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Issues and Potential Policies and Solutions for Environmental Justice: An Overview

Bunyan Bryant

The control over research becomes manifested by who funds what and for what purposes. Why is more research money spent on nuclear power than on solar and alternative forms of energy? Why is more research money spent on large corporate agribusiness than on improving the economic efficiency of the small family farm? Why is it that more money is spent upon designing highways than mass transit systems? Through the influence of money, powerful corporate interests determine the character of scientific inquiry more so than those without money; powerful interest groups are not only in the position to define the problem to be researched, but they are in a position to benefit directly from its results—results and breakthroughs to help them gain a greater share of the market or in the accumulation of profits. If welfare mothers were given 100 million dollars to spend on university research, the political economy of inquiry would be radically different from that of government and corporate decision-makers.

While money moves upward, pollution moves downward (Odum and Odum, 1976); communities of color and low-income groups get less than their fair share of money and more of their fair share of pollutants. Communities of color and low-income groups not only get more than their fair share of pollutants (Bryant and Mohai, 1992; Bullard, 1983, 1984, 1990, 1993; Bullard and Wright, 1986, 1987a, 1987b, 1991; Burke, 1993; Gelobter, 1986; Goldman, 1991; Higgins, 1993; Lavelle and Coyle, 1992; Mohai and Bryant, 1992a, 1992b, 1992c; United Church of Christ, Commission for Racial Justice, 1987; Goldman and Fitton, 1994; Wernette and Nieves, 1991), but the working poor in particular (the unemployed are often protected by Medicare) are most likely to be unprotected by health care insurance, to suffer more from toxic- induced or -aggravated diseases, and to spend higher proportions of their income on medical health care as compared with more affluent groups. Another way of saying it is that if medical bills were subtracted from the accumulation of wealth, there may be less wealth for the wealthy and potentially better health care for the poor. The accumulation of wealth is thus created at the expense of someone else's health or quality of life, or even death, even though scientists argue that the number of people at risk from toxic exposure

is very small. This struggle against toxic exposure resulting from the location of toxic and hazardous waste facilities in communities of color and low-income communities will undoubtedly increase in the future as the economy and by-products of production grow, and as more and more people become aware of the potential health effects of elevated levels of pollutants.

But there are those, mainly scientists and policymakers, who quickly point out that exposures are not necessarily linked to health effects. They maintain that people can be exposed to a variety of hazardous wastes or toxic substances and not suffer dire consequences. Until we can be sure of causality,[1] we will have a difficult time influencing policy; as professionals we would not be believable. The difficulty of proving causation is made clear in the following quote:

> The questions of what makes a given chemical dangerous to health and of why, how, and when dangerous chemicals may actually cause human illness are central to the matter of whether toxic waste sites such as Woburn's are the germs of a modern epidemic of environmentally induced disease. The waste sites that are toxic and potentially harmful are indisputable facts; more complicated is the matter of when and how this potential harm is unleashed to manifest itself in humans—whether in the form of rashes, nervousness, headaches, dizziness, nausea, birth defects or cancer. (DiPerna, 1985: 117)

Although we may not be able to prove causality due to confounding variables such as smoking, diet, indoor pollution, and synergistic and repeated effects of multiple exposures, this does not mean that cause and effect does not exist; it may mean only that we failed to prove it. Our inability to show causal relationships, which places us upon weak scientific ground, provides convenient opportunities for the paralysis of analysis; our inability to show causal relationships takes us down the slippery slope into a quagmire of confusion and entanglements and outright disagreements about levels of proof needed. At this point attempting to show causality, or that "A" causes "B," may be a no-win battle for most communities.

Given the complexities of causality, does the degree of risk to human health need to be statistically significant to require political action? Given the low numbers in cluster patterns (an apparent outbreak of disease clumped in time and space or both), do we need to show statistical significance, or should policy be based upon some other criteria? Given the complexities, should a 95 percent confidence level be adhered to for policy decisions? Should we err on the side of human health or on the side of conserving government resources? Given the complexities of causality, consistently debated in the academic community, should we just let people, most of whom are people of color and members of low-income groups, suffer and even die from toxic-induced and -aggravated diseases so that profits can be accumulated? Can we make policy decisions affecting the

health of people who are differentially exposed to environmental hazards and toxic substance in the absence of conclusive data? The answer to the last question is yes, we have always done it, but not without being paralyzed in our discussions. How many studies or levels of "proof" do we need before we act in the absence of certainty?

To date, causality arguments or issues of certainty are often used to rationalize inaction, particularly when it has been economically or politically expedient to do so. "To call for absolute certainty and agreement among scientists before taking preventive action is merely a delaying tactic, effective only to the extent that people believe the myth that certainty characterizes science" (Tesh, 1990: 69). It is ironic that lead poisoning, cited by the Agency for Toxic Substances and Disease Registry (ATSDR) as the number one health problem among inner-city children, causes mental retardation or impaired mental abilities. Government policymakers, known to demand causality, have in turn known about the negative effects of lead poisoning on human beings for over fifty years—in fact we have known about the effects of lead since the Roman times—yet the government has basically refused to rectify this situation in any meaningful way, even though millions of inner-city children may suffer from lead poisoning and thus irreversible mental retardation. Despite failed attempts to demonstrate that smoking cigarettes causes lung cancer, we, after a quarter of a century of debate and countless amounts of money spent on research and litigation, were able to enact a policy warning the public that cigarette smoking may be harmful to human health. Meanwhile millions of people had died or became victims of cancer. Why did it take so long for the government to make a policy to protect human health? The issue is not that the cost will not be paid; the issue is who will pay the cost—victims or industry and/or government.

Today countless people across the country live in fear of hazardous waste facilities, polluting industries, and legal and illegal dumpsites. Critical to this issue of hazardous waste is the concept of certainty. Clearly, people of color and low-income communities or more affluent neighborhoods do not want to be the recipients of uncertainty. Because many toxic pollutants are invisible and because the incubation period of toxic-induced disease may extend over a number of years, how can they be certain that they are being exposed to an invisible contaminant? How can they be certain if a contaminant, known to be present, is actually being absorbed by their bodies? How can they be certain about the amount of contaminants absorbed? How can they be certain if the absorbed dosage is dangerous to their health? To evaluate dangers of invisible contaminants may be impossible even if scientific instruments are used to detect their presence (Vyner, 1988). To adapt to uncertainty can cause physical and psychological trauma. The issue of certainty has not only torn communities apart, but it has torn relatives and friends apart; people once in close relationships are no longer speaking to one another, because while some chose to believe the government or the scientific establishment in the face of inclusive data, others chose not to. The enormous psychological impact of uncertainty is indicated by the following statement:

> There was a crisis situation with no specific reaction. There was no "grief" ritual. You don't know what to do. There are divergent emotions and reactions needed to cope. People prefer that this didn't happen. They can't see water pollution; they don't feel bad. They believe it, yet they can't cope, so they rationalize it. Even I had a point where I said, "Enough, I can't believe anymore." When the (neighbor's) child died, I reached my breaking point. I couldn't believe that he died from the water because I couldn't live here with the kids if I believed this. Other people shut off at the beginning. One person got an ulcer and the next didn't believe that there was anything wrong.... We didn't know what we were supposed to be doing! Are we paranoid, hypocritical crazies? (Comments from a community leader, Legler section of Jackson, New Jersey [Edelstein, 1982: 132; forwarded from Unger et al., 1992])

When immediate demands for certainty and solution are involved, the social and psychological impacts are not only evident, but so are the economic impacts. Housing stock, which is a life-long investment, begins to depreciate because few people want to buy in a neighborhood marked by conditions of uncertainty. In one working-class white community in Michigan, where a school was built on top of a landfill, a certain group of people chose to believe the school grounds were safe. Public knowledge of school ground contamination would depreciate the value of their land and housing stock, thus resulting in economic ruin.

