become an easier target because they have fewer resources and are not well represented in the decision making of industry and government. Saha & Mohai (53) have argued that NIMBYism grew in the 1970s and 1980s as people's awareness and concerns about toxic hazards grew. Because affluent white communities were more able to mount opposition to the placement of new hazardous facilities, such facilities became increasingly placed in poor and people of color communities. Thus, over time, racial and socioeconomic disparities in the distribution of such facilities have widened. That industry and government are cognizant of and concerned about public opposition to the siting of noxious facilities has been verified in several well-publicized cases (22).

Bullard (6) found that those communities most capable of mounting effective collective resistance tend to be better educated, have greater levels of income, and fewer people of color. In other words, aside from various

tactics, strategies, and political resources that besieged communities can muster, the best predictor of success is pre-existing social capital. This finding is troubling considering the research on the relationship between toxic facility siting and social capital, which finds that a lack of "pre-existing racially based social capital" places communities of color at a disproportionately higher environmental risk than white communities (52). Communities with low levels of voting behavior, home ownership, wealth, and disposable income are more vulnerable to high concentrations of polluting facilities than other communities. Unfortunately, these characteristics are often highly correlated with race.

Two theories not originally focused on environmental justice concerns might be categorized as somewhere in between the economic and sociopolitical explanations of unjust environmental exposures. German social theorist Beck (57–59) argued that late modernity has brought an exponential increase in the production and use of hazardous chemical substances. Despite eventually affecting everyone, Beck points out that the politics of the distribution of environmental degradation favor more powerful communities over others, which, of course, is the basis of the environmental justice thesis. The treadmill of production model of Schnaiberg and colleagues argues that capitalist economies continuously create ecological and social harm owing to the inherent drive to make a profit (60–64). Capitalist market economies require increasing extraction of materials and energy from natural systems, so when resources are limited, the treadmill searches for alternative sources, which are often in indigenous and minority communities. The treadmill of production prioritizes market value uses of ecosystems, despite the fact that other ecosystem uses are biological and social necessities for all classes of people. According to Schnaiberg and colleagues, at the roots of these conflicts are power struggles over access to social, economic, and environmental resources, located primarily in class differences between the wealthy and the workers.

Racial discrimination explanations expand beyond those discussed above. It has been widely debated whether prejudicial attitudes or racial animus play a role in siting decisions (65) or in the lack of responsiveness to the environmental concerns of racial and ethnic minorities (47). Furthermore, even though overtly racist attitudes and actions may be a thing of the past in public policy circles, current decisions that may seem racially neutral on their face may nevertheless have discriminatory outcomes because of past discriminatory actions. Cole & Foster (22), for example, discuss the present-day effects of zoning decisions made in the early 1900s that were intended to segregate blacks from whites and place industrial zones in African American communities. Even though present-day siting decisions may be based on a rational desire to put new facilities in areas that have been zoned industrial, these nevertheless will wind up disproportionally in people of color communities because of past discriminatory decisions about where to put the industrial zones (11). This is an example of what Feagin & Feagin (66) refer to as side-effect discrimination, i.e., discrimination in one area (zoning decisions) leading to discriminatory outcomes in another (siting decisions), even though the latter involves no discriminatory intent. And still other scholars (65, 67, 68) argue that present day racism and the quest for white privilege still motivates policy decisions that result in racially unequal outcomes.

Race can also play a role in the way environmental burdens are distributed through housing segregation (69). The economic explanations discussed above argue that present-day disparities around hazardous sites occur partly because affluent (and hence white) people can more easily move away from contaminated areas, whereas the poor (and hence many people of color) cannot because of constrained financial means. These explanations do not take into account the further constraints on people of color's options to move because of housing discrimination.

