Strengthening Community Capacity to Participate in Making Decisions to Reduce Disproportionate Environmental Exposures

Environmental exposures impose a disproportionate health burden on low-income populations and communities of color. One contributing factor may be the obstacles such communities face to full participation in making policy decisions about environmental health.

This study described and analyzed the characteristics that contributed to communities' capacity to participate in making environmental decisions and suggested steps public agencies could take to achieve more meaningful participation. By strengthening community capacity, advancing authentic participation, and building democratic power, it might be possible to alter current patterns of health inequities.

Strengthening participation by working with communities to develop the capacities needed to be effective in such processes is a key role for local, state, and national environmental agencies. (*Am J Public Health.* 2011;101:S123–S130. doi:10.2105/AJPH.2011.300265)

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ALTHOUGH ENVIRONMENTAL exposures impose a disproportionate burden on the health of low-income populations and communities of color, these groups are often excluded from the policy decisions that shape the distribution of risk. In this study, we considered the determinants of participation in public policy decisions about environmental health and proposed strategies for strengthening what has been called "community capacity," defined as characteristics that enable communities to protect and improve their well-being. Our focus described and analyzed pathways for strengthening community capacity.

To frame this discussion, we proposed a conceptual model of participation and its impact on policy processes. In this model, shown in Figure 1, the health impact of environmental exposures (Box G) was determined by the presence of a particular mix of environmental stressors (Box A): the presence (or absence) of varying levels of determinants, such as previous levels of social capital that affected the ability of communities to participate effectively in decision-making about those stressors and thus mediate their effects (Box B); the current state of the community's capacity, as indicated by various dimensions of capacity (Box C); and the quality of the participatory processes themselves (Box D). These processes, shown by the 2 way arrows that illustrate the reciprocal relationships among variables of interest, mediate how communities respond to environmental exposures. As a result of these processes, changes occur in exposures to environmental stressors (Box E) and in community power, capacity, and collective efficacy (Box F). The focus of this article explored how to strengthen community capacity (Box C), given its critical role in influencing the outcomes of interest (Boxes E, F, and G).

Figure 1 also identifies 3 distinct intervention opportunities to reduce environmentally induced diseases and inequities: first, by preventing exposure to stressors through regulation, product substitution, or engineering changes (Box A); second, by strengthening community capacity through, for example, training, technical assistance (TA), empowerment, and community organization, the topic of this essay (Box C); and third, by redesigning participation processes to foster more authentic and meaningful participation in environmental decision-making (Box D).

This study incorporated 3 sources of knowledge. First, we used the ample literature on community capacity, public health, and environmental justice (EJ). Second, we drew on our own decades of experience as engaged scholars in the areas of public health and environmental justice. Third, we used feedback from researchers, policymakers, community advocates, government officials, and others to an earlier version of this article.[1] This conference emerged in part from the Environmental Protection Agency's (EPA) recent efforts to incorporate environmental justice concerns into rule-making, providing additional opportunities for participation.[2–4]

DISPROPORTIONATE EXPOSURES AND POWER, AND ENVIRONMENTAL JUSTICE

Although all communities can be at risk from environmental stressors, communities of color, often located in areas with concentrated poverty and cumulated socioeconomic disadvantage, are typically at highest risk. Although a long-standing concern, disproportionate environmental exposures attracted new national attention by researchers and policymakers in the 1980s when protests in Warren County, North Carolina led to a series of reports that found African American and other communities of color were more affected by environmental burdens than White communities.[5–7]

This gave rise to literature that asked whether such patterns of disproportionate exposure could be confirmed by multivariate and other sophisticated statistical techniques, recognizing, for example, that patterns of racial disparity in the environmental burden could be driven by other correlational factors, such as land use or land value. A recent meta-survey of the existing research, however, suggested that race was actually the variable most consistently associated with higher risk or proximity to hazards.[8] Although there are legitimate