While immediate demands for certainty and solution are characteristic of issue-oriented research, and while such research provides opportunities for community people to reclaim the democratic process, this has not been the case—i.e., for the most part. As more and more people make immediate demands, they will undoubtedly come in conflict with the well-established scientific community—a scientific community that feels threatened about democratizing scientific decision-making. Such decision-making may encroach upon their scientific domain of power and influence. Over the years, as the military, government, university, industrial, and scientific complex has become more powerful, so too have scientists. As scientists begin to obtain more answers to hypotheses through scientific methodology and the quantification of data, they will also continue to broaden their decision-making power, thus leaving communities of color and low-income groups marginalized with fewer democratic decision-making alternatives. This is clearly indicated in the quote below:

> The shift from politics to expertise changes the rules for exercising power, as well as the structure of effective power. The result may entail a cost in equity, since it can well be argued that those most disadvantaged will be the people at the bottom of the system—those who are, through lack of education and of technical sophistication, particularly ill-prepared to deal with the presentation of issues in a technical framework, and still more so when it comes to dealing with those who speak the language of maps, diagrams, and statistical tables. (Peattie, 1968: 81)

This statement was made almost thirty years ago, and we feel today that community people demonstrate not only a greater environmental awareness, but are generally better educated. Also, community people are motivated to learn quickly if a situation is life-threatening to them, their children, and future generations. Nevertheless, even though several national surveys have indicated that the general public has become more environmentally aware, scientists have been unwilling to engage communities in the democratic process to help them make informed decisions. They make assumptions about the "smartness" of community groups, whom they see as too emotional and thus too irrational to understand complex scientific issues. These assumptions provide the rationale for the scientific community to shift more and more of society's decision-making power away from the community to themselves. As more and more community groups demand to be a part of the decision-making process to deal with environmental crises, they will undoubtedly experience resistance from the scientific community, as the following quote indicates:

> ...many scientists, economists, and government officials have reached the dismaying conclusion that much of America's environmental programs have gone seriously awry...that in the last fifteen years environmental policy has too often evolved largely in reaction to popular panics, not in response to sound scientific analyses of which environmental hazards present the greatest risks. (Schneider, 1993: 1)

While science has made tremendous contributions to humanity and the world, such as enriched diets, reduced infectious disease, improved transportation, shorter and more efficient work weeks, more leisure time activities, and improved communications, it has not been without blemish. While on the whole science has been better than no science, it has to stand up to criticism. While science has offered us a vision of total control of our environment through the understanding of natural laws, we are finding that such control is impossible. To a large extent the seemingly foreboding social and environmental problems we experience today, either directly or indirectly, are the result of science and technology. What has been thought to be a long-term solution often ends up not being a solution at all, but another long-term problem (Commoner, 1976). We seldom know the true results of the "technological fix" until we have traveled down the road a piece only to find that it may be too late to reverse catastrophic damages. And yet it is often community groups or victims of environmental crises and their ways of knowing who direct scientists in the right direction for testing hypotheses.

To make assumptions about people's "smartness," their ability to deal with scientific certainty, and their ability to become constructive partners in the problem-solving process only adds fuel to the flame of community professional/technical conflict. The need for certainty may be a motivating factor for people of color and low-income groups to be a part of a democratic problem-solving process.

Freudenberg (1984: 446) presents a compelling argument of why community groups should be a part of scientific decision-making processes. He states that "the vast majority of groups (environmental, health, public interests, citizen action groups) interacted regularly with scientists (89 percent) and health professionals (73 percent). Scientific experts were most frequently identified by these groups as the most valuable source of information." In their consultation with professionals, these groups proved their sophisticated understanding of complex scientific issues, such as toxic site remediation and the limits of epidemiological studies, Freudenberg showed. In other instances community or nonprofessional people have shown their capability of participating constructively in research or problem-solving or planning endeavors (Brown, 1992; Brown and Tandon, 1983; Carr and Kemmis, 1983; DiPerna; 1985; Gaventa, 1991; Nitcher, 1984; Stapp and Mitchell, 1990). For example, community people in Rocky Flats, Colorado, were able to conduct health surveys which played a role in leading to a campaign against nuclear poisoning, and in Love Canal in Buffalo, New York, such surveys led to the cleanup of toxic waste sites (Gaventa, 1991). In Woburn, Massachusetts, Harvard-trained community people collected information to substantiate the hypothesis of a housewife that childhood leukemia was associated with the city's drinking water (Brown, 1992; DiPerna, 1985). In India, after lay researchers received training, they successfully collected data on health behavior important to health planners, as well as on the health concerns of the community (Nichter, 1984). In Appalachia, people were trained to collect information from county tax rolls to identify under-taxed properties of absentee landlords, which put pressure on the landlords to pay their fair share of the taxes supporting social services and fire and police protection. Stapp and Mitchell (1990) successfully trained students to measure water quality as a step in the long-term process of restoring the health of the Rouge River in the Detroit area. These are only a few examples of nonprofessional people taking charge or being intricately involved in research endeavors across the United States and the world. It by no means diminishes the importance of the role of professional researchers to acknowledge that laypeople have the resources and capability to do a lot more than many professionals admit.

To use the resources and capabilities of community people in the problem-solving process, and thus enhance their cooperation, assumptions about their lack of "smartness" need to be challenged; they must be perceived as smart, concerned, caring, serious enough about being engaged in the problem-solving process, and able to follow through on responsibilities. If these assumptions fail to change, or if citizens fail to be included in the decision-making process, then citizens groups will continue to use confrontation as a tactic or as a medium for demystifying expertise in order to transfer problems from the technical to the political arena (Nelkin, 1985). If the community is not meaningfully involved in the decision-making process, it will most likely thwart or frustrate any attempts of policymakers to implement policy decisions.

When the burden of proof is on the community to demonstrate certainty, policymakers often want to hold them to the rigors of traditional research. Yet when policymakers initiate siting and remediation decisions, they often fail to apply that same level of rigor for certainty as they do for community groups. In 1985, for example, William Ruckelshaus, having stepped down for the second time as the Administrator of the Environmental Protection Agency, and having resumed his career in the waste management industry, stated that: "We assume that we have greater knowledge than scientists actually possess and make decisions based on those assumptions" (Blumberg and Gottlieb, 1989: 104). Even when Ruckelshaus, policymakers, and scientists recognized that policy decisions are based upon incomplete data, the community of those most affected by uncertainty is seldom a part of that decision-making process. For example, as the importance of risk analysis is elevated in policymaking, the need for substantive input from concerned community groups often declines. Thus, the outcomes of risk-analysis are more likely to favor industry than community groups (Blumberg and Gottlieb, 1989). Both siting and cleanup decisions get masqueraded as decisions based upon science and political resistance often takes precedence over scientific rigor.