Racism should not be reduced entirely to material explanations, however, because it is

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also a cultural, juridical, and psychological phenomenon, and scholarship from the fields of ethnic studies and critical race theory are useful in that regard. In his "black trash" thesis, Mills (70) draws on philosophical and historical texts to connect white racism to an ideological framework that links images of people of color (specifically people of African descent) with barbarism, filth, dirt, and pollution. This also occurs within societies, such as in India, where the Dalits or "untouchables" are viewed as a form of contamination. According to Mills, many whites in the United States and globally view African peoples as a form of social contamination, hence making it that much easier to legitimately locate industrial waste and factory pollution in their nations and segregated neighborhoods. The link between non-European peoples and symbols associated with nature, such as danger, disease, filth, primitive, and savage, is common throughout European history, literature, and contemporary politics in the global North, whether one is speaking of Africans, African Americans, indigenous peoples, Asians, Latin Americans, or the Roma of Europe. Like Mills, environmental philosopher Higgins (71) identifies the cultural sources of these meanings concerning racial and social pollution, in that minority environments are seen as "appropriately polluted" spaces. Racial segregation at work and at home facilitates the production of environmental injustice because "environmental pollution is fittingly relegated to 'socially polluted spaces.'" Mills and Higgins therefore provide a framework for a broader cultural logic and prevalence of environmental racism.

Of course, the above three categories of explanations (economic, sociopolitical, and racial discrimination) are not necessarily mutually exclusive or easy to disentangle. For example, even if people of color communities are targeted for the siting of new locally unwanted land uses because they are seen as less likely to be able to mount an effective opposition (i.e., are among the paths of least resistance), are not the motives of industry also economic (i.e., to reduce the costs associated with delay and possible legal battles)? At the same time, if industry and government consciously use the racial or socioeconomic characteristics of communities (see, e.g., Reference 72) in making decisions about where to site new locally unwanted facilities, do not such decisions begin to raise questions of intent, even if the motives are economic? When there is no intent to discriminate in the siting process, but housing discrimination traps racial and ethnic minorities in polluted neighborhoods, are environmental disparities then nevertheless still an outcome of racial discrimination? Moreover, market forces and class inequalities are never race neutral, revealing what critical race theorists have termed *intersectionality*, which is the fact that race, class, gender, and other social categories are always linked in the experiences of individuals and groups (73). Despite the difficulties of sorting out and pinning down the factors that may result in racial and socioeconomic disparities in the distribution of environmental hazards, the above explanations, at the very least, help identify the range of possible factors that may account for disparate outcomes.

Regarding policy implications, knowing what explains present disparities in the distribution of hazardous and polluting sites may help policy makers (*a*) determine whether more attention should be given to managing the siting process; or (*b*) if disparities are inevitable because poor people and people of color tend to relocate where such sites are located, whether more attention should be focused on eliminating discrimination in the housing market and better informing home buyers of the environmental risks in neighborhoods. Regarding political implications, better understanding of the factors that result in environmental disparities may help identify who is most responsible for such disparities and what role they should play in reducing them.

5. CONTEXTUALIZING ENVIRONMENTAL INJUSTICE: HISTORICAL AND CASE STUDIES

In this section, we consider historical and case studies that give a more contextual

understanding of why environmental inequalities arise in the first place. We also consider the role of the environmental justice movement as a political force that might challenge this phenomenon.

Taylor (74, 75) presents perhaps the most historically comprehensive and conceptually inclusive analysis of environmental injustice in communities and workplaces in the United States. She covers the period from 1820 to 1995 and investigates policies that produce social and environmental inequalities among people of color, women, and working-class populations, as well as resistance movements during that period in a way that challenges traditional conceptual frameworks that narrowly define both environmental concerns and the scope of social justice movements. This is a broad overview that seeks to place environmental justice studies in its proper historical context. The study is also of critical importance because it includes the workplace as a site of environmental injustice and of organizing against this oppression.

In another historical place-based study of the case of the U.S. Steel Corporation's sprawling ironworks in Gary, Indiana, historian Hurley (76) found that Latinos and African Americans faced disproportionately high levels of exposure to environmental toxins both on the job at the steel plant and in their neighborhoods, as a result of local racial discrimination. Class and race led to stark urban political battles. Hurley's book set a new standard for integrating the history of community and workplace issues in an historical study through an environmental justice lens. Pellow & Park (77) found similar results in their research on Latino and Asian immigrant workers and residents in Silicon Valley.