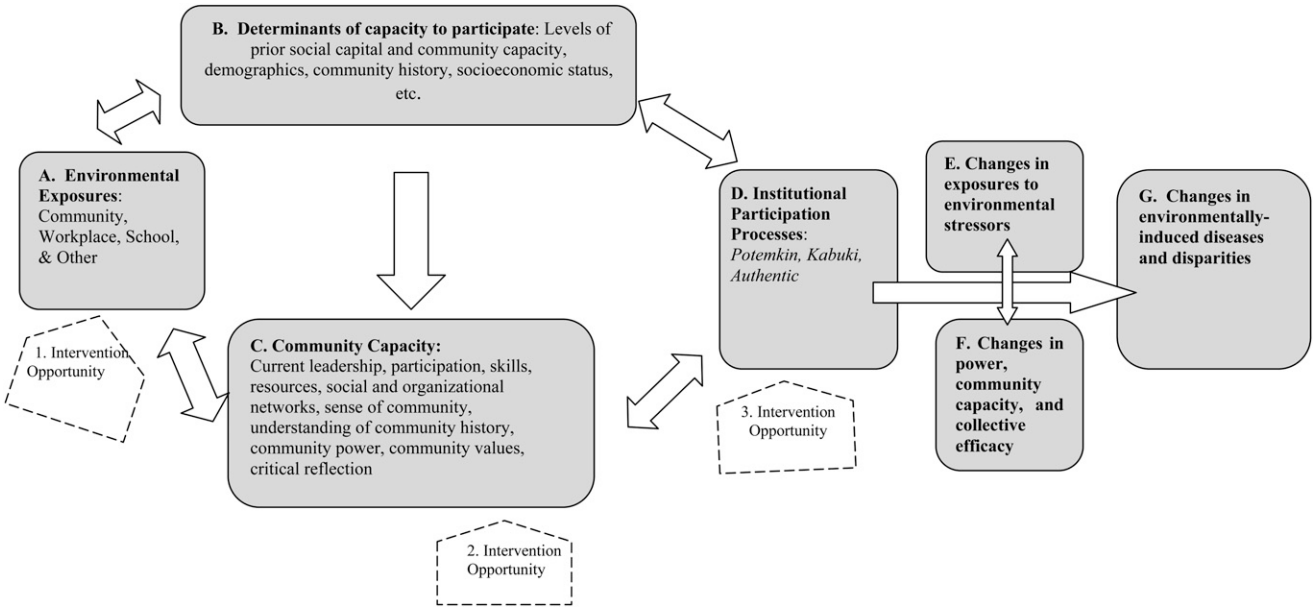

FIGURE 1—Conceptual model for community participation's impact on environmental exposures.

concerns about the state of the research, including the need to better account for spatial autocorrelation and control for metropolitan variations in industrial structures, the weight of the evidence suggested that both income and race contributed to disproportionate environmental exposures.[9–11]

The consistent finding on race was important because in the United States today, African American, Latino, Native American, or Asian race/ethnicity is often a marker for having less power. It is this disproportionate power, activists suggest, that produces disproportionate exposure, that is, the urban and rural "riskscapes" that place freeways, hog farms, and other hazards near low-income communities of color while locating amenities, such as parks and markets, far away in more affluent, White communities.[12] These disproportionate exposures are not accidents of history but rather part of a broad pattern of the uneven distribution of environmental amenities and hazards.[12] In this sense, EJ advocates are concerned not with race but racism, not just with policy decisions and outcomes, but more fundamentally with the underlying power differentials that drives these decisions.[13]

To improve the potential that the voices of low-income residents and communities of color are heard and their interests represented, advocates sought to mobilize communities to get to the policy table.[14,15] As depicted in Figure 1, the opportunities for mobilization—and for affecting decision-making—depend on community capacity as well as receptivity of government agencies and other organizations. We discuss later how to improve receptivity, after first specifying the dimensions of community capacity that contribute to bringing the voices of less advantaged communities into the decision-making process.

