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Progress reports

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The growth of the environmental justice movement in the USA surprised even the most seasoned of policy-makers by its speed and the magnitude of its impact on USA national policy (Russell, 1989; Inhaber, 1990; Grossman, 1991; Goldman, 1992). Responding to intense public pressure from environmental and civil-rights activists for close to a decade, the USEPA established an Environmental Equity Workgroup in 1990. The workgroup had two primary tasks: 1) to evaluate the evidence that racial minority and low-income groups bore a disproportionate burden of environmental risks; and 2) to identify factors that contributed to different risk burdens and to suggest strategies for improvement. In 1992 their signature report was released (USEPA, 1992a), partially reaffirming earlier studies that found a strong correlation between the location of commercial hazardous-waste facilities in communities and the percentage of minority residents in those same communities. By February 1994, President Clinton signed Executive Order 12898, requiring every federal agency to achieve the principle of environmental justice by addressing and ameliorating the human health or environmental effects of the agency's programmes, policies and activities on minority and low-income populations in the US (Bullard, 1994a).

How much of the new policy is based on solid evidence of discrimination and how much is a direct response to the pressure-politics activist groups? This progress report reviews some of the recent literature on environmental equity and the empirical evidence supporting claims of environmental injustice in the USA. While the review focuses on the North American experience, the issue of environmental justice in other regions will intensify in the years to come as nations implement international accords for sustainable development.

I What is environmental justice?

A healthy environment is a basic right of all the Earth's inhabitants, a right reaffirmed by the Rio declaration (UN, 1992). Yet we know that environmental risks are unevenly distributed within and between societies, and we know that these risks affect populations differently. Inequities in risk exposure, risk reduction and risk compensation are crucial elements in contemporary management issues, so much so that the concepts of fairness

and equity are now regular components in decision-making for all remedial actions (National Academy of Engineering, 1986; Cutter, 1993).

1 Environmental equity versus environmental justice

Environmental equity is a broad term that is used to describe the disproportionate effects of environmental degradation on people and places. There are many ways to view environmental equity. For example, most of the social science literature examines either the causal mechanism of inequity or the spatial-temporal distribution of benefits and burdens (Greenberg, 1993; Kasperson, 1994). The former is referred to as process equity and the latter as outcome equity.

Environmental equity originates from three major sources of dissimilarity – social, generational, procedural. Social equity refers to the role of social and economic factors (class, race, gender, ethnicity, political power) in environmental degradation and resource consumption. The juxtaposition of economic activities, largely determined by locational criteria (property values, transportation access) and the social geography of places creates the landscape of risk. Classism, racism and sexism all contribute to social inequalities. Generational equity (Weiss, 1989; 1990) is a framework of legal norms to bring justice to future generations from current and past practices. In other words, public policy decisions are governed by the concept of fairness to future generations, so that our children and grandchildren will have the same access to resources and the same quality of life as we do. Generational equity ensures that society does not mortgage the environmental future for a present short-term economic gain. Procedural equity is the extent to which governmental rules and regulations, enforcement and international treaties and sanctions are applied in a nondiscriminatory way.

For many, the phrase 'environmental equity' implies an equal sharing of risk burdens, not an overall reduction in the burdens themselves (Lavelle, 1994). Environmental justice is a more politically charged term, one that connotes some remedial action to correct an injustice imposed on a specific group of people, mostly people of colour in the USA (Bullard, 1994b). The principle of environmental justice guarantees 1) the protection from environmental degradation; 2) prevention of adverse health impacts from deteriorating environmental conditions before the harm occurs, not afterwards; 3) mechanisms for assigning culpability and shifting the burden of proof of contamination to polluters not residents; and 4) redressing the impacts with targeted remedial action and resources. For aggrieved parties, environmental justice guarantees three basic rights: the right to information, the right to a hearing and the right to compensation (Capek, 1993).