In a book of four case studies, Roberts & Toffolon-Weiss (11) argue that the primary cause of environmental inequalities in the state of Louisiana is an alliance among business, the state, and other "growth machine" interests to create a good business climate that favors private profits over public and environmental health. In cases of Native American, African American, whites and other groups fighting for clean air and safe neighborhoods, the authors argue that the growth machine was the major driving force working against the cause of environmental justice. The idea of a growth machine comes from Logan & Molotch's book *Urban Fortunes: The Political Economy of Place* (78). Contrary to earlier theories of urban sociology, land parcels in cities are not simply empty fields awaiting human action. Rather, land is linked to specific interests—commercial, sentimental, and psychological—that shape cities. Critically important in this process of shaping cities were the real estate interests of those whose properties gain value when growth takes place. Dominant players in urban, national, and international politics share a consensus that unlimited economic growth is a positive force for society. They may have varied interests, networks, and foci, but the one thing they all reach consensus on is the need for unrelenting growth. They are united also in the belief in value-free development—the belief that the free market alone should determine land use. Logan & Molotch argue exactly the opposite: that often growth is not good for all. And in fact, growth is never distributed or enjoyed evenly across populations. Logan & Molotch argue that in the United States the growth machine ideology is so strongly ingrained in our culture that resistance against it is often seen as an illogical and disruptive effort to interfere with the natural forces of the market place. Roberts & Toffolon-Weiss reveal that Louisiana's unique racial and industrial history intersected to produce forms of environmental injustice perhaps at the extreme of the U.S. continuum, suggesting the need for further historical and placed-based scholarship on this topic that might complement the existing quantitative methodological research.

In their study of the state of Massachusetts, Faber & Krieg (79) found that poor and working-class whites and people of color face greater toxic threats than middle-class and affluent whites. These threats include hazardous waste sites, landfills and waste transfer stations, polluting industrial facilities, power plants, incinerators, and measures of cumulative

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environmental hazards. The authors found that a combination of white flight and middle-class flight to the suburbs, the rise in the number of people of color in the central cities, and increases in illegal dumping and the siting of incinerators produced environmental inequalities in that state.

In studies of Torrance and Los Angeles, California, Pulido et al. (68) demonstrated that, as a result of racially biased urban planning during the last century, Chicanos faced the highest levels of exposure to industrial pollution in those cities when compared to Anglos. Similarly, Boone & Modarres (80) argue that, in Commerce, California, although hazardous industry was sited in close proximity to Latino populations, zoning and urban planning practices had as much, if not more, to do with industrial location decisions as demographics and racial politics. As they state, "demographics alone are not responsible for the concentration of manufacturing in Commerce" (80). They emphasize the importance of place-specific analysis to determine the root causes of environmental inequalities.

On that note, Houston, Texas, is famous for its lack of zoning laws. Despite or because of this absence of zoning, Bullard (6) demonstrates that all of the city of Houston's municipal landfills are located in African American neighborhoods. In this case, he maintains that there was de facto zoning by Houston's powerful white city leaders, who viewed African American neighborhoods as appropriate sites for waste disposal. Bullard concludes that racism is a fundamental organizing principle of politics and planning in America.

Communities of color and working-class neighborhoods have hardly been quiescent in the face of environmental injustice. But when do environmental justice movements arise and under what conditions do they succeed or fail? Studies of environmental protest movements have tended to focus on the cases that garner greatest media exposure and those in which participants are successful. Therefore, it is difficult to say with certainty which factors lead both to the mobilization of local people against an unwanted land use and to that group's success in fighting it. However, there are some important insights we can draw from some of the substantial number of case studies that have now been conducted on environmental justice struggles. Obviously, these cases answer different questions than the quantitative approaches, and/or complement those findings.