UNDERSTANDING COMMUNITY CAPACITY

Community capacity was defined as "a set of dynamic community traits, resources, and associational patterns that can be brought to bear for community building and community health improvement."[16] Because the term was used in several fields, it was not surprising that the literature lacked precision.[17] In this study, the term "community capacity" was used to describe a modifiable characteristic of communities and the term "community capacity building" to describe activities designed to increase community capacity.[18]

Researchers considered community capacity as a modifiable variable that contributed to improved outcomes at various levels (e.g., individual, organizational, community, and jurisdictional) and in various domains (e.g., health, program implementation, civic participation). These broad and sometimes divergent conceptualizations of community capacity made it important for researchers to specify which dimensions of community capacity they were studying and for interventionists to identify which elements of capacity they sought to modify to achieve desired outcomes.

Raeburn et al.[19] identified 3 key dimensions of community capacity building, emphasizing: (1) the role of assets and empowerment (vs disease and deficiency); (2) the role of bottom–up, community-determined processes and agendas (vs top–down/externally determined ones); (3) and the processes for developing community competence to protect community well being. Although all of these dimensions could also apply to changes in individual and organizational capacity, this study focused on the community as whole (i.e., the summary and interactive effects of individual and community skills).

This study conceptualized community capacity differently

TABLE 1—Measurement Instruments and Metrics to Assess Selected Dimensions of Community Capacity

Dimension	Metrics to Assess	References on Measurement
1. Leadership	No. of individuals playing various leadership roles	37–40
2. Participation	Counts of individuals participating at various levels	37–41
3. Skills	Self or external rating of relevant skills, including both technical/scientific and organizing	37,38,41
4. Resources	Inventory of human, social, and financial resources	37,38
5. Social and organizational networks (community linkages)	Mapping organizational networks	37
6. Sense of community	Feelings of connection, support, and collective problem solving	37,42
7. Community power (empowerment, perceived control)	Ability to influence decisions, partnerships with institutions, perceived impact on policies, perceived control at multiple levels	37,40,42
8. Communication	Content, frames, and scope of written and verbal communication within community initiative	38,43
9. Group cohesion	Sense of belonging to group, ownership over what group does	40
10. Community capacity	Historical narrative or cumulative scale of previous dimensions	42

than social capital. Community capacity was a characteristic specifically of communities, the chosen focus of inquiry, whereas social capital was regarded as an attribute of social networks, neighborhoods, communities, cities, states, and nations. As a concept, social capital lacked precision.[20–23] The study also defined "collective efficacy" (a variable in Boxes B and C in Figure 1) as a community's willingness and ability to act for one another's benefit,[24] noting that this was both an influence on and an outcome of community capacity.

Disparity and Capacity

Communities that underwent rapid demographic change seemed to have lower community capacities and, thus higher vulnerability to environmental burden. Several studies examined the "chicken or egg" question of whether toxic industries moved into poor, fragmented communities or whether these communities became poorer and more fragmented as low-income families moved in for cheap rent.[25–28] In examining this question, Pastor et al.[29] found that communities that experienced "ethnic churning"—defined as the absolute sum of shifts in demographic composition over time to capture changes between minority groups as well as between White and non-Whites—were more likely to wind up with new hazardous facilities. With the results holding in multivariate and simultaneous models, the authors concluded that these shifting neighborhood patterns decreased community cohesion, a component of community capacity, possibly making the areas politically weaker and more vulnerable to the siting of new hazardous facilities.[29(p.19)]

Pastor et al.[30,31] also found that linguistic isolation was significantly associated with enhanced cancer risk from air hazards and suggested that this might be the result of inadequate outreach and a lack of community capacity to interact with official decision-making systems. In their work, the results were maintained in multivariate regressions that included race, income, and other variables, and the inclusion of linguistic isolation tended to diminish the impact of measures like percentages of Latinos and percentages of Asians, suggesting that some of what was seen as racial was, once again, better seen through the lens of power and capacity.[30,31]