While the traditional notion of research tends to wed scientists to causality, and while the causality paradigm often fails to help us deal with the immediate demand of certainty and solution, we need to find ways of protecting people until certainty is known or immediate solutions are feasible; we can no longer afford the causality debate to consume and engulf us while millions of people suffer and die; we can no longer stand by in silence for profits to be made at the expense of people's health and their very lives; we can no longer stand by while our environment is poisoned and while nonhuman life is destroyed by corporate and individual greed. Traditional research prevents us from addressing pollution issues in a timely manner. The constellations of needs bequeathed by decades of environmental exploitation and racial oppression are now demanding immediate attention. The role of academics and professional organizers becomes critical in the face of uncertainty. When there is an immediate call to action by those most affected, it is necessary for us to act even though it may be professionally risky, and even if in some cases we may have to jettison the cause and effect research paradigm much more in the future than we do now.

While the production of chemicals may be useful to us in the short run, we do not always know the long-range effect or the long-term synergistic effects of these chemicals upon the environment and indeed upon our health. However, classical research paradigms are the backbone of academia, particularly with respect to satisfying the thirst of curiosity for the sake of knowing, or with respect to embarking upon scientific missions such as putting a person on the moon or exploring our solar system. Because both curiosity and mission-oriented researchers have more control over immediate factors regarding research, they can become proactive; they can, without pressures of responding to immediate demands,

design research projects more in accordance with the storybook model; they can generate their own hypotheses, test them, and publish their findings with fewer immediate demands. Yet, issue-oriented researchers often have less control over external factors because of immediate demands of community. Because issue-oriented research is often born out of crisis conditions, immediate demands place researchers in a reactive rather than a proactive position (Anderson, 1985). Researchers are thus at a disadvantage because of events beyond their control. While issue-oriented research is crisis driven, curiosity and mission research are more storybook driven.

The issue of certainty regarding the extent of human risk factors involved makes it difficult to find immediate solutions in time to save lives—sometimes thousands and even millions may become ill or even die before corrective answers can be found. Because of immediate demands for certainty and solution embodied in issue-oriented research, scientists often find themselves in a position of not knowing more than those most affected. As we grow and produce more toxic and hazardous waste, and as the potenial for issue-oriented research becomes more prevalent, we must make a paradigm shift in order to view community people most affected by environmental hazards as co-partners in research and problem-solving. This practice will lead to informed decisions based upon the best information available. Issue-oriented research will continue to profoundly alter the role of professionals who expect to make significant problem-solving contributions. The conflict between professional and scientific bureaucrats does raise some interesting questions, such as: What is the role of the scientist in issue-oriented research? What is the decision-making role of the public regarding issue-oriented research? Is there a balance between the utilization of scientific knowledge where decisions are made by professionals and the utilization of the democratic process where decisions are made by the people? Although these questions are beyond the scope of this book, they need to be answered if a working relationship is to be crafted between community people and professionals.

The Political Economy of Inquiry and the Crisis of Confidence

Although the common notion is that scientific inquiry is value-free and objective, "its relation to what it 'observes' is never unmediated: that is, the economic, political, and social environment in which people 'do' science and technology intervenes between cognition and its object" (Aronowitz, 1988:16). Scientists, like everyone else, bring presuppositions, values, and emotions to observation; they seldom stand apart from the world to view it dispassionately. While scientific inquiry is never carried out in a vacuum, the pretense of ethical neutrality gives such inquiry its legitimacy; it allows knowledge to be treated as a commodity (Dickerson, 1984) to be purchased by the highest bidder. While scientists are concerned about maintaining their professional autonomy and

freedom, they nonetheless succumb to social controls of powerful forces to use science in a discourse to narrate a certain political and economic reality. The requirements posed by powerful interest groups become the basis of a fundamental critique of scientific inquiry and technology; they are not neutral instruments separable from the context in which they occur.

The control over research becomes manifested by who funds what and for what purposes. Why is more research money spent on nuclear power than on solar and alternative forms of energy? Why is more research money spent on large corporate agribusiness than on improving the economic efficiency of the small family farm? Why is it that more money is spent upon designing highways than mass transit systems? Through the influence of money, powerful corporate interests determine the character of scientific inquiry more so than those without money; powerful interest groups are not only in the position to define the problem to be researched, but they are in a position to benefit directly from its results—results and breakthroughs to help them gain a greater share of the market or in the accumulation of profits. If welfare mothers were given 100 million dollars to spend on university research, the political economy of inquiry would be radically different from that of government and corporate decision-makers.

Because the majority of grassroots organizations seldom have equal access to prestigious universities for their research interests, they must force temporary and sporadic changes in the political economy of inquiry by taking to the streets or to the political arena (e.g., Agent Orange, AIDS, and toxic and hazardous waste). Through protest they educate the general public to broaden the sphere of influence by attracting large numbers of people to lend emotional and political support to their issue, and thereby move the government from indifference to allocating research money for science and technology as defined by activists. These successes have required incredible amounts of resources and political pressure on decision-makers in order to make them accountable. Because it is difficult for community people to define the research agenda, and because they have to take to the streets to publicize their issues, they find themselves growing more angry and more distrustful of government and institutions of higher learning—a distrust that has grown since the 1960s. While the political economy of scientific inquiry has resulted in mounting profits, people of color and low-income groups have often lost confidence in both government and universities; they feel the political economy of inquiry is bent toward resolving profitability problems of corporations—corporations that are already notorious for failing to pay their fair share of taxes or for being up to their necks in scandals. Communities often feel that institutions of higher learning could spend more time solving public health and safety problems. They have lost confidence in government and corporations because of cost overruns on government contracts that number into billions of dollars. They have lost confidence because the concentration of wealth continues to increase in this country, and because too many people are unemployed or

underemployed, and because too many people go malnourished and live in deplorable conditions. They feel, correctly or not, that institutions of higher learning and government regulatory and scientific agencies have not responded to their call for toxic cleanups or research; they often feel they live in sacrifice areas for toxic and hazardous waste. Because professionals are an integral part of the political economy of inquiry, their role has been questioned both as researchers and as practitioners (Becker, 1967; Brown, 1992; Chambers, 1983; Cloward and Piven, 1975; Freidson, 1971; Funnye, 1970; Gouldner, 1968; Haug and Sussman, 1969; Mitroff, 1974; Wolf, 1970). To receive tenure, faculty tend to ask research questions that lead to tenure and not necessarily to find helpful answers for community groups living in polluted areas. A colleague of mine jokingly made this statement at a recent conference. But joking aside, the statement may have merit in that community groups in particular often feel that research done by scholars has been less than helpful. Even though this may be a misperception, people often behave as if perceptions were in fact real.

Often research findings and health care policies assign blame for sickness at the individual rather than the institutional level.[2] Health care policies are intended to help people make the right choices in order to live healthy lives despite the fact that they may live in contaminated communities. Disseminating information for people to make informed health care choices is part of the rugged individualism that grew out of the pioneering spirit of this country. The ideology of individualism blames the victims—not the polluting institutions. If a person becomes ill, it is because they made bad choices or failed to take care of themselves. The ideology of individualism not only blames victims for their toxic-induced and -aggravated illnesses, but also keeps people from confronting institutions that may have created the condition for their illness in the first place. To require industry to cleanup its act or to practice pollution prevention strategies would cost corporations billions of dollars. Individualism is at the heart of pollution control policies.