For those working-class communities fighting waste incinerators, Walsh et al. (81) found that it was far more difficult for communities to close existing facilities than it was to stop new ones. Roberts & Toffolon-Weiss (11) found this pattern applied in Louisiana as well. Gaining the support of outside groups, such as Greenpeace or the Louisiana Environmental Action Network, which had experience fighting these sorts of battles, was important in drawing out these struggles and gaining press coverage. However, this was not sufficient to win, as the authors found with the Agriculture Street Landfill and Grand Bois oilfield waste dumping cases. Another key factor that corresponded to environmental justice movement success was whether communities had secured representation by public interest law clinics and firms, rather than private injury tort lawyers. Earthjustice (previously named the Sierra Club Legal Defense Fund) was a key part of the coalition that successfully blocked the Louisiana Energy Services uranium enrichment facility in Homer, Louisiana. The Tulane University Environmental Law Clinic was also critical for the successful effort to stop the Japanese Shin-Etsu Chemical Company from building a major facility in the majority African American town of Convent, Louisiana (82).

6. THE GLOBALIZATION OF ENVIRONMENTAL JUSTICE, THE RISE OF CLIMATE JUSTICE

Shortly after the movement for environmental justice in the United States made headlines in the early 1980s, activists and policy makers began to take notice of similar patterns of environmental inequality around the globe. Scholars of environmental justice studies and

international relations have begun to tackle the question of global environmental inequality/racism. Two levels of inequality are being increasingly cited: transnational and global (83). Extraction-based corporations are expanding operations to the remotest corners of the world, but the people affected there are sometimes able to utilize electronic communications to gain wider attention to their plight. Transnational solidarity work provides new approaches to formalize the gains of environmental justice movements and avoid the flight of firms from environmental and worker health regulations at home (84). Meanwhile, some hazards such as climate change are truly global, worsening existing inequalities in terms of who caused and suffers from the problem, and who has the resources to cope with its mounting impacts (83, 85).

Much of the existing research on the internationalization of risks comes from legal scholars wrestling with problems of international and domestic law on the waste trade—specifically the legislation and treaties enacted to control these activities (86–89). The legal literature centers mainly on one major pressing question: To what extent can domestic regulation and international agreements control or minimize the waste trade? A growing body of social science research has begun to pay attention to the social and economic driving forces behind the waste trade as well (90–93). If one makes only a cursory examination of the nations importing waste (legally or illegally) into their borders, it immediately becomes clear that they are states on the geopolitical and economic periphery, nations that have endured colonization in the last several centuries, and they are most often nations populated by a majority of people of color. Other studies observe that communities in the Global South—including and especially indigenous communities—are targeted for polluting industrial facilities and extractive industries and are fighting back (94).

The case of the United States-Mexico Border reveals a host of concerns associated with the globalization of environmental injustice. In 1994, the North American Free Trade Agreement (NAFTA) went into effect, deepening the linkages among the economies of the United States, Mexico, and Canada. Trade officials and politicians promised a cautious public in all three nations that jobs would be created and economic prosperity would prevail and that environmental problems would be addressed through sustainable development (95). Instead, since NAFTA went into effect, hundreds of thousands of jobs left the United States for points South, and eventually, some 240,000 jobs left Mexico for other nations with even lower labor costs (96).

On the environmental front, NAFTA's Commission for Environmental Cooperation (CEC) has the power to document environmental injustices but has no enforcement authority to address these problems. Since 1994, truck traffic from Tijuana, Mexico, to San Diego, California, has increased 60%, pumping carcinogenic diesel fumes into the air on both sides of the border. Although the U.S. Toxic Release Inventory is certainly an imperfect system, Mexico's version of the registry is far worse; as of 2004, only 5% of companies required to report their industrial toxic discharges were doing so. Moreover, with the cancellation of the U.S. Haztraks program in 1993, today there is no functioning system that monitors the transportation of toxic substances across the border (97). In Mexico's Colonia Chilpancingo community, a United States-owned abandoned battery recycling factory left 23,000 tons of toxics on site. NAFTA's CEC deemed this property a "grave risk to human health" but had no authority to enforce a cleanup action. Only when grassroots activists and social movement groups came together to raise public awareness and demand action did the Mexican government begin to clean up the area. This was the result of cross-border, binational community-based organizing by social movements in the United States and Mexico. So although NAFTA is a glaring example of the globalization of environmental injustice, the grassroots response on the border region reflects the globalization of environmental justice movements.