2 Environmental justice according to whom?

The term environmental racism was coined in 1982 by Benjamin Chavis, then head of the United Church of Christ's Commission on Racial Justice (Mushak, 1993). He states:

> Environmental racism is racial discrimination in environmental policy-making and enforcement of regulations and laws, the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the presense of life threatening poisons and pollutants in communities of color, and the history of excluding people of color from leadership of the environmental movement (Chavis, 1994: xii).

Within the activist community, *environmental justice* is now the preferred term and the one that I will use. Environmental racism is part of a historical system of discriminatory exploitation, but is too restrictive a term for the current movement. Environmental justice,

on the other hand, moves beyond racism to include others (regardless of race or ethnicity) who are deprived of their environmental rights, such as women, children and the poor. Environmental justice is political action and social mobilization that marshals public and private commitment to change. By merging environmental, social equality and civil-rights movements into one potent political force, environmental justice advocates have considerable influence on public policy at all levels.

The environmental justice movement redefined and expanded the dominant environmental paradigm during the last decade and partially reduced the élitism that permeates modern environmental organizations and their causes. The shifting in focus from the 'white upper-class environmental rhetoric' surrounding the preservation of distant pristine habitats to a more localized strategy on environmental improvements in the quality of life closer to the homes of affected residents is one tangible outcome. For example, locally based activism against toxics now includes working-class people, inner-city residents and people of colour all working towards a cleaner and safer environment. Since the production of toxics and exposure to industrial hazards coincides with low income, working class and communities of colour, it is not unexpected that the toxics movement has its greatest success in urban areas. Politically, the Black Congressional Caucus has the best environmental voting record in Congress reflecting the plight of constituents who are victimized by poor environmental quality.

In theory, the principle of environmental justice means that we can no longer ignore who benefits and loses in the environmental game or in whose backyard the unwanted facility is located (Wenz, 1988). The increasing salience of environmental degradation to urban residents and people of colour means a broader-based constituency for action (Bullard and Wright, 1990), resulting in a new form of 'ecopopulism' (Szasz, 1994). For the USA, it means that the NIMBY (not-in-my-backyard) syndrome has been eclipsed by the BANANA (build absolutely nothing, anywhere, near anybody) syndrome (Knox, 1993). Unfortunately, this attitude and its political manifestation often result in the relocation of toxic industries from developed to developing countries, thereby continuing the patterns of environmental injustice only at a different spatial scale (Taliman, 1989).

II The environmental justice movement

By most accounts, the environmental justice movement began in 1982 in Warren County, North Carolina, when the state selected a site (Afton) to host a hazardous waste landfill containing 30 000 cubic yards of PCB-contaminated soil (Geiser and Waneck, 1983). Residents, mostly African-American, rural and poor, were joined in their protests by national civil-rights groups, environmental groups, clergy and members of the Black Congressional Caucus. Although unsuccessful in halting the landfill construction, the Warren County demonstrations marked the first time that African Americans mobilized a national broad-based coalition in response to an impending environmental threat. The Warren County demonstrations were the first of many community of colour struggles over toxic substances.

The publication of two studies, one by the government (USGAO, 1983), and the other by the United Church of Christ's Commission for Racial Justice (1987), galvanized the movement and provided some much-needed empirical support for the claims of environmental racism. Bullard's *Dumping in Dixie* (1990) added further empirical support for the disproportionate burden of toxic waste on minority communities.

In January 1990, the University of Michigan's School of Natural Resources sponsored a conference on race and the incidence of environmental hazards, bringing together scholar-activists interested in the issues and providing some national visibility to the debates on environmental equity (Bryant and Mohai, 1992). Later the same year, the USEPA established its Workgroup on Environmental Equity. By October 1991, the First National People of Color Environmental Leadership Summit took place, organized and attended by more than 650 grassroots and national leaders representing more than 300 environmental groups. Many of the delegates, participants and observers shared their experiences and early struggles and offered networking tips on surviving 'environmental sacrifice zones' (Bullard, 1994b).