Let me explain why. This country has a population of about 230 million people. Let us say that with pollution control technology 1 in 10,000 people a year will die or get sick because of a given toxin—about 23,000 people a year. But what is implied in this country is that there is something inherently wrong with the 23,000 individuals who became ill or died, suggesting that their deaths were their own fault, or that they were inherently too weak to survive exposure to toxins. But if the companies stopped producing toxic substances, there would most likely be a substantial reduction in morbidity and mortality rates. How does this relate to the political economy of inquiry? If most research dollars go to inquiries about pollution control, this will require industry to make few changes in production by adding pollution control technology, and thus protect their profits, even at the expense of people's health. If most research dollars, on the other hand, were allocated to pollution prevention, industry would have to spend a considerable amount of money gearing up to use nontoxic materials and technologies, thus

cutting into their profits. We can expect concerted resistance to the latter alternative even if pollution prevention saves thousands of lives. In more subtle forms the political economy of inquiry becomes evident in the following analysis of two questions: "Will I get sick if this stuff is in the air?" sounds like a value-free question. On the other hand, "Should this stuff be in the air?" appears political. But the first question is as political as the second; it just hides its acquiescence to the status quo (Tesh, 1990:162-63). Those who ask questions that support individualism are often viewed as scientific researchers. While those who ask questions about institutions are often viewed as political or even extremists.

Although there will always be interest groups competing for or buying resources from universities, universities can do a better job in granting access to community groups in order to help them solve critical research questions in the surrounding community. To do this will require that universities change their reward system, such as tenure, promotion, and merit structure, to encourage faculty to become more involved in solving local community social and environmental problems. Although some research of this kind is done, it pales in relation to what is done for powerful outside interest groups. We also feel universities should do more to embrace alternative research methodologies in order to satisfy other research interests as well. There are different and valid ways of knowing that should be highly cherished within the university.

To solve environmental justice problems we need professionals to work not only across disciplines to solve environmental justice problems, but also with community groups; we need them to interact with community groups with the assumption that they are "smart" and knowledgeable about environmental hazards affecting their lives; we need them to view community groups as allies rather than adversaries in working to solve environmental problems; we need them to stake their claim to the community rather than to the whims of powerful interest groups. This will require researchers to: "(a) discard the scholar's arrogance, learn to listen to discourses conducted in different cultural syntax, and assume the humility of those who really wish to learn and discover; (b) break the asymmetry of the relations generally imposed between interviewer and interviewees in order to exploit the latter's knowledge; and (c) to incorporate people at the base as active and thinking individuals in their self-investigation" (Fals-Borda et al., 1982: 36). Although our professional training goes against the first requirement, we must nonetheless take on the challenge of finding new ways of relating to and involving laypeople in what is often life-or-death research.

Similarly more and more community groups should keep professionals honest by making them accountable. One of the best ways to hold professionals accountable is for community groups to become informed enough to challenge them on the issues; wherever possible, citizens should question professional researchers by consulting other professionals with different opinions and by consulting their own knowledge. The role of both the university and the professional is critical if we

expect to provide meaningful solutions, even if it means going against well-established university and professional conventions

General Cleanup Policies: The Issue of Certainty and the Immediacy of Solution

The debate on causality and the role of universities, professionals, and grassroots activists is an interesting one that needs to continue, but not at the expense of action against pollution or at the expense of people's health or their very lives. Grassroots activists, having lost patience with agencies for not responding to their concerns, have demanded that these agencies respond to environmental health needs. The frequent inability of scientists or policymakers to respond to high risk populations demand for certainty and immediate solutions regarding contaminated air, water, and land only adds to their frustrations and oftentimes anger. Today communities across the country are faced with an environmental crisis that stems from contaminated landfills, incinerators, and polluting industries. As crises become more numerous, we can expect community groups to use confrontation as a means of communicating their deeply felt concerns about environmental risks and exposures. We can expect them to communicate risks from a position of power. Decision makers often listen from a position of power—not from a position of weakness. Krimsky and Plough (1988: 2) put it most aptly when they state that "citizen groups, less concerned about formal theories, have become increasingly aware that getting a message across to government in disputes over health and environmental hazards is essentially a political activity." Risk communication becomes more than just a research agenda, but a political one, as people or special interest groups organize to exercise power to satisfy immediate demands. To deal with immediate environmental crises, we need effective policy guidelines. The formulation of those guidelines should grow out of participatory research, where professional/technical people work collaboratively with community activists on various projects.

Both professional and community activists should attempt to break from the confines of the traditional research paradigm of causality, the scientific backbone of certainty, even if it calls forth consternation and ridicule from the professionals' colleagues. In many cases both laypeople and professionals have good hunches about where to start the clean-up process based upon laboratory tests and chemicals known to be carcinogens. To sidestep the argument of cause and effect requires us to cleanup contaminated areas (particularly where we observe the presence of certain toxic chemicals and patterns of illnesses), until the effect becomes oblivious or nonexistent. If the effect disappears, then we know we have probably dealt with the cause, even though we may never be certain of the specific cause. If environmental justice is to prevail, public policy must be based upon prudence and the outcome of citizen participation and/or participatory research, and not neces-

sarily upon the traditional scientific research paradigm. More and more public policy will have to be based upon judgments of what is just and fair.

But isn't that expensive? Yes, but so are the lives of those most affected. Cleaning up our cities would create jobs ranging from recycling materials and waste, which created 14,000 jobs in California alone (see Bezdek, chapter 7) to cleanup of Superfund sites. Rebuilding roads, bridges, housing stock, schools, public buildings, parks and recreational facilities, public transit systems, water supply systems, waste-water treatment, and water disposal systems are all possible and much needed. While some feel that rebuilding inner-city infrastructures will make us more competitive on the global market, others feel that it is necessary for sustainable development and the survival of our urban areas. Such jobs would be consistent with President Clinton's National Service Program in which over 150,000 students may participate, many of whom can devote time for environmental cleanup. Such jobs are consistent with the highly successful Detroit Summer Program, where, in the spirit of the students who went south to work in the civil rights movement, students are asked to come to Detroit to help cleanup and refurbish housing stock and participate in other neighborhood projects. Although this does not make for "good science" in the traditional sense, it may reduce both the number of exposures and risks, and simultaneously provide jobs. Since our communities are long overdue to be refurbished, we need to spend money to cleanup and rebuild our cities across the nation to make them more livable and nurturing. The alternative is to spend untold billions of dollars on toxic-induced and -aggravated diseases, while also losing billions of dollars on depreciated land values, housing stock, and worker absenteeism. This is an expense our country can no longer afford.

Recycling, Reduction, and Reusing (3Rs) Policies and Issues of Certainty

Despite the fact that establishing causality may be viewed as the best way to make policy decisions, many environmentalists refuse to wait until scientific certainty has been established. They have taken action by organizing and setting up successful recycling programs in cities throughout the country; they have been fairly successful in making people aware of the need to conserve energy and to reduce their wastestream. While recycling, reduction, and reusing (3Rs) policies have been relatively successful in getting people to alter their wastestream from landfilling and incinerating, this process has become part of a pollution-prevention policy—a policy that positions itself between production and final incineration and/or landfilling. It attempts to get people to curtail their wastestream by encouraging the 3Rs of products and materials. Although these strategies are popular among environmentalists, they are also becoming popular among communities of color; waste reduction may take the pressure off building new incinerators or landfills in communities of color or low-income neighborhoods. The 3Rs are

driven by at least three major forces: First, between 1950 and 1975 six billion tons of hazardous waste have been deposited on or under land throughout the United States. The EPA estimates that there are about 26,000 sites where hazardous material was dumped before the passage of present laws to regulate their disposal. Each year more than 292 million tons of hazardous waste is produced in the United States, an average of 1.1 ton for each person in the country (Miller, 1988). The production of such large amounts of waste at such an alarming rate has reached epidemic proportions. Where do we dispose of it? Second, population growth and a corresponding rise in consumerism increase the average use of nonrenewable and renewable resources per person. While the average resource-use per person in affluent countries is expected to rise sharply in the coming decades, developing countries are hoping to become more affluent too. With this fast rate of growth and development, scientists are predicting worldwide shortages of resources. To stem the tide of resource consumption, recycling, reusing, and reduction seem to be a feasible strategy. And third, there is the assumption that if we pollute less by using the 3Rs, then we will do less damage to the environment and thus less to ourselves. Perhaps there will be less morbidity and mortality. In addition, post-production recycling strategies would provide a number of jobs for people and thus help an ailing economy.