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The electronics or information technology industry has been widely hailed as a foundation of the new high-tech economy and a sector where people can create and enjoy untold economic prosperity. Industry executives and many elected officials have also declared electronics an ecologically pristine and sustainable sector.

Unfortunately, the evidence does not support these claims. Low wages and significant occupational health hazards characterize many production-level jobs in the industry, as unions are virtually absent, and many workers confront up to hundreds of chemicals on any workstation. The electronics industry is heavily reliant upon industrial chemicals and produces extraordinary volumes of waste and wastewater. Inside and outside the workplace, we find evidence of environmental inequality, as many employees in the most hazardous jobs are immigrants, female, and people of color; in addition, the toxics discharges outside electronics plants are strongly correlated spatially with class and race (77).

These patterns hold true for the disposal of electronic consumer products as well. When the tons of obsolete electronics consumer goods are disposed of each year in wealthy nations, this "e-waste" is often shipped to urban areas and rural villages across Asia, Africa, and Latin America, where residents and workers disassemble them for sale in new manufacturing processes or where they are simply dumped as waste. Because each computer contains several pounds of highly toxic materials, this practice creates a massive transfer of hazardous waste products from North to South, and it is responsible for impacting public health and the integrity of watersheds in numerous nations in Asia, Africa, and Latin America. There is a sophisticated transnational movement effort that has come together to document these problems, and activists have had success at changing corporate environmental policies and passing local, national, and international legislation to address the worst dimensions of the e-waste crisis (98).

Recently, these networks have succeeded in pushing several states in the United States, the European Union, and companies, such as Dell, Apple, HP, and Compaq, to enact policies to take back electronics at the products' end of life to recycle them and prevent their export and, in some cases, to reduce the use of toxic inputs in production processes. To better coordinate transnational movement activities concerning the electronics industry, activists from around the world convened to launch the International Campaign for Responsible Technology in 2002.

In the early 2000s, the term environmental justice began to be applied to issues outside of the United States. In some cases, the term was explicitly and consciously adopted with the help of environmental justice leaders, such as at a major conference in Rio de Janeiro, Brazil in 2001 when several environmental sociologists were among the Americans brought in specifically to share insights with Latin American activists and academics from U.S. experiences (99). Organizers of the conference, with funding from the Ford Foundation, saw the term environmental justice as a way to weave together the interests of two major factions in Brazilian movements: bioenvironmentalism/nature conservationists, on the one hand, and those working on social justice, equity, and citizenship, on the other. The meeting and additional organizing activities and academic work have led to the use of the term environmental injustice to describe the location of major hydroelectric projects, urban toxins and waste, and imported hazardous industries in poor, ethnic minority rural regions, and indigenous communities in Latin America. The term has also been applied to the issue of climate change in the region. It is safe to say that environmental justice has become a global concern and a global movement (100).

Climate change reflects and increases social inequality in a series of ways, including who suffers most its consequences, who caused the problem, who is expected to act, and who has the resources to do so. Several studies have documented this inequality at the international level (83, 101–103), but a growing number of groups and scholars are showing injustice within nations between who is vulnerable to climate disasters by race, ethnicity, class and

gender (e.g., Reference 104). Adaptive/resilience resources are clearly unequally distributed by old social divisions, as was shown so clearly in the United States by the aftermath of Hurricane Katrina.

A whole new sociology of Katrina has emerged, reflected in a collection of essays published by the Social Sciences Research Council and recent research authored and edited by Bullard and his colleagues, among others (105–107). This work included research focusing on injustice in who lived in neighborhoods prone to flooding, who got evacuated during the flood, experiences during evacuation, whose neighborhoods have been rebuilt or given over to the swamp, who is represented in decision making in the process of rebuilding New Orleans and other locations around the nation, and so on. Major questions for this review are whether Katrina represents the tip of a very big iceberg of climate disasters, which divide humans by race and class, and what can be learned from this (truly dreadful) experience. The storm can be seen as raising national and international appreciation for the existence of savage inequalities that leave communities very unequally exposed to environmental risks. What remains unanswered is whether addressing the issues of climate change and the need for environmental reform will come to include the need to address these deep social inequalities.