By 1992, the USEPA formally established its Office of Environmental Equity and the Workgroup on Environmental Equity had finished its report (USEPA, 1992a). Critics of the report contend that EPA did not go far enough in examining its current activities, including its own role in re-enforcing environmental inequalities through its own decision-making procedures (Collins, 1993; Mohai, 1993; Roque, 1993).

Legislatively, a number of bills were introduced into Congress, most notably the Environmental Justic Act 1992, first sponsored by Senator Albert Gore (Tennessee) and Congressman John Lewis (Georgia). Individual states also introduced legislation to address environmental justice concerns, with Arkansas and Louisiana enacting the first environmental justice laws at the state level. Finally, President Clinton signed Executive Order 12898 (federal actions to address environmental justice in minority populations and low-income populations) into law on 11 February 1994.

III Proving environmental discrimination: outcome equity

The empirical evidence for environmental discrimination is mixed. The ambiguity in the research results is a consequence of four factors: 1) the environmental threat chosen for analysis; 2) the geographic scale or areal unit chosen for measurement; 3) the subpopulation selected; and 4) the time frame. For example, most of the recent empirical work examines hazardous waste and other toxic substances. During the 1970s, however, air pollution was the more thoroughly investigated environmental hazard (Mohai and Bryant, 1992a; 1992b).

Unfortunately, poor environmental quality is associated with economically depressed regions wherever they are located. Hall and Kerr (1991) illustrate this quite graphically in their *Green index* which maps the regional disparities in environmental quality. The environmental pillaging of the deep south is quite apparent with every state in the region (Louisiana, Mississippi, Alabama, South Carolina, Georgia) clustered at the bottom of the list on most of the 256 environmental indicators. Is it coincidental that these states also have the highest percentages of African-American residents as well?

As mentioned previously, the original USGAO (1983) study examined racial inequalities in communities surrounding four of the largest hazardous waste landfills in the south. Only four sites were selected (one in Alabama, two in South Carolina and the Warren County, NC, facility) and, of those four, three had a majority of African-American residents in the surrounding communities (e.g., 90% in the Alabama site, 38% in the Sumter County, SC site, 52% in the Chester County, SC site, and 66% in Warren County, NC, facility). While the study was the first of its kind, the statistical validity of the results is questionable. There is no way of comparing these sites to other places in the

country, nor to other communities without hazardous waste facilities within the region. Just how representative are these communities and the findings? Despite these problems, the USGAO study did point to a potential problem regarding race and the incidence of hazardous waste sites.

The other oft-cited study is the United Church of Christ's Commission for Racial Justice (1987). This study was more systematic, focusing on commercial hazardous waste facilities and uncontrolled waste sites as the environmental threats. Using a national sample based on the five-digit zip code, this study found that '. . . race proved to be the most significant among variables tested in association with the location of commercial hazardous waste facilities,' (UCC, 1987: xiii). In fact, communities with one or more commercial facilities had twice the percentage of minority residents than those communities without commercial hazardous waste facilities. They also found that three out of five African-American and Hispanic residents lived in communities with one or more uncontrolled toxic waste sites.

1 National perspectives

Recent research highlights additional ambiguities in the empirical support for environmental justice. In their investigation of the siting of hazardous waste treatment, storage and disposal facilities (TSD), Anderton *et al.* (1994) used census tracts within a national sample of metro areas (SMSA) as their areal unit for measurement. They found no statistically significant differences in the racial composition of tracts that contained TSD facilities and those that did not. When they changed scale (aggregating to large spatial units within a three-mile radius of the site or examining only the largest SMSAs), dramatically different results were produced. It was at the aggregation level that the association between race and TSD facilities location was most pronounced. Regional variations in the findings were also acknowledged.