Pollution Prevention Policies and Issues of Certainty

Of the two policies mentioned above, none is as effective as pollution prevention. The best way to deal with immediate demands of certainty and solution is for both professionals and community activists to emphasize the prevention of fugitive emissions that are dangerous, fat-soluble, and persistent. Barring toxic substances from the production process would provide certainty that neighborhoods would be safer. These harmful substances include many of the organochlorines, 11,000 of which are now used in the commercial sector; some of them have been banned or severely restricted, such as DDT, PCBs, chlordane, mirex, dieldrin, heptachlor, and chlorofluorocarbons (Thorton, 1991). Even if we could reduce the escape of these harmful chemicals in smokestacks by 99 to 100 percent through incineration, which is almost impossible to do economically, the continued by-production of bottom and fly ash would still present a danger to health through increased concentration of those toxic wastes. Millions of tons of ash each year would still find their way into the air or potentially leaky landfills even if we used the best available technology. Many of these landfills or ashfills may become Superfund sites for the next generation

But prevention strategies of certainty—i.e., of using nontoxic materials in the production cycle—may place communities of color and low-income groups on a collision course with professions that are wedded to risk management, risk assessment, and other pollution control strategies. Pollution control strategies, backed by the professional/technical class more so than grassroots activists, are

Table 1.1. Significant Improvements in U.S. Pollution Levels Emissions

Pollutant	Time Period	Change	Remedial Measure
Lead emissions[a]	1975–80	–95%	Removed from gasoline
DDT in body fat[b]	1970–83	–79	Agricultural use banned
PCB in body fat[b]	1970–80	–75[c]	Production banned
Mercury in lakes[b]	1970–79	–80	Replaced in chlorine production
Strontium 90 in milk[b]	1964–84	–92	Cessation of atmospheric nuclear tests
Phosphate in milk[b]	1971–81	–70	Replaced in detergent formulation

Source: Environmental Quality, 22nd Annual Report, The Council on Environmental Quality (forwarded from Commoner, 1992). This table does not include the thousands of toxic chemicals that have not been banned or removed.

[a]Measured as amount emitted per year.

[b]Measured as concentration.

[c]Changes in percentage of people with PCB body fat levels greater than 3 ppm.

limited in their corrective effects. The basic task of pollution abatement and control devices is to progressively reduce concentrations of fugitive emissions as they pass through technological systems that extract or destroy them. If systems can remove 90 percent of pollutants, then how much monetary resources would it take to make technological systems efficient enough to remove 99.9 percent of the fugitive. emissions? The limitation is that to go from 90 percent efficiency to 99.9 percent efficiency raises costs exponentially, thus cutting into profits to an extent that companies say that it is not worth the cost to go the last mile. As pollution controls are made more efficient and as their cost escalates, further environmental protection is blocked. But reduction of emissions by even 90 percent is not good enough because it fails to eliminate the bioaccumulative effects of certain pollutants that are dangerous, persistent, and fat-soluble, particularly as they move up the food chain and cause major health problems (Commoner, 1992).

Citizens groups and public opinion, more than professional/technical people, have embraced pollution prevention strategies and have demanded that DDT and PCBs be banned. Similarly, phosphate became a target of public concern over eutrophication. Due to the outcries of children organized by the Citizens Clearinghouse on Hazardous Waste, McDonalds abandoned the use of polystyrene ware to package food; the widespread boycott of apples caused Uniroyal to discontinue the use of the insecticide Alar; a number of incinerators have been closed in favor of

recycling centers as a result of strong local opposition; public concern about strontium 90 eventually played an important role in the passage of the Nuclear Test Ban Treaty between the United States and the former USSR (Commoner, 1992). It is interesting to note that many of the pollution prevention strategies came to the public's attention as a result of community activism rather than scientific recommendations. Emphasizing pollution prevention strategies basically eliminates the causality argument.

An emphasis on prevention, however, will require considerable economic change in this country; it will cost industries, particularly the chemical industry, billions of dollars. To recoup their monetary loses, chemical firms should be supported by federal aid to help them make the economic transition from producing and using chemicals such as the organochlorines to producing more environmentally benign chemicals. Other industries will not be hit as hard economically in making this transition, but they will also need support for an economic transition on a scale our country has never seen. And since the world is relatively free of the destructive competition between the former Soviet Union and the United States, this economic transition we have embarked upon can be seen as the peace-time conversion we so badly need to get this country on track and moving forward again. Undoubtedly, some critics will disagree with this proposal. They believe that the chemical industries, having made billions of dollars, should be left to fend for themselves. But it is unrealistic for them to do so given the order of magnitude of change we are asking them to make.

Toward Conclusive Policies and Solutions for Environmental Justice

Thus far the discussion has been on the issue of causality and immediate demands for certainty and solutions to environmental crises. Critical to the discussion have been general cleanup strategies, the 3Rs, and pollution prevention. We now turn to a more comprehensive discussion of environmental justice. This discussion is necessary if we expect to reverse the perilous trend of environmental destruction and the disproportionate impact of environmental hazards on low-income people and people of color. This discussion is necessary, too, if we are serious about crafting new policies to ensure that environmental justice will be served. What is meant here by "environmental justice?" We define environmental justice as those institutional policies, decisions, and cultural behaviors that support sustainable development, that support living conditions in which people can have confidence that their environment is safe, nurturing, and productive, and that support communities where distributive justice prevails. Distributive justice is important because the market system gives rise to both the organization of American society and the unequal distribution of wealth and patterns of toxic exposure and disease.

Because the market system gives rise to the organization of American society and its distribution patterns, microbes and viruses may be the last agents—not the first—to examine for causality. The first place to look is at the social structure in which wealth is accumulated. If the social root of health and disease is the way society is organized, then community cleanup, pollution control, and preventive measures are only temporary stopgaps. If we want to deal effectively with health risks and exposures, we must also deal with the structural components of poverty and racism.

The current movement in minority communities is focused on environmental issues and distributive justice—justice that addresses decent and safe jobs, decent housing, decent schools, and decent and safe neighborhoods. While social and political movements have basically failed to make environmental connections, the mainstream environmental movement has failed to make social connections with oppressed groups. The environmental justice movement, however, brings together the social, economic, political, and biophysical connections in ways that are unprecedented in this country. This movement has begun to profoundly affect the way we think, behave, and govern ourselves.

To make environmental justice a reality, we need to focus on several comprehensive policies to help eradicate poverty, racism, and disease. While these policies may overlap with one another, they are listed separately to emphasize their importance. We can begin the process by launching a national health care program.