A climate justice movement is emerging that seeks to assure that these kinds of lessons are indeed learned and incorporated into social policy at the national and international levels. Several strands of the movement exist, and new flavors seem to be emerging. One group emerged from the Durban conference on racism in 2001 and led to the creation and strengthening of several international environmental justice and human rights networks. Another group that emerged is the Environmental Justice and Climate Change network, which was launched in the run-up to the Poznan Conference of the Parties of the UN Framework Convention on Climate Change of that year. This network split explicitly from the major Climate Action Network, opposing carbon trading in favor of a carbon charge proposal. In 2009, the West Harlem-Environmental Action, Inc. convened a major conference on climate justice, putting forward a platform for action in the United States.

One difficulty and source of confusion is that there are differences in the uses of the term climate justice between European users and those more common among U.S.-based environmental justice activists. One root of the split is a different approach on whether one is talking about international dimensions of inequality and the flow of resources between states that a climate treaty might require, or simply raising the issues of environmental justice communities around the world that are suffering from climate impacts. A related problem is the continuing use of the term by law scholars, implying that any legal issues raised by climate change are issues of climate justice. This same issue plagues interdisciplinary and international work on environmental justice, which many law scholars and practitioners claim describes their work as a whole.

7. CONCLUSION: NEW DIRECTIONS FOR ENVIRONMENTAL JUSTICE

The U.S. environmental justice movement was largely stalled for the eight years of President George W. Bush's administration. A Supreme Court ruling (*Alexander v. Sandoval*) in 2001 reversed earlier court interpretations of Title VI, making EPA's ability to rely on Title VI for environmental justice policy less certain. Indeed, environmental justice policy at the federal level has not made much progress in the past 10 years (47). Greater optimism is seen for President Barack H. Obama's administration, especially in light of greater Democratic majorities in both houses of Congress and the appointment of the first African American EPA director, Lisa Jackson.

In spite of the difficult climate during the Bush administration, attention to environmental justice was raised in 2007 by hearings held in the U.S. Senate, focusing on EPA's handling

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ENVIRONMENTAL JUSTICE POLICY PROPOSALS

Key Policy Proposals from *Toxic Wastes and Race at Twenty 1987–2007: Grassroots Struggles to Dismantle Environmental Racism in the United States*, which the authors submitted to the Senate Subcommittee on Superfund and Environmental Health during hearings held July 2007.

1. Hold Congressional Hearings on EPA Response to Contamination in EJ [environmental justice] Communities;
2. Pass a *National Environmental Justice Act* Codifying the Environmental Justice Executive Order 12898;
3. Provide a Legislative "Fix" for Title VI of the Civil Rights Act of 1964 that was gutted by the 2001 *Alexander v. Sandoval* U.S. Supreme Court decision that requires intent, rather than disparate impact, to prove discrimination;
4. Require Assessments of Cumulative Pollution Burdens in Facility Permitting;
5. Require Safety Buffers in Facility Permitting;
6. Protect and Enhance Community and Worker Right-to-Know;
7. Enact Legislation Promoting Clean Production and Waste Reduction;
8. Adopt Green Procurement Policies and Clean Production Tax Policies;
9. Reinstate the Superfund tax;
10. Establish Tax Increment Finance (TIP) Funds to Promote Environmental Justice-Driven Community Development.

of environmental justice matters, and by the release earlier that year of an update of the UCC report, entitled *Toxic Wastes and Race at Twenty 1987–2007: Grassroots Struggles to Dismantle Environmental Racism in the United States* (47). By using updated information on hazardous waste facility locations, demographic data from the 2000 Census, and newer and better methods of determining where facilities and people are located, this report found that the poor and people of color are more heavily concentrated around such facilities than what previous studies found, including the 1987 UCC Report. In fact, the 2007 report found that people of color make up the majority (56%) of those living within 3.0 km of where hazardous waste facilities are located, in spite of being only 30% of the national population (47). And where two or more facilities are clustered, people of color make up 69%. In addition to the updated analysis of the distribution of hazardous waste facilities, *Toxic Waste and Race at Twenty* also contained a number of important recommendations for addressing environmental injustices in the United States. Ten key environmental justice policies were identified for implementation by Bullard and colleagues (47) (see the Environmental Justice Policy Proposals sidebar) and forwarded to Senator Hillary Clinton, who chaired the 2007 Senate hearings. This letter was signed by over 100 environmental justice leaders, organizations, and academics.