The distribution of Superfund National Priority List (NPL) sites by county for the entire USA shows no statistical link between poorer counties and the number of Superfund sites (Hird, 1993). On the other hand, counties with NPL sites do have a slighter higher percentage of minority residents (holding other factors such as income constant). Another study (Zimmerman, 1993) also examined about 800 NPL sites in the process of being cleaned up. Locationally, Zimmerman found that racial and ethnic minorities were over-represented in communities (determined by minor civil-division designations) for sites in large urban areas, otherwise they are under-represented with respect to the national average. In looking at clean-up decisions, she found a more pronounced relationship between minority status and clean-up status with predominately African-American communities having relatively fewer remediation plans than other communities.

Greenberg (1993) conducted a national analysis of waste-to-energy facilities (WTEF) comparing the towns where the facilities were located and their service areas. In a series of tests he illustrated the effect of town size and facility capacity, geographic unit and subpopulations in determining outcome inequity. He found that '. . . inequity in the case of WTEFs depends not only on the geography of LULUs [locally unwanted land uses], but also the geography of the characteristic being tested for inequity (p. 235)'. Greenberg also found the strongest inequity was not based on income or race/ethnicity but on age. A disproportionate number of these facilities are located in communities with high percentages of elderly residents. In the same article he also provides a detailed case study of WTEF in New Jersey, where the results were also mixed.

Using a related measure for equity in incinerator-siting practices, Costner and Thornton (1990) found that the percentage of minorities in the USA communities with existing incinerators was 89% higher than the national average. In their analysis of the siting of new incinerators, Costner and Thornton found that the proposed host communities had minority populations 60% higher than the national average.

Finally, Lester *et al.* (1994) also produced ambiguous results. In examining a number of environmental stressors (nuclear sites, NPL sites, military sites, landfills, toxic air pollutants, etc.) by state, they found only slight support for the environmental racism hypothesis. This is largely a function of the scale (state-level) of their analysis.

2 State surveys

While there is some indication of environmental inequity at the national level, it is by no means definitive. What about at a more localized scale? Greenberg (1994) examined New Jersey's 113 NPL (Superfund sites) located in 90 municipalities in order to find out if priority ratings were associated with race and ethnicity. Using the federal Hazard Ranking System as a measure of severity, Greenberg found higher rankings were not associated with percentage of minority residents in municipalities; in fact, quite the opposite was true although these differences were not statistically significant. His primary explanation is that remediation (as a function of priority ratings) in New Jersey is driven by the threat to potable groundwater supplies. Most of the lower-income minority communities rely on surface-water drinking sources, hence NPL sites in these areas often result in lower priorities for clean-up. The question that was not asked, of course, is whether the federal HRS itself is equitable.

In another state-wide analysis, Cutter (1994) examined three risk indicators – number of acute airborne toxic releases, amount of toxic releases and amount of hazardous waste generated – for the 46 counties in South Carolina. Based on the geography of emissions, she found that the most affected residents lived in racially mixed, more urbanized counties with average incomes. In a more detailed analysis of South Carolina, Holm (1994) tested the correlation between location of hazardous treatment, storage and disposal (TSD) facilities and race and income. She used census tracts and block groups as her spatial unit. According to Holm, TSD facilities are clustered around urbanized areas with high population densities, but are not disproportionately located in minority or economically disadvantaged communities.

3 Local domains

In one of the first metro-level studies, Bullard (1983) found that solid waste sites were not randomly scattered throughout metoropolitan Houston, but were more often found in largely African-American neighbourhoods. According to Bullard, this 50-year pattern is a result of Houston's lack of zoning as well as the institutional racism that permeated the region.

In metropolitan Detroit, Mohai and Bryant (1992b) examined racial biases in the location of commercial hazardous waste facilities. The conclusion is that race is a better predictor of proximity to these sites than income. In fact, if you were a minority resident your chance was four times greater that you lived within a mile of a hazardous waste facility than if you were white.

Municipal solid-waste landfills and petrochemical plants are the environmental focus of

Adeola's (1994) study of the Baton Rouge metro area. Using self-reported measures of proximity and race based on a random sample of residents in the metro region, he found statistically significant results that race and proximity to the environmental threats were related. African-Americans were more likely to reside near hazardous waste facilities than other racial or ethnic groups.