National Health Care Policy

Unless we have an effective national health care policy, we cannot achieve environmental justice. Because thousands of new chemicals enter the market each year—and eventually enter the air, water, and soil—those who already suffer disproportionately from noxious pollutants will probably suffer more and/or in greater numbers. It is shameful that 38 million Americans lack health insurance. We hypothesize that a considerable number of them live in places that make them vulnerable to disproportionate amounts of toxic waste. They may suffer in greater percentages to toxic-induced and -aggravated diseases than those living far away from polluted sites. Therefore it stands to reason that those exposed to greater numbers or higher levels of toxic or hazardous waste should have health care protection. Not providing medical treatment to those who have no insurance may, in the long run, be even more expensive than guaranteeing treatment to all. What could have been a simple and relatively inexpensive treatment at the outset could triple or quadruple in costs because of the progressive worsening of the disease. To continue without a national health care program that protects all citizens equally against want and need is not sound economic policy. Even though special interest groups will resist a single payer national health care program sponsored by the federal government, such a program is more likely to provide better protection for the majority of people in this country than any other system. To bring health care costs under control would also benefit our economy. Government or industrial policies should no longer force people of color and low-income groups to subsidize growth and development by burdening them with exorbitant medical health care costs.

A National Energy Policy

To address environmental justice we need an effective energy policy. The amount of energy we waste in this society is staggering. And as long as we are dependent upon sources of energy from other nations, we must also depend upon military might to defend international corridors for the safe transport of energy supplies. We run the risk of losing the lives of thousands of young men, with people of color experiencing a higher percentage of casualties than their white counterparts. We can prevent the likelihood of killing fields by becoming less dependent on foreign sources of energy and by conserving our own. Hayes (1976: 7) stated that "we annually consume more than twice as much fuel as we need to maintain our standard of living. We could lead lives rich, healthy, and fulfilling—with much comfort and with more employment—using less than half the energy now used." It is ironic that during the Great Depression and World War II, our country had innovative and successful conservation and recycling programs that saved money and created jobs. But following the war, we became a throwaway society—not a conserving society. We refused to heed Rachel Carson's (1960) warning, in *Silent Spring*, about the harmful effects of chemicals and Vance Packard's (1960) warning, in *The Waste Makers*, where he describes our wastefulness as a society.

Through improved energy conservation we could not only become less dependent on international energy supplies but we could create more jobs. In fact, evidence suggests that a sustainable energy economy based upon alternative sources of energy would produce more jobs than one based on nuclear power or fossils fuels (Flavin and Lenssen, 1990; Grossman and Daneker, 1977; Hayes, 1976; Jordan, 1978; Lovins, 1976). Flavin and Lenssen (1990: 41) report that a study in Alaska found that "weatherization created more jobs and personal income per dollar than any other investment, including the construction of hospitals, highways, hydroelectric projects." Weatherization alone could create a number of different jobs for workers, carpenters, sheet metal workers, and others. The solar industry will need photovoltaic engineers, solar architects, plumbers, and carpenters. Also a vast number of jobs will come from recycling, recovering, reusing, and reducing our wastestream. Although the jobs may be numerous, we need to make sure that they are safe and decent paying ones.

A National Environmental Education Policy

To eradicate environmental illiteracy, we need an effective environmental education program. Although more Americans are becoming aware of environmental problems, the majority remain environmentally illiterate. We need environ-

mental education programs in every public school from K through 12th grade. Through our schools, churches, and programs such as Boy Scouts, Girl Scouts, and Boys Clubs, we need to provide environmental educational programs to enhance people's knowledge of their surroundings and to help them become environmentally effective citizens. To launch policies that support sustainable communities where distributive justice prevails requires an environmentally educated citizen—a citizen who understands the importance of, and connection between, our environment and our social, economic, and political institutions. An environmentally educated citizen is a prerequisite for social and environmental change. As people become more environmentally literate, they may be in better position to protect themselves against toxic chemicals and live healthier lives.

A Policy for Sovereignty for Indigenous People

Over the years, in fact ever since the inception of this country, Indigenous people have been exploited for their resources and their land. Even now the lands of indigenous people are being sought after because many reservations contain coal, oil, and uranium as well as timber and other mineral resources. In other instances, Indigenous people must struggle to maintain fishing rights guaranteed them by treaty. Today indigenous people control only a fraction of the land and resources they did at the time of first contact with Europeans. The lack of control of their land relegates them to a state of dependency, leaving them unable to solve rampant unemployment, poverty, and attendant social problems. To address environmental justice also requires us to address sovereignty issues of Indigenous people. This issue will not go away; Indigenous people have been unjustly wronged and deserve a redress of their grievances; they want control over their land in order to make decisions affecting their lives, their culture, and their natural resources. The U.S. government has signed more than 400 treaties with Indigenous people, all of which have been broken (Zinn, 1980: 515; also see Goldtooth's chapter in this book). Although the issue of sovereignty is a complex one that extends well beyond the boundaries of this book, we need to define it within its present context. What would the sovereignty of Indigenous people mean today for Indigenous people and for the U.S. government? The issue of the sovereignty of Indigenous people should be dealt with. Because many of them over the millennia have provided good stewardship of the land, we can learn from them; they can help us reconnect to the land and teach us how to have more reverence for nature.

A National Industrial Development Policy

Critical to an environmental justice policy is an effective industrial policy. We need to take a holistic problem-solving approach to environmental justice. Environmental justice has to go beyond ameliorating disproportionate environmental

impacts upon people of color and low-income groups; people need decent paying jobs as well. We cannot speak of environmental justice unless we address the need for an industrial policy—an industrial policy to get America working again. To date, the United States is probably the only industrialized country in the world without such a policy. The effects have been devastating for millions of people who have lost their jobs due to plant closings and layoffs. Automotive workers in Ypsilanti, Michigan, lost out to workers in Arlington, Texas, because Arlington workers were willing to make more concessions. Powerful industries are forcing states to compete with one another by marketing anti-labor or anti-environmental packages in order to attract them. Unemployment brings with it an array of social problems such as lowered self-esteem, drug and alcohol dependency, and child abuse and family violence. Since people of color are often the "last hired and first fired," we are deeply concerned about the disproportionate number of African- and Hispanic-American workers who have joined the ranks of the unemployed, and we are deeply concerned that the General Agreement on Tariffs and Trade (GATT) and the North American Free Trade Agreement (NAFTA) may have a harmful impact upon American workers—at least in the short run. Not only does the United States need an industrial policy, the whole world does as well, particularly as the European Economic Community, Japan, and the United States continue to compete for world hegemony and economic dominance. We need policies that lay out rules of both international fairness, environmental protection, and just policies for workers.

A Housing Development Policy: The Core of an Urban Policy

Much of the urban infrastructure of roads, bridges, housing stock, schools, job centers, public buildings, parks and recreation, and public transit is eroding and underfunded. Because a viable urban infrastructure directly relates to the quality of life of inner-city residents, it is important to rebuild, revitalize, and recivilize our inner cities. Segregated urban housing patterns supported by government policies, lending patterns of private banks, and decisions of industry to move to other parts of the country or the world and leave cities with eroding tax bases all help undermine urban infrastructures. Poverty, crime, and health problems abound in the nation's decaying cities. Thousands of inner-city youngsters are hooked on drugs, babies are having babies, black homicide is the number one cause of death among young black males, and more black males on a per capita basis are incarcerated in our prisons than in South Africa's, even though South Africa has fewer constitutional freedoms. Forty-four percent of inner-city youngsters are exposed to lead poisoning from lead-based paint chips or dust, or from drinking from leaded water pipes—lead poisoning that causes irreversible mental retardation and impaired muscular control. Housing discrimination has shackled people of color to the inner cities, where they experience first hand decaying infrastruc-

tures, chronic unemployment, abject poverty, polluting industries, landfills, incinerators, an overloaded and demeaning health and welfare system, and shoddy police and fire protection. Housing development policy should include not only new, improved, or refurbished housing stock, it should also be the focal point for building the decaying infrastructure. Improving the nation's housing stock without improving its decaying infrastructure would only spell failure in the long run.