Simple provision of information matters as well for understanding disparity and capacity. Because many businesses do not wish to be exposed as toxic "bad neighbors," providing accessible information may be an effective regulatory strategy that encourages firms to reduce emissions or to at least report reduced emissions.[32] However, it is not just information: communities must be able to process and use new data. For example, in California, after an environmental justice law was passed in 1999, largely at the behest of Latino legislators, there were subsequent reductions in firm-based toxics in the Latino community.[33] Information is a necessary but not sufficient ingredient for community capacity.

Other studies focused explicitly on how particular community capacities, or lack thereof, influenced overall community health. Kawachi et al.[34] and Sampson et al.[24,35] found relationships between community capacity, community efficacy, and community health (including violence), whereas other studies found no such associations.[36] However, the evidence suggested that some specific dimensions of power and capacity mattered, setting the stage for a fuller discussion of community capacity and measures and strategies for strengthening it.

Measuring Community Capacity

To assess the determinants and consequences of community capacity, researchers must be able to define and measure the concept. Table 1 shows a list of 10 selected dimensions of community capacity, with references to research that attempted to provide measurement metrics. For example, Maclellan-Wright et al.,[44] Trojan and Nickel,[45] and Goodman et al.[46] developed and tested measures of community capacity that Freudenberg,[18] Minkler et al.,[47] and Parker et al.[43] applied to the field of environmental health promotion. The dimensions listed in Table 1 are defined elsewhere.[18]

TABLE 2—Intervention Strategies to Increase Community Capacity

Strategy	Definition
Training and technology transfer	Process by which community participants gain knowledge, skills, competencies, or technologies that enable them to participate in assessing and remediating environmental hazards and participating in relevant policy deliberations.
Technical assistance	Tailored support that enables community participants to gain information or skills to solve problems or to participate more effectively in decision-making processes.
Community-based participatory research	A research process in which community residents participate in selecting issues, designing studies, interpreting findings, and presenting results to policymakers for the purpose of reducing environmental health inequities and promoting healthier public policies.
Empowerment approaches	Process by which individuals, communities, and organizations gain power and mastery over their lives in the context of changing their social and political environment to improve equity and quality of life.
Community organizing/social action	Community mobilization and organization to enable a disadvantaged segment of the population to make demands on the larger community for increased resources and more equitable policies.
Authentic participation processes	Agency designed participation processes that improve community capacity by getting people involved early, providing them with information and resources for full participation, and ensuring that outcomes reflect their participation.

Table 1 demonstrates that investigators have proposed methods for assessing and measuring community capacity, although this work is still at an early stage. The development of such instruments is a priority for advancing research on community capacity, recognizing that it may also be necessary to develop quantitative and qualitative measures that are tailored for the specific use in a particular setting. The literature of Pastor et al.,[29–31] Sadd et al.,[48] and Morello-Frosh et al.[49] on ethnic change and community cohesion, linguistic isolation, and the interaction of information and politics in the arena of environmental inequities exemplified such grounded studies. Empirically identifying which capacities are most important for which issues and policy choices will help with advancing research and informing the goal of improving community capacity.

Intervention Strategies to Build Community Capacity

Table 2 presents intervention strategies to increase community and organizational capacity to protect against environmental stressors. Although these intervention strategies are not fully distinct from each other (e.g., a community-based participatory research [CBPR] approach could include TA), they are conceptually different. For example, empowerment strategies seek to build community power, whereas community organizing emphasizes mobilizing the population, 2 different approaches that may be combined. Deciding which strategy is most appropriate should stem from a specific assessment of the causes of lack of capacity. The strategies also differ in who acts as agent for change, with training and TA putting more power in the hands of formal institutions and CBPR, empowerment approaches, and community organizing regarding the community itself as change agent.