Burke's (1993) analysis of toxic release inventory (TRI) sites in Los Angeles shows a clear relationship between minority percentage and number of facilities within census tracts. Her study found that the number of TRI facilities increased with higher percentages of minority residents, lower per capita incomes and lower population densities. Hispanics are the most disproportionately exposed subpopulation in Los Angeles. Although Burke found race, ethnicity and class important predictors, she could not conclude which of them had greater significance.

IV Threats to barrios, ghettos and reservations: process equity

Process equity, as distinguished from outcome equity, refers to some of the underlying causes of environmental inequities such as basic social inequalities, siting decisions, clean-up or differential enforcement of laws and regulations. The issue posing the greatest difficulty in environmental-justice research is which came first. Were the LULUs or sources of environmental threats sited in communities because they were poor, contained people of colour and/or were politically weak? Or were the LULUs originally placed in communities with little reference to race or economic status and, over time, the racial composition of the area changed as a result of white flight, depressed housing prices and a host of other social ills? In other words, did the residents come to the nuisance or was the nuisance imposed on them (voluntarily or involuntarily) (Jones, 1993; Mitchell, 1993)?

Little of the environmental-justice research examines causality except in very broad terms. For example, racism, economic inequality and economic segmentation are often cited as the root cause of environmental inequalities (Colquette and Robertson, 1991; Lazarus, 1993; Mitchell, 1993). Ong and Blumenberg (1993) describe in a very general way the environmental and occupational risks to Latinos in southern California, who bear a disproportionate share of exposures to industrial lead pollution, air pollution and hazardous waste sites. Gedicks (1993; 1994), on the other hand, places the cause on resource colonialism and multinational corporate greed, particularly as it affects indigenous peoples and their land. A recent example is the controversy surrounding the establishment of a private nuclear waste and storage facility on Apache territory in New Mexico. It should be noted that the facility is being actively sought by the Apache nation as a source of revenue. Unfortunately, none of these studies provides any empirical support for causality.

In his exposé of environmental change in Gary, Indiana, Hurley (1988) traces the historical demographic changes in that city over three decades. He found little correlation between particulate pollution and minority residents prior to 1950 but, since then, higher pollution levels were increasingly associated with poor minority areas of the city. Hurley suggests that increasing exposures were a function of increasing African-American migration into the city, into those areas where white resistance to integration was the lowest (primarily adjacent to industrial areas). He admits, however, that the causes of such migrations and locational decisions are not well understood.

In an attempt to address the 'which came first' question, Been (1994) examined

causality at the time of the siting decision. She examined the market dynamics and their influence in the disproportionate siting of LULUs and found that the role of market dynamics was uneven. To clarify further, Been re-examined the neighbourhood demographics at the time of the original siting of the LULUs in the USGAO (1983) and Bullard (1983) studies and traces these demographic changes over time. She found some evidence that the siting process was flawed and differentially affected minority residents in both studies. However, Been found no evidence that host communities became increasingly populated by minority residents, or that the landfills changed neighbourhood desirability. In the Bullard study, market dynamics did play a small role – property values and rents did decline and the percentage of minority residents increased as a result of the lack of opportunities to move elsewhere. Neither study is definitive and we are still left with the issue of which came first, the people of colour and/or the poor or the LULU.

Finally, a 1992 study by the *National Law Journal* (Lavelle and Coyle, 1992) examined the relationship between race and enforcement of environmental laws by the USEPA. They found that the USEPA discriminates against minority communities with respect to clean-up decisions and enforcement of existing environmental laws. In examining every environmental law suit from 1985 to 1991 and every residential NPL site (1777) since the Superfund programme came into existence (1980), the research found that financial penalties were around 500% higher for violations affecting predominately white communities as opposed to minority ones. Furthermore, it took 20% longer to get hazardous waste sites listed on the federal priority system for clean-up if those sites were located in communities of colour (Lavelle, 1994). Community income levels made no difference.

