

# **Environment and Society**

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Dr. Bradley H. Brewster

# Encyclopedia of Sociology

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Edgar F. Borgatta  
Rhonda J.V. Montgomery

Second Edition

Encyclopedia of Sociology  
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# Encyclopedia of Sociology

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Second Edition

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## ENVIRONMENTAL EQUITY

The scientific study of the social distribution of environmental impacts has quickly become an important area of inquiry within environmental sociology. Scholarly interest in this topic—which has been referred to as environmental justice,

environmental equity, or environmental racism—does not derive from formal theories of differential environmental impacts, but rather has been inspired by the rapidly evolving environmental justice movement. Sociologists have studied both the social movement itself and the claims of environmental inequity made by the movement's proponents. The study of environmental justice has important implications for other areas of sociology, including stratification, race relations, sociology of health, and the study of social movements.

### THE ENVIRONMENTAL JUSTICE MOVEMENT

**Origins of the Movement.** In the summer of 1978, the state of New York finally acknowledged what the residents of Love Canal had suspected for some time—that some of the 21,000 tons of chemical waste that had been dumped into an abandoned canal between 1942 and 1952 were now leaking into the basements of nearby homes and percolating into the playgrounds of the elementary school that had been built directly above the filled canal (Levine 1982). The situation presented “great and imminent peril to the health of the general public residing at or near the site,” according to the New York state commissioner of health (as quoted in Levine 1982, p. 7). This announcement galvanized the concerns and suspicions of many residents of this working-class community, who for years had endured bad smells, mysterious sinkholes, skin irritations, respiratory problems, spontaneous abortions, and birth defects. Soon after this announcement, the private concerns of individual people began to develop into an organized social protest that pressured the state and federal governments to take action to protect the health, safety, and property of the citizens.

The events at Love Canal continued to make national headlines for the next two years. In 1979, before the media or the public could forget about environmental health risks, an accident occurred at the Three Mile Island nuclear power plant near Harrisburg, Pennsylvania (Walsh 1981). Large quantities of radioactive gas and water were released, and over 100,000 residents within a 15-mile radius of the plant were evacuated. Overnight, public support rallied behind local anti-nuclear groups that had previously been viewed as radical.

Soon after, grassroots anti-toxics movements began to proliferate in the United States. In addition to the media attention given to Love Canal and Three Mile Island, a number of other factors set the stage for the emergence of these movements. The growing popularity of the mainstream environmental movement and books such as Rachel Carson's *Silent Spring* (1962) had made much of the public aware that there were health hazards surrounding man-made chemicals, that citizens could be exposed to them unknowingly, and that technical and political solutions to such problems were not readily available (Cable and Shriver 1995; Freudenberg and Steinsapir 1992; Szasz 1994). In addition, problems associated with the unsafe disposal practices used during the post-World War II industrial boom began to surface at this time, causing increasing discovery of new toxic contamination problems.

Racial issues quickly became central to the environmental justice movement. The first environmental justice protest organized by African Americans took place in 1982 in Warren County, North Carolina, where the state proposed to build a landfill for the disposal of hazardous polychlorinated biphenyls (PCBs) that had been illegally dumped in 14 different North Carolina counties (Bullard 1994). This was a poor, mostly black, rural community. Why had this community been chosen to receive the landfill? Local residents believed that race was a deciding factor. They called upon black civil rights leaders for support, and a protest was organized. Although the landfill was eventually constructed, the Warren County protest was a landmark in the history of the environmental justice movement. Since then numerous other communities of color, primarily African American, Hispanic, and Native American, have become active in the environmental justice movement (for examples, see Bullard 1993 or Hofrichter 1993).

The formation of local-level anti-toxics movements has tended to follow a general pattern (Cable and Benson 1993; Cable and Shriver 1995). The first stage is the recognition that there is a local toxics hazard. Often, this recognition is a result of health problems among members of the community. Thus it is frequently women, particularly housewives, who are the first to become involved with toxics issues, since they are most likely to take responsibility for the health of the family (Krauss 1993; Brown and Masterson-Allen

1994). Once a toxics problem is perceived by community members, they typically turn to official administrative and regulatory bodies for correction of the problem. The results are usually disappointing, and residents often come to believe that these institutions actually serve the interests of polluters more than the interests of residents (Bullard 1994; Cable and Benson 1993; Krauss 1989; Levine 1982; Molotch 1970). A sense of injustice, and often a deep sense of betrayal, develops among local activists, and they begin to pursue alternative means of social control through social movement organizations.