Because of the stalemate at the federal level in the United States, considerable efforts have been made at the local levels to develop environmental justice policies. Currently 41 states have some policy on environmental justice, and California has enacted an environmental justice law. In spite of these efforts, many believe that federal and state actions have not achieved measurable results (47). Nevertheless, the environmental justice movement has raised public attention and spurred some government efforts on this issue. This review shows how academic interest has increased rapidly in the past two decades with sponsored research and peer-reviewed publications appearing in a wide range of disciplines, including sociology, law, geography, urban planning, public health, economics, political science, and others. Many colleges and universities offer courses and even whole programs in environmental justice studies. Although many observers believe that the problems associated with disparate environmental burdens will not be easily solved, and Foreman (108) argued that environmental justice would quickly become a distant memory, the growth in the numbers of grassroots organizations, academic institutions, and government agencies working on environmental justice have created enough critical mass and momentum that it does not seem likely attention to this issue will fade any time soon.

Looking ahead on new trends in research on environmental justice, we expect continuing studies in most or all the issues discussed above, and two exciting new lines need special attention. Although health concerns related to industrial pollution and hazardous wastes often are

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the trigger that mobilizes communities in environmental justice controversies, surprisingly little research has been conducted to determine the extent that racial and socioeconomic disparities in environmental exposures are related to racial and socioeconomic disparities in health and mortality (20, 56, 109). Although quantitative environmental justice studies have examined racial and socioeconomic disparities in the distribution of environmental hazards and epidemiological studies have examined the health effects of the environmental contaminants, the two bodies of research have not yet been effectively brought together. Evans & Kantrowitz (20) identify many of the challenges of doing so. First, they point out that data on environmental exposures broken out by race and income are still very thin for many settings, including the workplace, schools, and neighborhoods. Second, even if such data were adequate, isolating the effects of environmental factors is very difficult as the populations that are exposed are also affected by a myriad of other suboptimal conditions, e.g., poor housing, poor schools, lack of access to health care, insufficient nutritious food, lack of outdoor recreational opportunities, neighborhood crime, psychological stressors, and others. In addition, there is currently a lack of sufficient longitudinal data that would allow for an examination of how changes in environmental exposures over time are linked to health outcomes over time as well as how such changes are moderated by race and income. Evans & Kantrowitz point out that much more effort needs to be done to collect both environmental exposure data and health data by race and income. More also needs to be done to examine temporal links and determine how race and socioeconomic effects on health are mediated by exposures to multiple environmental stressors.

On the basis of environmental justice/social green ideology that environmental problems were at their root based on human oppression of other humans, for years people have acted on the assumption that achieving social justice would move us down the road to environmental sustainability. This is certainly not turning out to be an automatic relationship, and the two can sometimes be quite different endeavors. Therefore, a second and challenging new line of research is being opened by Agyeman in questioning how justice and sustainability actually might fit together. His chapter in his 2003 coedited volume *Just Sustainabilities: Development in an Unequal World* (110) and his 2006 book *Sustainable Communities and the Challenge of Environmental Justice* (111) begin the development of a new theoretical perspective. The Just Sustainability Paradigm is "the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, while living within the limits of supporting ecosystems" (110). He argues that the Just Sustainability Paradigm broadly "requires sustainability to take on a redistributive function," and local groups taking this approach "are operating within an EJ [environmental justice] framework but are also exploring the wider and emerging terrain of sustainable development." Returning to the core point, these two different demands must both be kept in the forefront, and one alone will not lead us to enduring solutions.