V Righting the wrong

Regardless of specific causality, there is substantial evidence that people of colour in the USA bear a disproportionate burden of environmental hazards. I suspect this is true in other nations as well. But what can be done about it?

1 Enforcement and regulation

A primary focus of the environmental-justice movement is differential enforcement of environmental protection statutes (USEPA, 1992b). The use of existing environmental laws to challenge construction and operating permits, siting decisions, discharge permit violations and underenforced environmental statutes such as the Lead Contamination Control Act is one strategy in a hierarchy of legal options (Brown, 1993; Chase, 1993; Lazarus, 1993; Cole, 1994). Community-based advocacy and representation (Cole, 1992) and land-use planning law (Collin, 1992) are two additional mechanisms that can be used to overcome decades of exclusionary zoning ordinances. The development of new legislation targeted to environmental-justice concerns such as the Environmental Justice Act 1992 (HR5326), the Environmental Equal Rights Act 1993 (HR1924) or the Environmental Risk Reduction Act (S2132) (Harding and Holdren, 1993) is another avenue.

2 Toxic torts and judicial remedies

Case law on environmental justice is sparse, but rapidly growing. It covers two areas: toxic torts and equal protection doctrines. The principal remedies for racial discrimination are

the equal protection clause of the Fourteenth Amendment and Section 1983 of the Civil Rights Act 1866. Under both statutes, the establishment of racial intent is required, a burden of proof that is hard to accomplish in environmental-justice claims. Illustrating the disparate impact of governmental action does not show racial animus and as such does not meet the 'intent' provision in case law (Godsil, 1991). Thus far, civil-rights law has not been an effective mechanism for achieving environmental justice nor is it likely to be as effective as environmental and public health laws (Cole, 1994).

Toxic torts are a more successful judicial remedy. In seeking monetary damages, people claim injuries to their health, property or environment as a result of criminal or negligent conduct or failure to act by an industrial firm. Increasingly, the courts are asked to resolve claims against industry by local residents or the federal government. Some have been successfully settled, others are more ubiquitous.

3 Grassroots activism

Another alternative is direct social change. Much of the social science literature examines the development of the people of colour grassroots environmental movements and their effectiveness in garnering social change (Brown and Mikkelsen, 1990; Heiman, 1990; Piller, 1991; Brown and Masterson-Allen, 1994) or mobilizing the black community for environmental justice (Bullard and Wright, 1990; 1992; Almeida, 1994; Bullard, 1993; 1994b). Still other studies simply foster awareness of the issues (Fitton *et al.*, 1993; Link, 1993) providing information, contacts and maps of affected communities (Goldman, 1991). The use of litigation, demonstrations, regulatory/zoning hearings, etc., are part and parcel of the bag of tricks local organizers can use (Austin and Schill, 1991). Because of the duality of the environmental-economic agenda, many groups argue for the right to a clean industry and the right to assist in pollution prevention policies as they affect the community (Austin and Schill, 1991).

VI The next step

The empirical claims for environmental racism are not definitive, as this review has shown. The debates currently underway are not about the salience of concern, but rather how do we define, classify and measure inequity (Zimmerman, 1994). Specifically, much more research is needed on what thresholds constitute an equity problem, what spatial unit is most appropriate for exploring equity issues and over what time frame. We obviously need better and more robust data to support inequity claims one way or the other, especially if those claims form the basis for litigation or public policy decisions. Geographers can make a major contribution to the formulation of equitable public policies by producing the methodological support for equity analyses. Scale is a central issue as I have shown, as is the ability to manipulate social and environmental data. Environmental equity is an inherently geographic problem yet we are noticeably absent from the literature. We need more involvement by our research community to insure that public policies are based on sound social science, not hyperbole. Only then can we truly ensure environmental justice for everyone.

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