Training and technology transfer. In this approach, lack of capacity is seen as a lack of information and interveners seek to supply that information and the technology to acquire and process the information.[50] Examples of this approach include disseminating information about best practices, training programs for community leaders, and the development of practice guides. Some of the problems identified with this approach are reaching agreement on the skills and information needed; assuring that trainees can use the new skills in practice settings, and the difficulty in including bottom–up perspectives in nationally driven training programs.[50]

Technical assistance. In this approach, communities and their organizations receive hands-on assistance from technical experts or more experienced peers to complete various tasks. TA can be tailored to meet the unique needs of a specific community and can address a wide range of needs, from help in designing a survey to monitoring environmental pollutants to designing a media advocacy strategy.[51] Some evidence suggested that not all organizations or communities were willing or ready to receive TA, perhaps requiring other kinds of support first,[21] and that some forms of TA might be more likely to succeed than others.

Community-based participatory research. CBPR is a collaborative approach to research that engages academic and community partners in both knowledge generation and intervention strategies that benefit the communities involved.[52] By incorporating the experiences of community residents, CPBR improves the validity and interpretation of research findings and, further, prepares a cadre of residents who "own" and can advocate for the implementation or application of their findings.[52,53] The challenges of CBPR include the time and resources it requires for effective implementation, the conflicts it can generate among participants, and some policymakers' resistance to accepting its findings.[52–57] In addition, some researchers may employ the rhetoric of CBPR without its authentic practice, something that can create challenges for future collaborations by other researchers in the locations where this takes place.

Empowerment approaches. Advocates for empowerment approaches to enhancing community capacity identify the primary problem as community residents' lack of power. Thus, increasing the power of community participants gives them a more equitable voice in defining the problem and devising and implementing solutions.[58] This new power can be used to gain needed resources, challenge vested interests, and improve community environments. The overtly political dimensions of this approach make

TABLE 3—Activities to Enhance Dimensions of Community Capacity

Dimension	Activities
Leadership	Prepare environmental activists to be leaders; educate community leaders about environmental issues; create forums to bring formal and informal community leaders together to consider environmental health issues; assist with strategic planning and policy development
Participation	Offer incentives for participation; conduct outreach to uninvolved sectors of population; provide residents with voice in making key decisions
Skills	Offer skills workshops and technical assistance on environmental health issues; create opportunities for participants to exchange skills; assist efforts to link those with skills inside and outside community to those with needs
Resources	Serve as bridge between community and external resources (e.g., state health dept, foundations); assist participants to identify and develop local assets; contribute staff time to community investigations; build capacity for advocacy; assist in writing grants and working with funders to support community groups.
Social and organizational networks	Support and nurture local, regional, and national coalitions that bring together concerned citizens, environmental activists, scientists, health professionals, and others for environmental health promotion activities
Sense of community	Support community events that build sense of identity; create safe spaces for community residents to discuss, analyze, and study environmental health issues
Understanding of community history	Assist residents to study and analyze previous health and environmental issues facing community; prepare reports aimed at community residents that develop such understanding
Community power	Join coalitions for environmental health to enhance community strength; provide community with information so they can confront special interests effectively; support political reforms that level the playing field for those with less influence; provide scientific information that can be used in political arena
Community values	Articulate values that underlie public health efforts; defend community values on health against disease promoting organizations
Critical reflection	Assist community residents to analyze and reflect on successes and limitations of their actions to promote environmental health

Source: Modified from Freudenberg[18] and Goodman et al.[46]

some researchers and policymakers uncomfortable and its frank acknowledgment of power differentials may elicit the opposition of more powerful constituencies, who might lose power if empowerment approaches succeed.

Community organizing/social action. Community organizing is a highly related effort to overcome political imbalances by enabling disenfranchised groups to participate more effectively in the political system as well as to transform power relationships. Community organizing has been used to improve health in a variety of settings and includes coalition building, development of organizational and community capacity, leadership development, and community mobilization.[59] Like CBPR and empowerment strategies, community organizing requires time and human resources and may elicit opposition from more powerful constituencies.