As mentioned in the last section, there are now numerous transnational social movement organizations concerned with environmental justice and human rights issues focused on a range of state and industrial sectors. Taken together, these global organizations and networks constitute a formidable presence at international treaty negotiations; within corporate shareholder meetings; in the halls of congresses, parliaments, and city councils; and within local community settings. Even so, they are only a part of the broader global movement for environmental justice. Arguably, the most important components of that movement are the domestic local, regional, and national organizations in the various nations and communities in which scores of environmental justice battles rage every day. Those groups provide the frontline participants in the struggles and local legitimacy for transnational social movements and their networks. Together, the numerous local grassroots organizations and their collaborating global networks produce and maintain a

PRINCIPLES OF ENVIRONMENTAL JUSTICE

Participants of the First National People of Color Environmental Leadership Summit, held October 24–27, 1991, adopted the following principles:

1. Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.
2. Environmental Justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.
3. Environmental Justice 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. Environmental Justice 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. Environmental Justice affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples.
6. Environmental Justice 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. Environmental Justice demands the right to participate as equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement and evaluation.
8. Environmental Justice 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. Environmental Justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.
10. Environmental Justice 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. Environmental Justice 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. Environmental Justice 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 our communities, and provided fair access for all to the full range of resources.
13. Environmental Justice 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. Environmental Justice opposes the destructive operations of multi-national corporations.
15. Environmental Justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.
16. Environmental Justice 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.
17. Environmental Justice 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.

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critical part of the transnational public sphere (84).

Today, environmental justice and human rights movements are merging together as a global force for social change and democratization. Activists in Europe, the Americas, Africa, and Asia are collaborating to challenge socially and ecologically harmful state and corporate polices concerning hydroelectric power, incineration, and mineral extraction, for example, while offering alternatives for sustainability and social justice. Articulating a vision of global justice and human rights, the Principles of Environmental Justice (see box)—drafted in 1991 at the First National People of Color Environmental Leadership Summit in Washington, DC—contained a number of key demands in this vein. The principles declared rights "to be free from ecological destruction"; to be "free from any form of discrimination or bias"; the "right to clean air, land, water, and food"; the "right to political, economic, cultural and environmental self-determination of all peoples"; and the right "to a safe and healthy work environment." Importantly, principle 10 argues that governmental acts of environmental injustice are violations of international law and of "the Universal Declaration On Human Rights, and the United Nations Convention on Genocide." Taken separately and together, these principles speak impressively to a body of international law and human rights that has been in development for six decades (112). More importantly, in order for these principles to become reality, states and corporations would have to undergo dramatic transformations that would embrace democracy as standard operating procedure. The work of activists in the environmental justice and human rights movements has become quite sophisticated at combating global environmental inequalities through the engagement of a range of institutions, thus developing an emerging form of global citizenship that might ultimately lead to greater democratization of our global society. In their turn, transnational environmental justice movements may bring new external levers and emerging global norms back into the United States, whence this movement and scholarly field began.

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SUMMARY POINTS

1. Environmental justice scholarship and the movement by the same name were inspired initially by protests in Warren County, North Carolina.
2. Hundreds of studies have now documented unequal exposures by race, ethnicity, and economic class.
3. Disproportionate impact of hazards on minority communities can occur regardless of racist intent.
4. Unequal enforcement and unequal attention by agencies and corporations in cleaning up affected neighborhoods or relocating residents also are part of the problem.
5. Explanations for the existence of environmental injustice include economic inequality, sociopolitical exclusion, and racial discrimination.
6. Globalization has created new patterns of exposures and opportunities for environmental justice movement building.
7. Climate change has been shown to create unequal impacts on communities of color, indigenous peoples, the poor, and on developing countries.

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FUTURE ISSUES

1. Research is needed to tie racial disparities in environmental burdens to racial disparities in health. The same is true of economic inequalities.
2. Research is needed to examine the promises and pitfalls associated with the globalization of environmental justice struggles.
3. Research is needed to explore the environmental justice implications of climate change impacts and proposed solutions.
4. The potential role of green technologies and green businesses in reducing exposures and unequal exposures to risks are unknown.
5. There is a critical need for understanding the role of efforts to achieve just sustainability—the combination of social justice and sustainability in policy making.
6. Policy options in response to documented environmental injustice are underdeveloped.

DISCLOSURE STATEMENT

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NOTE ADDED IN PROOF

J. Timmons Roberts was affiliated with the College of William and Mary when this article was written.

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