Most anti-toxics movements emerge in poor, working class, or minority communities (Brown and Masterson-Allen 1994; Freudenberg and Steinsapir 1992). Many activists and analysts alike argue that this is due to the disproportionate share of toxic pollution borne by these communities (Austin and Schill 1991; Bullard 1994). More affluent communities have more resources to draw on—including adequate funding, an educated membership, access to professional advice, and social networks that overlap with local power structures—and thus they are better able to control pollution problems through the political and regulatory processes (Hurley 1995; Molotch 1970).

The notion that less powerful communities have been targeted for polluting facilities was further reinforced by the widespread circulation among the grassroots community of a report written by the consulting firm Cerrell Associates, Inc. for the California waste industry. The report recommended that waste incinerators would most easily be sited in communities least likely to generate political resistance (i.e., communities that have populations that are older, more conservative, less educated, and have lower average incomes) (Cerrell Associates, Inc. 1984; Cable and Shriver 1995).

**Relationship to Mainstream Environmental Groups.** The environmental justice movement differs significantly from the “mainstream” environmental movement in terms of its membership, values, and tactics. The mainstream environmental movement has focused primarily on issues of conservation of natural resources and preservation of natural beauty. Membership in mainstream environmental organizations grew rapidly in the United States from 1960 to 1990, with three groups—the Sierra Club, the National Wildlife

Federation, and the National Audubon Society—each claiming more than 500,000 members (Mitchell et al. 1991). Mainstream environmental groups have professional staffs, generate funds through large foundation grants and membership dues, and work primarily within the system by using lobbying and litigation to influence government action.

Mainstream environmentalism has often been characterized as an elite movement. Early studies supported this general view when they found the greatest support for environmental causes among people who are young, white, well-off, urban, well-educated, and politically liberal (Buttel 1979; Buttel and Flinn 1974; Kreger 1973; Morrison et al. 1972). Some more recent research has confirmed these findings (Jones and Dunlap, 1992). However, one longitudinal study suggests the well-educated and well-off were simply the first to embrace environmentalism (Kanagy et al. 1994).

There has been some debate about the role of race in mainstream environmentalism. It has been common for social scientists to assume that African Americans will be less supportive of environmentalism than whites, but most evidence suggests that when it comes to environmental concern, there is no significant difference between blacks and whites (Jones and Carter 1994). Blacks *are* less likely, however, to be involved in mainstream environmental action (Taylor 1989; Mohai 1990). One explanation for this lag in environmental action is that blacks are more likely to experience a variety of stressors which detract from their ability to act upon environmental concerns. As Robert Bullard put it: “Decent and affordable housing, for example, is a top environmental problem for inner-city blacks” (1994, pp. 10–11).

In contrast to mainstream environmentalism, environmental justice movements tend to develop in poor, working class, or minority communities (Brown and Masterson-Allen 1994; Freudenberg and Steinsapir 1992). The two movements also have different goals—concerns about local health threats are central to the environmental justice movement. Protests often focus on pollution-generating facilities, such as factories, landfills, toxic waste dumps, incinerators, or nuclear power plants. Participants in these movements are generally people who believe they are personally at risk from the

facility. Thus, at least initially, these protests are generally grassroots-generated, and locally focused.

This focus on local issues has prompted some members of the mainstream environmental movement to charge that environmental justice activists are mere “NIMBY” (Not In My BackYard) protesters (Freudenberg and Steinsapir 1992). They accuse environmental justice activists of lacking concern for the environment in general and of acting out of pure self-interest. In turn, environmental justice activists have accused the mainstream environmental movement of representing elite interests and being content to let disadvantaged groups bear the toxic burden of modern affluence. As relative newcomers to environmental activism, members of the environmental justice movement have generally been disappointed with the lack of assistance given their cause from the larger, more established environmental groups (Bullard and Wright 1992; Taylor 1992).

Grassroots environmental protests have tended to use different tactics than the mainstream environmental groups. They typically lack the funds or the political clout to lobby and negotiate with elites. Thus they are more likely to use disruptive and attention-getting tactics, such as public protests, sit-ins, letter writing campaigns, and attendance at public hearings (Bullard 1994). In one extreme example, a group of residents in Love Canal took an EPA official hostage for several hours in an effort to generate media attention (Levine 1982). Environmental justice groups have also made use of the courts, primarily through tort actions that seek reparations for damage to health and property.

These differences between the two movements have had conflicting implications for social movement theory. The elite membership of mainstream environmental groups has often been viewed as support for *resource mobilization theory*. This theory proposes that the emergence of social movements has little to do with the existence or extent of grievances experienced by movement participants. Grievances are a given, everyone has them, and the development of active social movements depends upon the availability of resources available to particular groups of people to advance their causes (McCarthy and Zald 1977). In contrast, the environmental justice movement is based on grievances and is comprised of members with relatively

little resources. Current social movement theory appears inadequate to explain the environmental justice movement (Brown and Masterson-Allen 1994; Masterson-Allen and Brown 1990; Walsh 1981; Walsh et al. 1993).