Toxic Fish Consumption Policy

People use rivers of inner cities and rivers and lakes of wilderness areas and reservations for their livelihood and recreation. Many waterways are polluted by industrial discharges; nevertheless people of color use them for subsistence fishing. Native people in particular fish both to eke out a living and for certain cultural traditions. The increasing contamination of fish has alarmed all who use these waterways, but especially people of color, because they consume a lot more fish than the average citizen. While whites often use catch-and-release methods, people of color are apt to catch and eat. Heavy reliance upon fish consumption advisories to protect consumers of fish should be viewed only as a stopgap measure until toxic fish consumption standards are tightened, our rivers and lakes cleaned up, and industry and government barred from poisoning our waterways. Fish consumption advisories also place a hardship upon people of color because fish are a main source of their protein. What is needed is a policy that is fair and just, one that will keep, improve, and maintain high standards of cleanliness for our waterways.

A Sustainable Development Policy

Environmental justice cannot exist without a sustainable development policy—one that requires business, industry, and individuals to embrace a new environmental ethic to ensure our survival here on the planet earth. Such a policy cannot depend upon the short-sighted use of nature, but such a policy must depend upon achieving a harmonious working relationship with nature. A sustainable development policy would require us to conserve energy, to produce and grow our food in safe ways, to use nontoxic materials in our production cycle, and to give up the chemical war on pests—a war that has poisoned and killed migrant farm workers, destroyed organic materials in soils, created hundreds of resistant strains of agricultural pests, and contaminated our underground water supplies. Sustainable development would require us to change from a consumer-oriented society of conspicuous consumption to one of environmental ethics. We need to work hard not only to address the issues of global warming, destruction of the ozone layer, extinction of plant and animal species, the depletion of our soils of vital nutrients, and the systematic destruction of our rainforests, but also to sustain and improve upon race and class relations. We need to bring both rampant consumerism and population growth under control because *both* of them contribute to the destruction of the biophysical environment and threaten life here on earth. We need a sustainable development policy to deal with problems of inner cities, a policy to guide policymakers and community groups interested in improving the quality of their lives.

A National Farm Development Policy

The farm crisis of the 1980s, fueled by government economic policies, uprooted thousands of people from their land. It has left once-viable rural communities destitute. As the 1990s began, it become clear that the farm crisis was taking on different dimensions as evidenced by the increased concentration of corporate economic control of the land, food production, and distribution systems. The new dimension of the farm crisis manifests itself in the concentration of power that comes from an increased reliance on biotechnology. Agribusiness has been purchasing seed companies, while agrichemical and animal health businesses have been merging, adding a distinctly new dimension of corporate control of our food production. Through genetic engineering and cloning we can produce animals and plants with uniform characteristics. It appears genetic engineering will increasingly be used to circumvent natural processes that affect land, labor, and weather. If we can cultivate orange juice from orange cells, then why bother tending to trees? New farm policies are needed to curtail the power and influence of agribusiness and to protect family farms; we need reform of land tenure laws to make it easier for people to return to the land; and we need policies to protect people and jobs. We need policies to protect migrant workers and people working in the meat-packing and other farm industries from brutal exploitation. We need policies to help revitalize rural America so that it can again be the backbone of community values.

Land Trusts Policies

Land trusts or land banks[3] are strategies to be applied in any country, developed or undeveloped, and in urban or rural areas. Land use in cities or in the countryside is determined by who controls the land. The land trust is not a new idea; it was first applied to wilderness areas over 100 years ago. By restricting land use, these trusts protect land against unwanted development. Millions of dollars have been spent by the Nature Conservancy to buy land to place in trust in order to save wilderness areas from commercial development.

Land trusts are planning tools to help control both the rate and the direction of development. By using these tools, communities can ensure that land is leased—not sold—to small business enterprises, or they can set land aside for greenbelts, urban parks, or urban gardening; or land can be leased to farmers or to citizens for private housing sites. The houses or buildings would belong to private owners—

with the stipulation that the trust has the right of first refusal and that owners would be allowed to recoup money from improvements on homes and buildings, plus a modest profit—but the land would remain in control of the trust. Thus, housing would always be affordable because the land would be freed from speculation. By curtailing speculation, we could prevent urban sprawl and all its negative effects. While eighty percent of the land would remain in private hands, the trust or bank could trade or purchase land to position itself for more control over long-term development. Land trusts are nonprofit corporations that are democratically controlled. In this case the by-laws of the trust should clearly require support of environmental justice.

Banking Policies

Depressed municipal areas should be able to create banks and use profits from investment to rebuild local infrastructures in order to provide much needed services, such as mass transportation, recycling stations, city composting programs, and city parks and recreation facilities.

While this idea may not be suited for every community, we feel it does have promise for large bankrupted urban and rural areas; city- and rural-owned banks may be viewed as temporary systems to be in operation for twenty years or so until cities and rural areas can regain enough financial resources to meet the needs of their citizens. City and rural banks could use profits from investments to retrofit local government buildings for increased energy efficiency, to build small hydroelectric dams, to cleanup rivers for subsistence fishing and other recreational activities, to invest in eco-community development corporations, and to build cogeneration facilities to increase energy efficiency. Profits could be used to purchase solar technology (such as photovoltaic cells and/or active and passive solar systems) for government buildings, to build recycling stations, to weatherize government buildings, to support business incubators as an aid to small businesses, and to improve fire and police protection. Capital to operate these banks would come from city taxes, municipal bonds, various funded government programs, and tax abatements (tax abatements to businesses would be considered as a direct investment in local businesses). To capitalize the banks for such activities, citizens could be attracted to make socially responsible investments. The banking investments would create jobs for carpenters, plumbers, electricians, and unskilled laborers. Private banks would also be encouraged to make loans to enhance environmental justice projects in local communities.

An International Development Policy

To support an international environmental justice policy requires commitment to a new vision of society. Certain toxic chemicals are banned from disposal in the United States. Nevertheless, industry is shipping them to developing countries. In Africa, which is in dire need of foreign exchange, over fifty percent of countries have been contacted by various companies seeking hazardous waste disposal sites. It is interesting to note that while local and county officials of predominantly Third World communities in the United States have been attempting to attract hazardous waste in exchange for jobs, heads of state in Third World countries have been been attempting to attract hazardous waste in exchange for dollars. In fact, dollars earned from hazardous waste disposal exceed the GNP of most Third World countries. The question is whether government officials or heads of state should sacrifice long-term health for short-term economic gain. However, resistance is growing to the siting of hazardous waste facilities in people of color communities in the United States and in countries abroad.

Another area of grave concern is the destruction of the rainforest. We cannot continue to place a disproportionate amount of the blame on Third World countries for rainforest destruction as a tactic to force them to heed international agreements unless we in industrialized countries first establish our own effective energy conservation program. An effective energy conservation program could reduce greenhouse gases significantly. Yet we blame Third World countries for the production of such gases through burning of their rainforests to clear land for local and international interests. And, at the same time, gases derived from combustion of industrial fossil fuels in industrialized countries have been understated. The hypocrisy here is obvious: the developed world attempts to get Third World countries to surrender their sovereignty over natural resource policies by giving them in turn insignificant amounts of foreign aid, technical assistance, and debt-for-nature swaps in which debt is reduced in exchange for unspoiled land. In chapter 14, Buttel states that a substantial amount of money to alleviate poverty or for debt forgiveness might do more good for environmental protection than would biodiversity or the forest-conservation documents prepared for ratification at UNCED.