Authentic participation processes. Authentic participation processes seek to improve community capacity through conscious and meaningful government-designed participation processes (Figure 1, Box D). Identifying communities with potentially low capacity in the early stages of planning and providing them with the resources and information (as with CPBR) to meaningfully contribute to the decision-making process can strengthen community capacity. To avoid paternalism, communities need to play a role in assessing their needs for capacity building.[1] Because some communities may understandably have trouble trusting government agencies, given that some agencies have a history of not recognizing the expertise that communities bring to the table, outside facilitation may help with building trust. In addition, training agency officials in the modalities of authentic community participation can help them to overcome technocratic and bureaucratic approaches. Finally, there is a need to insure that, at least in part, the policy decisions made reflect the input the community has provided.

Activities to Enhance Community Capacity

Table 3 describes the actions that interveners can take to enhance community capacity using these strategies. Although some dimensions of capacity may lend themselves to particular strategies (e.g., training and TA to the development of skills), decisions about which activities to use to enhance the capacity of a specific community to achieve its defined objectives will require an empirical analysis in a particular time and place. Moreover, interventions to increase capacity can occur at various levels, including individual, community, organization, and jurisdiction.

The question is if these activities and actions work. Wallerstein concluded that empowerment was a "viable public health strategy" and that empowerment strategies, participation, and other bottom–up approaches became prominent paradigms and effective strategies within public health.[60] In their cross-site case study of 4 CBPR partnerships, Minkler et al.[47] identified several of the dimensions of community capacity listed in Table 1 as having improved over the life of the projects.

In another example, Corburn[61] reviewed the Eastern Neighborhoods Community Health Impact Assessment (ENCHIA), a San Francisco-based effort that brought together local agencies with residents in a successful planning process. Among the features was a health impact assessment model that went beyond a formal environmental impact review and considered all the

elements that helped to produce neighborhood health—in short, a cumulative and holistic approach that fit well with community concerns. Corburn noted how community capacity improved and how lessons learned from the ENCHIA process migrated to the city of Richmond as well to the evolution of region-scale efforts such as the Bay Area Regional Inequities Health Initiative and the Great Communities Collaborative.[61]

A final example comes from the work of 1 of the authors (Pastor) with an environmental justice collaborative in Southern California. Growing out of an earlier project that demonstrated environmental disparities in that region, community-based organizations, together with academic researchers, conducted a series of "ground-truthing" exercises in which local residents in 8 communities created their own maps of hazards and sensitive land uses and compared these with official state data. The maps revealed a significant number of "hidden hazards" and documented that the communities were subject to a pattern of cumulative exposures. Five of these communities then conducted local air monitoring and demonstrated that air quality in their neighborhoods was much worse than state standards. The results were presented to the Los Angeles City Council, written up into a report, and then used by community leaders to press for a "Clean Up, Green Up" campaign to target resources to neighborhoods.[62] Although the actual impact on policy is still to be seen—in early 2011, the City Council agreed to send the recommendations to the relevant committees making policy on land use and economic development. This illustrates how community capacity can be enhanced by CBPR and community organizing for policy change. An important future priority is to expand systematic research on the efficacy of interventions to increase community capacity.

IMPLICATIONS FOR PRACTICE

In summary, the evidence showed that increased community capacity can help a community reduce the level and impact of environmental stressors, such as exposure to toxic chemicals and air pollution, siting of hazardous facilities, or burdensome traffic routes.[7,47,61,63] How can this capacity be enhanced? What are the strategies that could address the concerns of EJ communities? Can we identify places where enhanced capacity is needed?