**Expansion of the Environmental Justice Movement.** The environmental justice movement has evolved beyond its origin in the late 1970s as a collection of isolated local protests. Regional coalitions, such as the Southern Organizing Committee and the Southwest Network for Environmental and Economic Justice, have formed to facilitate the sharing of ideas, resources, and networks among geographically dispersed groups. A number of national support organizations have also been formed, most notably the Citizen’s Clearing House for Hazardous Waste (led by Lois Gibbs of Love Canal) and the National Toxics Campaign Environmental Justice Project (Moore and Head 1993). These organizations provide resources and information to smaller groups, and have conducted their own organizing and lobbying campaigns at the national level. Activists have also connected with the academic community, and a number of research and support centers for environmental justice have been established. These include the Environmental Justice Resource Center at Clark Atlanta University in Atlanta and the Deep South Center for Environmental Justice at Xavier University in New Orleans, among others (Wright 1995). Members of the environmental justice movement have increasingly sponsored meetings and panels that bring together activists, scholars, and the media.

Institutional responses to the environmental justice movement have also increased at the national level. In 1992 the Environmental Protection Agency established an Office of Environmental Equity (Cutter 1995). In 1994, President Clinton signed Executive Order 12898, which requires every federal agency to adhere to principles of environmental justice in its operations (Clinton 1994). The issue of racial disparity has allowed activists to file administrative complaints under Title VI of the 1964 Federal Civil Rights Act.

**A New Worldview—Ecological Democracy.** Many scholars have noted the profound change in worldview that often results from individual participation in the environmental justice movement. As noted earlier, environmental justice activists



often become disillusioned with the ability of the government to protect them from toxic contamination. This change is often conceived as a reframing of the toxics problem: what was initially perceived as an isolated technical or regulatory problem is now seen as a larger social issue involving the relative power of corporations and citizens, the role of the state, and conceptions of social justice (Capek 1993; Brown and Masterson-Allen 1994; Cable and Shriver 1995). Capek (1993) argues that, especially for black communities, the civil rights movement provided a “master frame” which legitimated the quest for environmental equality and permitted critical analysis of the social structure that created the inequity.

This new, broader perspective now dominates discourse on the causes of environmental inequity. As Heiman (1990) puts it, the Not In My BackYard perspective has become the Not In Anybody’s BackYard critique. When challenged as to where hazardous facilities should be located, rather than try to locate them in someone else’s backyard, environmental justice activists have responded by questioning the assumption that such facilities are a public good that must be sited somewhere. “The not-in-anybody’s-backyard stand forces the debate away from the suitability of specific waste treatment facilities of locations, and toward a more fundamental reassessment of the propriety of a production system under private control where, in the quest for profit, the public is exposed to known risks” (Heiman 1990, p. 361).

This new perspective was expressed in the *Principles of Environmental Justice*, a document created in 1991 by a group of activists at the People of Color Environmental Leadership Summit. Among the 17 principles adopted are these:

*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. 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. 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. (Reprinted in Hofrichter, 1993, pp.237–239)*

In searching for the causes of environmental inequity, many analysts—academics and activists alike—have come to see issues of environmental justice as a result of an inherent contradiction within the liberal democratic capitalist state (Cable and Benson 1993; Hamilton 1993; Heiman 1990; Krauss 1989; see also O’Connor 1973). The essence of this argument is that the state is charged with two conflicting goals: to further the accumulation of capital and profits for private industry; and to protect the interests of individual citizens and communities. Particularly in terms of environmental regulation, these two goals are at odds because environmental regulations protect citizens from industrial externalities at the expense of profits.

This line of reasoning is compatible with that of social ecologists and eco-Marxists. For example, Faber (1998) states:

*The roots of America’s ecological problems and injustices are grounded in the expansionary dynamics of the global capitalists system . . . . To sustain the process of capital accumulation and higher profits in the new global economy, American capital is increasingly relying on ecologically and socially unsustainable forms of production. . . . In so doing, America’s corporate ruling class, the 1 percent of the population that owns 60 percent of all corporate stock and business assets, is serving its own narrow material interests at the expense of the environment, communities, and the health of working people. The reason is that corporate expenses related to human health and environmental quality do not typically increase labor productivity (hence potential profits) sufficiently to outweigh such expenditures. . . . It costs capital and the state much less to displace environmental health problems onto people who lack health care*

*insurance, possess lower incomes and property values, and as unskilled or semiskilled laborers are more easily replaced if they become sick or die. In this sense, environmental inequalities in all forms, whether they be class, race, gender, or geographically based, are socially constructed features grounded in the systemic logic of capitalist accumulation. (pp. 2–5)*