A Policy for Pollution Abatement and Control: Jobs and the Environment

When the emphasis is upon pollution prevention, what value does pollution control technology have? The emphasis on pollution abatement control should not be on the control of fugitive emissions that result from immediate production processes, but on the cleanup of pollutants already persistent in the environment. These would include slowly biodegradable pollutants such as DDT and other chemical pesticides, and nonbiodegradable pollutants such as toxic mercury, lead compounds, and some radioactive substances. Pollution abatement control can be developed to cleanup our underground water supplies, landfills, superfund sites, oil and radioactive waste in the oceans, wasteheat in bodies of water, sewage disposal sites (animal and plant waste), photochemical smog, and other hazardous

waste. If, however, pollution abatement control is used to control the amount of fugitive emissions into the atmosphere, it should be viewed only as a short-term intervention for controlling toxic chemicals until nontoxic substitutes can be found.

In chapter 7, Bezdek states that:

> Since the late 1970s, protection of the environment and abatement control of pollution have grown rapidly to become a major sales-generating, profit-making, job-creating industry. Expenditures in the U.S. for PABCO and related environmental protection programs have grown (in constant 1992 dollars) from $27.7 billion per year in 1970 to $169.8 billion per year by 1992—increasing much faster than GDP over the same period.

Pollution abatement control industries will undoubtedly make a significant contribution to job creation and environmental protection. Because such technology is needed here and abroad, thousands of jobs could be created, stimulating the economy and helping to lessen our budgetary deficits. Although pollution abatement control is a growth industry that will surpass the defense budget by the year 2000, such jobs need to be decent-paying ones; we should not expect people to work for poverty wages while others live in affluence. While the policies mentioned above would mark some progress, they would still fail to achieve environmental justice. One can live in a clean and pristine environment while still being locked in poverty or being subjected to multiple forms of racism, or both. Therefore we have to go beyond saving the environment. We have to save ourselves from one another.

Regional Environmental Justice Centers

University environmental justice centers could be used to help various levels of government work out general cleanup and pollution prevention policies and strategies. University regional centers could be established to deal with problems of environmental justice. It will require the expertise of many disciplines to solve current environmental problems. It will require unequivocal support from universities, governmental funding agencies, and community groups. It will require the support of faculty and students from different professional backgrounds working in participatory research projects with local citizens. We need these justice centers not only to work on prevention and control, but also to help make the necessary peacetime economic transition. We must make the production cycle more compatible with the environment and at the same time render decent paying jobs for people who need or want them. Billions of dollars will be involved as we reshape industries to change their production patterns to be compatible with the biophysical environment. The concept of an environmental justice institute originated at the University of Michigan must take hold in other universities. Further, we hope universities throughout the country will find creative ways to organize multiracial centers to work with affected communities.

To solve problems of toxic exposures and disease, we must also focus on the cleanup of neighborhoods, particularly since our neighborhoods need cleaning up anyway. To do otherwise will engulf us in years of debate while people continue to suffer from toxic-induced and -aggravated disease. More immediate policies need to involve community groups in the decision-making or participatory research projects related to their well-being. Such projects should be supported by the 3Rs and pollution prevention strategies, with the latter being by far the most effective. These policies or solutions, however, are only temporary. To effectively deal with issues of disease and exposures, we must change political and economic determinants; the issues of hunger, unemployment, poverty, and distributive justice will have to be dealt with. Environmental justice attempts to deal with such determinants by designing and implementing policies to focus on health care, energy, education, sovereignty for Indigenous people, industrial development, sustainable development, housing development, farm development, and international development. These policies, although not conclusive, may overlap. We cannot expect to solve the world's environmental and social problems by just dividing the world into little specialized segments for understanding and solution. We need to take a holistic approach if we expect to solve the most pressing social and environmental problems confronting us today. Both universities and professionals need to make a paradigm shift in order to view exposures and disease from a different framework. This is not to underplay the important role of traditional research; it is important, but so are people's lives.

Responding to these social and environmental problems gives us a chance for a new identity—one that is grounded in respect for nature and for one another. This new identity is not based upon war or environmental destructiveness, but upon a society where everyone is environmentally literate, where schools are exciting places to learn, where our cities are safe, livable, friendly places to be, and where diversity is celebrated; where no one is in poverty, and where everyone is protected against hunger and has a decent place to live. Our new identity comes from building new and sustainable communities where participatory research, democratic decision-making, and other ways of knowing are just as important as conventional research. Isn't this a risky thing to attempt? You bet it's risky! But life will be far riskier if we fail to create our new identity of caring, of being certain about the safety of our environment, and of hope.

In order for policy decisions to make fundamental change, we must change the role of the professional, science, and universities. Additional discussion that addresses these roles and their limitations can be found in the following three chapters. However, we must be prepared to make other structural and political changes in which scientific communities are embedded.

Notes

1. Certainty seldom exists because of too many indeterminacies in life. But surely one of many jobs of society is to encourage or promote certainty—yet it is a struggle that is never won. People want to live with a sense of certainty that they live in toxic free or safe communities. People demand certainty. The demand for certainty comes from their fear of the unknown and of the potential impact of multimedia exposure on their health.

2. A good share of the information related to the political economy of inquiry came from *Hidden Arguments*, by Sylvia Noble Tesh, a faculty member at the University of Michigan School of Public Health.

3. Land banks operate from the same principles as land trusts; however, the former are governmentally controlled.

2

Environmental Justice and the Professional

Conner Bailey, Kelly Alley, Charles E. Faupel, and Cathy Solheim

Professionals often have a trained incapacity to look beyond their areas of expertise. Engineers and scientists (including social scientists) tend to develop expertise in relatively narrow subfields within their disciplines. The process of specialization contributes to the power of the scientific enterprise and the ability of engineers to solve increasingly complex problems. Greater specialization, however, increases problems of communicating across disciplinary or even subdisciplinary lines.

Introduction

There is no doubt that risks associated with environmental hazards disproportionately affect minority populations that are least able to defend themselves due to poverty and political powerlessness (Bryant and Mohai, 1992; Bullard, 1990). Hazardous and solid waste disposal sites, as well as petrochemical and other sources of environmental pollution, typically are located in poor neighborhoods, far from the comfortable suburbs where the captains of industry live. Risks associated with these sources of pollution include the intensely personal danger of cancer or respiratory ailments from exposure to industrial pollution, as well as the psychological and social disruption caused by fear of an industrial accident or the chronic threat of pollution from a landfill or incinerator.

Conner Bailey is an associate professor of rural sociology at Auburn University. Since joining the Auburn faculty in 1985, Dr. Bailey has focused his attention on public participation in environmental decision-making. Together with Charles E. Faupel, he has been studying the social and political impact of the nation's largest hazardous waste landfill, located in Sumter County, Alabama, the population of which is seventy percent African-American.

Kelly Alley is an assistant professor of anthropology at Auburn University. Since joining the Auburn faculty in 1990, she has been involved in the study of grassroots responses to problems of solid waste landfills and other environmental controversies in Alabama.

Charles E. Faupel is an associate professor of sociology at Auburn University. Dr. Faupel has been working with a team of researchers at Auburn on a study of grassroots environmental organizations in Alabama.

Cathy Solheim is an assistant professor of family and child development at Auburn University. Recently, she has been focusing her research on how involvement in grassroots environmental organizations affects family life.