Each of the previously identified capacity building strategies offered some promise for helping EJ communities to address their concerns. Capacity building strategies that give more control to communities (e.g., CBPR, empowerment, and community organizing) may more fully address the fundamental causes of environmental inequities—which stem from the lack of political power—than more agency-controlled processes (e.g., training and TA, authentic participatory processes). However, these community-driven strategies are more labor and resource intensive and require a higher level of commitment from communities, researchers, and agencies.

We offer a few recommendations for how to improve community capacity with the purpose of improving environmental health. These are based on the discussion of community capacity in the previous section and, in some cases, earlier work.[63]

Start the Involvement Early

Based on previously described determinants of community capacity, such as cohesion/ethnic churning, linguistic isolation, and the availability of useable information, organizers and agencies may consider screening for the presence or absence of these factors to identify EJ and overburdened communities as possible candidates for efforts to build community capacity.[64–66] Existing independent EJ organizations in the region may be the most credible agents for capacity building; if none exist, other trusted local organizations (e.g., civil rights groups) may serve as the starting partner.

We noted that community capacity is contextual and thus interventions should suit the particular circumstances. Key factors that need to be considered include whether the community is losing or gaining power, ethnic or immigrant makeup, and the strength of existing indigenous organizations. Practitioners can use various scales of empowerment to determine where a community is situated[18,67,68]—we particularly suggest Freudenberg's continuum of community power, as it was developed within the context of public health.[18] From there practitioners can choose the strategies (Table 2) and activities/actions (Table 3) that best fit the relative capacity and goals of their community.

Define and Develop the Community–Agency Relationship

In some cases, community capacity can be built in coordination with government agencies that are willing to engage in authentic participation processes (Table 2). Agencies need to consider a variety of issues to be equal and receptive partners in the process, many discussed in the National Research Council's book, *Public Participation in Environmental Decision-Making*.[69] Both the EPA and other agencies have some model programs that make resources available and include assistance in building capacity for communities. Although public agencies have the main responsibility for engendering trust, EJ communities also need to work through their historic distrust for effective partnership. This suggests that effective relationships result from proven trustworthiness that forms over the course of repeated engagements and reciprocal sharing—rather than a single outreach process or focus group.

More research is needed to define the connection between building community capacity and improving health outcomes. A clearer understanding of the pathways by which community participation leads to better health will make it easier for communities to justify and policymakers to fund such activities. Along the same lines, more evaluation is needed to understand what strategies and action best strengthen community capacity. We suggest evaluators or researchers need to be hired to do ongoing and interactive evaluation, preferably in partnership with the communities involved, consistent with principles of CBPR.

Take on the Question of Power

To the extent that disproportionate power contributes to disproportionate exposures, strengthening community capacity is about building power.[70] For some practitioners, this means that community organizing and creating a social movement are necessary components of capacity building.[71] For agencies, this

means that relations with EJ advocates may not always be harmonious and that simply hearing the input of the community will not be enough if this input does not influence the outcomes of decision-making processes.

CONCLUSIONS

Although this article focused on capacity building at the community level, it is important to consider the implications at the federal and national level. For example, it would be useful to further revitalize the National Environmental Justice Advisory Committee, a group that includes representatives of community, academia, industry, environmental, indigenous, as well as government and tribal groups, but one whose importance and prestige declined during the previous administration. There are also emerging opportunities to include EJ voices in newly developing issue areas, such as climate change, particularly because some of the proposed mitigation strategies, including cap-and-trade systems, run the risk of potentially creating further inequities.[72] Federal agencies should continue to provide the small grants and other services that help to build local capacity in the areas of environmental health.

Ultimately, by enhancing community capacity, it may be possible to alter the inequities that underlie the environmental riskscape of America. However, the goal, we should stress, is not simply to redistribute risk but rather to minimize it in each of our communities. In this view, community capacity is not a zero-sum game, in which one person's increased capacity comes at the expenses of another's. Rather, by empowering all communities to be heard, we will be able to better protect the earth, air, and water on which our individual, community, and global health depend. ■

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