The emergence of this theoretical model of environmental justice has inspired some writers to call for a restructuring of society and a return to basic principles of democracy. They reject the false contradiction between individuals rights and social goods. In particular, they are challenging corporate power and control over production decisions (Pullido 1994; O'Connor 1993; Hamilton 1993). They favor a new social contract with the state to create an economic democracy in which decision making is decentralized. For example, O'Connor (1993) states:

*For the people to regain their sovereignty and restore their environment, fundamental changes in the structure of government are required that permit effective discussion, debate, and decision making. Every citizen, regardless of wealth, should be given an equal opportunity to bring ideas to stop environmental decline directly to the American people. In addition, each citizen will need new rights, in relation to polluting or poisonous industries, in order to allow citizens an opportunity to protect themselves and their communities from the everyday abuses of economic power, against which no level of regulation or conventional governance can fully protect them. (p. 52)*

**Global Issues in Environmental Justice.** The global dimensions of environmental justice issues have been receiving increased attention. Third World environmental problems, particularly natural resource depletion, have generally been viewed by established international authorities (particularly the United Nations) as the result of insufficient development and a lack of advanced technology (World Commission on Environment and Development, 1987). Alternatively, however, critical scholars see Third World environmental problems as the legacy of colonialism and continuing exploitation of the periphery by core nations (Esteva 1992; Harvey 1997; Redclift 1987; Sachs 1997; Weissman 1993). Plans to promote development

in the Third World often involve large-scale construction projects (often funded by the World Bank) that cause large-scale destruction of natural resources such as forests, rivers, farmlands, or native species. Agyeman and Evans (1996) explain the situation this way:

*The well-entrenched belief endemic to Northern societies is that the extant economic and social conditions of many Southern societies legitimately permit commercial behaviour that would not be accepted in the North, often justified in terms of bringing employment to areas of no work. However, the implicit, unstated position is fundamentally racist, in that such commercial behaviour is deemed as appropriate for black people whereas it is inappropriate for white people. It is far away from the economic power centres of the North, and any local representations concerning pollution or environmental degradation are likely to be muted for fear of unemployment. (pp. 74–75)*

A case in point is the Union Carbide pesticide factory near Bhopal, India that released a cloud of poisonous gasses in 1984, killing an estimated 6,600 people and injuring as many as 600,000. Such a massive facility probably could never have been sited in a Northern country, and it would have required much more expensive safety measures.

The involvement of U.S. environmental groups in Third World environmental issues has been strongest in the protection of forests and natural habitat, and has generally involved mainstream environmental groups and other organizations dedicated to global justice and equity (Keifer and Benjamin, 1993). One popular intervention is the debt-for-nature swap, in which a Northern environmental group pays a portion of a Third World country's debt on the condition that the recipient nation will establish a nature preserve or other conservation program. These types of programs are increasingly resented by the nations of the South, who view them as paternalistic extensions of the North's colonial control that interfere with local self-determination. One alternative that has been developed is the debt-for-Indian-stewardship swap, in which indigenous people gain control over parcels of land in exchange for debt relief (Alston and Brown 1993).

The export of toxic waste to Third World nations has also become a major political issue. As the cost of disposal rises, facilities in the United States and Western Europe are increasingly looking for new locations to dispose of their wastes. For example, a ton of waste that costs \$200 to store in the United States will cost \$40 to dispose in Benin (Mpanya 1992). About half of all African nations have been approached by Western interests to serve as dump sites. At least 25 African nations have agreed, motivated by payments of \$10 to \$25 million that can be used to make payments on international debt. There have also been several rather widely publicized cases (and probably many undiscovered cases) where toxic waste has been imported into Third World countries under false pretenses, often labeled as fertilizer or construction material. For example, 4,000 tons of toxic incinerator ash from Philadelphia were unloaded on a beach in Haiti, falsely labeled as fertilizer. The attempt to repatriate the toxic ash has dragged on for years (Bruno, 1998).

The economic logic of these practices was revealed in a leaked internal World Bank memo, written in 1991 by then chief economist Lawrence Summers, which was subsequently published in *The Economist* (September 8, 1992). It reads in part:

*Just between you and me, shouldn't the World Bank be encouraging more migration of the dirty industries to the LDC's (Lesser-Developed-Countries)? I can think of three reasons: 1) The measurement of the costs of health-impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health-impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages. I think the economic logic behind dumping a load of toxic waste in the lowest-wage country is impeccable and we should face up to that. 2) The costs of pollution are likely to be non-linear as the initial increments of pollution probably have very low cost. I've always thought that underpopulated countries in Africa are vastly under-polluted; their (air pollution) is probably vastly inefficiently low compared to Los Angeles or Mexico City. Only the lamentable facts that so much pollution is generated by non-tradable industries (transport, electric generation) and that the unit transportation costs*

*of solid waste are so high prevent world welfare-enhancing trade in air pollution and waste. 3) The demand for a clean environment for aesthetic and health reasons is likely to have very high income elasticity. The concern over an agent that causes a one in a million change in the odds of prostate cancer is obviously going to be much higher in a country where people survive to get prostate cancer than in a country where under-5 mortality is 200 per thousand. Also, much of the concern over industrial atmosphere discharge is about visibility of particulates. These discharges may have little direct health impact. Clearly trade in goods that embody aesthetic pollution concerns could be welfare enhancing.*

In an attempt to address the problem of increasing toxic exports, the United Nations organized a convention held in Basel, Switzerland regarding the international movement of toxic waste. In 1989, 118 nations signed the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal. The Basel Convention prohibits the transfer of toxic wastes from member nations of the Organization for Economic Cooperation Development (OECD—an organization comprising the most industrialized and developed nations in the world) to non-OECD countries. However, many nations, including the United States, have yet to ratify the treaty and make it the law of the land. Furthermore, other international agreements, particularly international trade agreements such as the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT) actually make it more difficult for individual nations to restrict the flow of toxic substances across their borders, since such restrictions can present impediments to free trade.

## EMPIRICAL RESEARCH ON ENVIRONMENTAL EQUITY

**Research Findings.** For many environmental justice activists, the existence of inequitable environmental impacts along race and class lines is a reality. For sociologists and other scholars, however, the nature and extent of these inequities needs to be established through systematic and objective research. The protest against the Warren County landfill (described above) launched the current

interest in empirical investigation into claims of disproportionate siting of environmentally hazardous facilities in disadvantaged communities. One of the activists involved in the Warren County protest was Congressman Walter E. Fauntroy, who initiated a study by the General Accounting Office (GAO) of hazardous landfill siting in the South (GAO 1983). The GAO study, though limited in scope and analysis, found a relationship between the siting of landfills and the racial and economic characteristics of residents in surrounding communities. A more comprehensive study, also in response to the Warren County protest, was conducted by the Commission for Racial Justice of the United Church of Christ (United Church of Christ 1987). This study analyzed the presence of hazardous waste treatment, storage, and disposal facilities (TSDFs) in all zip codes in the United States, and concluded that racial composition was the strongest predictor of the presence of a TDSF. This study was circulated widely within the civil rights community and is considered to be the seminal investigation into racial bias in environmental risk. Interestingly, as Szasz and Mueser (1997) point out, the United Church of Christ analysis was not the first study of environmental justice. A number of investigations conducted in the 1970s, which focused more on social class than on race, had already found disparities in exposures to environmental risks, but these studies were largely ignored by the social science community. It took the politicizing force of the charge of racism to get scholars to take up serious investigation of the distribution of environmental hazards.

Since the United Church of Christ report, research on this topic has grown rapidly. Most studies, with some significant exceptions, have reported some type of social disparity in the distribution of environmental hazards. (See Szasz and Meuser 1997 for a comprehensive review of environmental justice research.) Higher levels of environmental hazards in places with lower socioeconomic status have been found by the United Church of Christ (1987), Burke (1993), Pollack and Vittas (1995), Been (1997), Boer et al. (1997), Brooks and Sethi (1997), Ringquist (1997), Kreig (1998), and Daniels and Friedman (1999). Similar findings for minority communities have been reported by the United Church of Christ (1987), Burke (1993), Zimmerman (1993), Perlin et al. (1995), Pollack

and Vittas (1995), Been (1997), Boer et al. (1997), Brooks and Sethi (1997), Ringquist (1997), Kreig (1998), Stretesky and Hogan (1998), and Daniels and Friedman (1999). Research by Anderton et al. (1994; 1997), Bowen et al. (1995), and Cutter et al. (1996), however, found no significant evidence of race or class disparity in the distribution of environmental hazards.

**Methodological Issues.** It is important to note that the studies mentioned above have used a variety of different research designs, and thus are not entirely comparable. For example, researchers have studied a wide range of geographic locations, ranging in size from the entire United States to a single metropolitan area, and results from one location may have little bearing on the situation in others. Furthermore, some of these differences in design point to important methodological issues that need to be considered in evaluating environmental equity.

One of the most important methodological issues involves the conceptualization and measurement of pollution. What constitutes a hazard? A wide variety of environmental risks have been discussed in the literature, including lead poisoning, pesticide exposure, toxic fish consumption, occupational hazards, nuclear facilities, municipal landfills, hazardous waste sites, and industrial emissions. Empirical research to date has most often used data on three types of hazards: hazardous waste treatment storage and disposal facilities (TSDFs) (United Church of Christ 1987; Anderton et al. 1994; Cutter et al. 1996; Been 1997; Boer et al. 1997); Superfund sites or other sites known to be contaminated with hazardous wastes (Anderton et al. 1997; Cutter et al. 1996; Kreig 1998; Stretesky and Hogan 1998; Zimmerman 1993); and data on industrial toxic releases from the EPA's Toxics Release Inventory (TRI) (Burke 1993; Bowen et al. 1995; Brooks and Sethi 1997; Daniels and Friedman 1999; Perlin et al. 1995; Pollack and Vittas 1995; Ringquist 1997). The focus on these particular environmental hazards stems partially from the seriousness of their potential impacts on human health, but it is also due to the simple fact that there are publicly available data for these hazards.

The extent of the risk posed by these forms of pollution is an important variable that sociologists have yet to fully address. Some researchers have

tried to take this issue into account by measuring the distance of resident populations from the hazard (Pollack and Vittas 1995), and others have included data on the toxicity of released chemicals in their analyses (Bowen et al. 1995). However, we still have relatively little information about exposure pathways and the risks to health that result from the environmental hazards under study. Epidemiologists, statisticians, and others have reported associations between the proximity of various environmental hazards and heightened morbidity and mortality (e.g., Geschwind et al. 1992; Kelsall 1997), but there are currently many more questions than answers about the mechanisms by which pollutants cause disease, the dose-response relationships involved, and potential synergistic effects (National Research Council 1991). These issues, although outside the domain of sociological inquiry, are highly relevant to the study of environmental equity, since adverse health outcomes lie at the core of citizen concerns about environmental contamination.

Another methodological issue involves a controversy in the literature concerning the appropriate geographic unit for the study of environmental equity. Some analysts have declared that, due to their smaller size, census tracts or block groups are more appropriate than zip codes, counties, or regions (Anderton et al. 1994; Bowen et al. 1995; Cutter et al. 1996). They suggest that findings of racial inequity such as that found in the United Church of Christ study are the result of an ecological fallacy resulting from the use of too large a geographic unit. Large units can mask significant heterogeneity in the distribution of residents, hazards, or both. Whether the ecological fallacy has played a role in findings of environmental inequity is still unresolved, as attempts to address the issue have been inconclusive. Bowen et al. (1995) claimed to compare two geographic levels in their study of environmental equity in Ohio, however, they analyzed first all counties in Ohio and then census tracts only in Cuyahoga County. Thus it is impossible to know if differences between the two levels were due to the unit of analysis or the area of study. Cutter et al. (1996) studied environmental justice in South Carolina at the county, tract, and block group levels. While they did observe that bivariate relationships changed significantly across geographic units, they found little evidence of

environmental inequity in South Carolina at any level, and thus no evidence of the ecological fallacy.

**Future Directions.** Evidence is mounting that disparities do exist in the distribution of environmental hazards according to race and class. But there is still much to know with regard to which groups of people are exposed to which hazards. As noted above, there are many types of environmental hazards and they may have very different distributions and impacts.

Perhaps the most significant question raised by this line of research is the question of process. How have disadvantaged communities come to be associated with greater environmental risks? Which came first—are hazardous facilities sited in already disadvantaged communities, or do poor and minority residents tend to settle near already existing facilities? This question is particularly significant because the answers may have important implications for policies intended to remedy inequities. Szasz and Meuser (1997) suggest six possible scenarios, ranging from overt discrimination in the siting process to market rationality. Most of the empirical research has been cross-sectional in design, and thus cannot address this important issue. One major barrier has been the lack of good historical data on environmental hazards. A few longitudinal studies have been conducted, but the results have been inconclusive (Been 1994; Been 1997; Oakes et al. 1996). Evidence about process from case studies of polluted communities, while perhaps not generalizable, suggests the operation of complex reciprocal processes (Hersch 1995; Hurley 1995). Traditional heavy industry in Pittsburgh, Pennsylvania and Gary, Indiana, for example, appears to have been located in places near raw materials and transportation. Initially, the lack of transportation meant that more-affluent white workers lived closer to the factories. Over time, a number of processes brought African Americans and poor whites into closer proximity to pollution. Improved transportation and affluence, combined with housing segregation, allowed middle-class whites to move away from the factories into new housing on the suburban fringe, while blacks moved into downtown locations. As the cities grew and environmental regulation increased, it became necessary to locate sites for the disposal of wastes. Affluent communities with more political clout were able to keep such facilities outside their

borders. Less advantaged communities were more vulnerable to the siting of waste facilities due to a lack of effective zoning regulations, a reluctance to protest anything that might bring jobs, and a lack of information about the types of facilities that were being proposed for construction.

This question of process points to the need to establish links between existing sociological theories and the issues raised by the environmental justice movement regarding the distribution of environmental impacts. What larger social forces have had a role in producing these outcomes? As noted above, some scholars have begun to link environmental inequities to general theories of capitalist production. In order to demonstrate the relevance of these ideas (or other theories, for that matter) to environmental justice, more specific mechanisms of inequity must be identified. Several factors have been suggested, including housing discrimination, the market dynamics of land values, occupational segregation, and procedural inequities in environmental regulation. Hopefully, future research will begin to address these challenging issues.

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GLYNIS DANIELS

## ENVIRONMENTAL SOCIOLOGY

Environmental sociology is a relatively new area of inquiry that emerged largely in response to increased societal recognition of the seriousness of environmental problems. Many areas of sociology have similarly arisen as a result of societal attention to problematic conditions, including poverty and inequality, racial and gender discrimination, and crime and delinquency. Environmental sociology is unique, however, in that sociological attention to environmental problems had to overcome strong disciplinary traditions that discouraged giving attention to nonsocial conditions such as environmental quality. Consequently, the growth of sociological work on environmental issues has been accompanied by a critique and reassessment of core sociological assumptions and practices, with the result that environmental sociology has a somewhat ambivalent stance toward its parent discipline.

We begin with a brief examination of the nature and evolution of environmental problems, in order to clarify the kinds of issues that are of concern to environmental sociologists. Then we describe the emergence of societal attention to environmental problems, highlighting sociological work on environmental activism and related topics. Next we describe sociology's response to the increased salience of environmental problems, including the development of environmental sociology as an area of inquiry as well as its critique of mainstream sociology's neglect of environmental issues. Then we review some important emphases of the field, including analyses of the causes of environmental problems, examinations of the social impacts of these problems, and analyses of

solutions to such problems. We end with a brief overview of recent trends and debates in the field.

## SOCIETAL-ENVIRONMENTAL INTERACTIONS AND THE EVOLUTION OF ENVIRONMENTAL PROBLEMS

*Environmental sociology* is typically defined as the study of relations between human societies and their physical environments or, more simply, "societal-environmental interactions" (Dunlap and Catton 1979). Such interactions include the ways in which humans influence the environment as well as the ways in which environmental conditions (often modified by human action) influence human affairs, plus the manner in which such interactions are socially construed and acted upon. The relevance of these interactions to sociology stems from the fact that human populations depend upon the biophysical environment for survival, and this in turn necessitates a closer look at the functions that the environment serves for human beings.

**Three Functions of the Environment.** The biophysical environment serves many essential functions for human populations, as it does for all other species (Daily 1997), but three basic types can be singled out. First, the environment provides us with the resources that are necessary for life, ranging from air and water to food to materials needed for shelter, transportation, and the vast range of economic goods we produce. Human ecologists thus view the environment as providing the "sustenance base" for human societies, and we can also think of it as a "supply depot." Some resources, such as forests, are potentially renewable while others, like fossil fuels, are nonrenewable or finite. When we use resources faster than the environment can supply them, even if they are potentially renewable (such as clean water), we create resource shortages or scarcities (Catton 1980).

Second, in the process of consuming resources humans, like all species, produce "waste" products; indeed, humans produce a far greater quantity and variety of waste products than do other species. The environment must serve as a "sink" or "waste repository" for these wastes, either absorbing or recycling them into useful or at least harmless substances (as when trees absorb carbon dioxide and return oxygen to the air). When land

# **The Power Plant Next Door: Indian Tribes Disproportionately Exposed to Energy Development**

The Associated Press

*(The Washington Post, July 4, 2012)*

Umoapa, Nevada — Beyond the ancestral hunting fields and the rows of small, sparse homes, the cemetery at the Moapa River Indian Reservation sprawls across a barren hill with the tombstones of tribal members who died young.

Their deaths haunt this small desert community outside Las Vegas. Children play indoors, afraid they might be next. Hoping to keep out the air they believe is killing their people, tribal elders keep their windows shut and avoid growing food on the land where their ancestors once found sustenance.

The Moapa Paiutes need not travel far to stare down their perceived enemy: The coal-powered plant blamed for polluting the southern Nevada reservation's air and water is visible from nearly every home.

"Everybody is sick," said Vicki Simmons, whose brother worked at the Reid Gardner Generating Station for 10 years before dying at age 31 with heart problems.

Across the country, a disproportionate number of power plants operate near or on tribal lands. NV Energy maintains its plant near the Moapa Paiute reservation is safe and has been upgraded with the required clean emissions technologies.

Meanwhile, local, state and federal health agencies say they cannot conduct accurate health studies to verify the tribe's complaints because the sample size would be too small.

In all, about 10 percent of all power plants operate within 20 miles of reservation land, according to an Associated Press analysis of data from the U.S. Environmental Protection Agency. Many of those 51 energy production centers are more than a half-century old and affect roughly 48 tribes living on 50 reservations. Fewer than 2 percent of all people in the United States identify as Native American and only a small portion live on tribal land.

In many cases, Native American leaders have long embraced energy development as an economic opportunity for communities battling widespread unemployment.

But a growing backlash has some tribal leaders questioning whether the health and environmental risks associated with energy production has put their people in harm's way. While it's not conclusive that coal operations pose a direct danger to reservation residents, the Moapa Paiutes are one of several tribes demanding the closure of their neighborhood power plants.

Sherry Smith, a history professor who co-edited the book *Indians and Energy: Exploitation and Opportunity in the American Southwest*, said hardly anyone paid attention or were aware of potential environmental consequences when the power plants were built decades ago.

"These are not simply people who have been duped by the government or the energy corporations," said Smith, director of the William P. Clements Center for Southwest Studies at Southern Methodist University in Texas. "They are simply 21st century people who are coping with the same issues the rest of us are about economic development and the environmental consequences and having to weigh these things."

Among the nation's 564 diverse tribal entities, energy production is widely debated. Many support environmental protections as a natural extension of American Indian values. But tribal leaders also aspire to protect their culture by keeping members on the reservation. Jobs and economic opportunity are necessary, energy production proponents say, and power plants fill the gap.

On one end of the spectrum is the Navajo Nation, the country's largest reservation, with five power plants near or on its sprawling territory in the Southwest. The tribe has embraced coal production as a central component of its economy, and Navajo officials traveled to Washington in June to oppose proposed EPA regulations to make the plants more environmentally sound. The new requirements would kill jobs, tribal leaders said.

On the other side of the debate have been members of tribes such as the Moapa Paiutes and the Northern Cheyenne of Montana, which for years

blamed local energy companies for the health woes plaguing residents on their reservations.

In Moapa, Yvette Chevalier said she became ill within weeks of moving last year to the reservation, which sits 2 miles from the decades-old coal plant that sometimes infuses nearby skies with gray fumes. Gary Lee said he recently lost 40 pounds because of health troubles.

Former Tribal Chairman Vernon Lee said it's not unusual for members to be hospitalized. "There have been a lot of heart attacks," Lee said. "Many young people died."

When coal is burned, carbon dioxide, sulfur dioxide, nitrogen oxides and mercury compounds are released into the air, according to the EPA. Research has shown those fine particles can be linked to serious health problems, including premature death.

Children, who breathe more often, and senior citizens, who tend to have health problems agitated by pollution, are particularly vulnerable, said Colleen McKaughan, an associate director in the EPA's air division.

In Montana, the Northern Cheyenne live near the state's largest coal-power plant, the Colstrip Steam Plant. The four-unit power plant operated by PPL Montana produces 2,200 megawatts of electricity and is one of the largest employers in eastern Montana with roughly 400 workers. Many in the tribe want it shut down.

In northeastern Utah, the Ute Indian Tribe has threatened to sue Deseret Power over pollution from its 30-year-old plant on the reservation, which generates 500-megawatts of electricity. Ozone readings in the region can reach nearly twice the limit considered safe by the EPA, especially during winter months.

"They are legitimately concerned about the impact the power plant has on the reservation," said Michael Harris, a lawyer representing the tribe.

Harris said some tribal members have complained of asthma attacks and cancer clusters and the plant might be to blame. Deseret Power did not respond to a request for comment.

To be sure, tribes fighting energy companies are the exceptions.

The massive Four Corners Steam Plant sits on Navajo land in Fruitland, N.M., where the Arizona Public Service Company says it generates 2,040 megawatts of electricity and serves New Mexico, Arizona, California and Texas.

Tribal members who work at the power plants earn roughly triple the average Navajo family income of about \$20,000 per year. The tribe expects to receive more than \$7 million annually from the two power plants on its land under its latest lease proposals.

"A lot of our own people who are critical of coal are not understanding the economic benefits," said Stephen Etsitty, executive director of the Navajo Nation Environmental Protection Agency. "It's easy to perceive a problem when you see a big power plant smoke stack ... but that often causes you not to look at other areas of concern."

In Moapa, Simmons—whose 31-year-old brother passed away after working at Reid Gardner Generating Station—can see the Nevada power plant from her kitchen window. It reminds her of her brother's death.

She also frets for her 24-year-old son, who works at the plant and comes home with ash-covered skin. His wife is pregnant with Simon's first grandchild.

"The land is poisoned," she said. "I don't even open my window because I don't like to look at it."