

Vulnerability Does Not Fall from the Sky: Toward Multiscale, Pro-Poor Climate Policy

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A society is ultimately judged by how it treats its weakest and most vulnerable members.

—Hubert H. Humphrey

If a free society cannot help the many who are poor, it cannot save the few who are rich.

—John F. Kennedy

If some combination of narcissistic morality and raw self-interest does not help reduce vulnerability, then perhaps some good analysis and political engagement may do so.

Analysis of vulnerabilities can help answer where and how society best can invest to reduce vulnerability. Analysis may not motivate all decision makers to make those investments, but it can give development professionals, activists, and affected populations fodder to promote or demand the rights and protections that can make everyone better off. Climate variations and changes present hazards to individuals and to society as a whole. The damages associated with storms, droughts, and slow climate changes are shaped by the social, political, and economic vulnerabilities of people and societies on the ground. Impacts associated with climate

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can be reduced through measures falling anywhere on a spectrum from climate change mitigation to reduction of the vulnerabilities of individuals and groups (McGray et al. 2007). This chapter calls for evaluation of the relatively neglected social and political-economic drivers of vulnerability at one end of this spectrum. The objective is to enable consideration of a full range of vulnerability-reducing policy responses. The chapter is concerned with the reduction of the everyday vulnerabilities of poor and marginal groups exposed to climate trends and events.

The world's poor people are disproportionately vulnerable to loss of livelihood and assets, dislocation, hunger, and famine in the face of climate variability and change (Cannon, Twigg, and Rowell 2003; and chapters 8 and 10 of this volume). Living with multiple risks, poor and marginalized groups must manage the costs and benefits of overlapping natural, social, political, and economic hazards (chapter 9). Their risk-minimizing strategies can diminish their incomes even before shocks arrive; and shocks can reinforce poverty by interrupting education, stunting children's physical development, destroying assets, forcing sale of productive capital, and deepening social differentiation from poor households' slower recovery (chapter 10). The poor also may experience threats and opportunities from development or climate action itself, such as efforts to reduce greenhouse-gas emissions in such sectors as household energy, land, and forest management (ICHRP 2008; O'Brien et al. 2007; Turner et al. 2003; chapter 11 of this volume).¹

The good news is that policy can drastically reduce climate-related vulnerability. Although the best global data indicate human suffering and economic loss are worsening in the face of natural hazards,² the number of people affected compared with the total population is declining (Kasperson et al. 2005). This reduction in vulnerability is most pronounced in high-income countries, where higher levels of well-being, along with better infrastructure, policy, and planning, are successfully mediating the relationship between climate trends or events and outcomes. Effective climate action can further widen this gap between climate stressors and the risk of hardship.

In 1970, when Cyclone Bhola hit Bangladesh with 6-meter tidal surges, some 500,000 people perished (Frank and Husain 1971). In 1991, a similar storm, Cyclone Gorky, struck Bangladesh, causing 140,000 deaths. However, in 2007, when Cyclone Sidr (stronger than either Bhola or Gorky) hit Bangladesh with 10-meter tidal surges, fatalities were 3,406. Although population density increased in this area between the Bhola and Sidr catastrophes, the death toll was reduced dramatically (Government of Bangladesh 2008). Damage was reduced by Bangladesh's shift from a focus on

disaster relief and recovery to hazard identification, community preparedness, and integrated response efforts (CEDMHA 2007). Most important were sophisticated early-warning and evacuation systems (Government of Bangladesh, Ministry of Food and Disaster Management 2008; Batha 2007; Bern et al. 1993), which made Sidr 150 times less fatal than Bhola.³ This is an example of effective climate action.

Although there are notable policy successes, vulnerability of poor, marginalized, and underrepresented people remains widespread. In cases like Bangladesh, women, the poor, and other marginalized groups are disproportionately and unacceptably vulnerable (Chowdhury et al. 1993). When facing droughts in northeast Argentina, industry-dependent tobacco growers are more vulnerable than independent agroecological farmers, whose farms are more biodiverse, more technologically equipped, and less exposed to external markets, and who have greater political negotiating power (Kasperson et al. 2005). In Kenya, privatization of pasturelands has improved security of some landholders, while making poorer and landless people much more vulnerable (Smucker and Wisner 2008). In Northeast Brazil, the poor remain vulnerable because of their dependence on rain-fed agriculture combined with little access to climate-neutral employment (Duarte et al. 2007). Poorer people excluded from access to services, social networks, and land experience intensified climate-related vulnerabilities and losses caused by unequal social relationships of power and representation. These kinds of problems are also a target for climate action.

The vast differences in damages associated with similar climate stressors in the same place at different times, from place to place, or among different social strata reflect the complex and nonlinear relationship between climate and outcomes. The damages associated with climate events result more from conditions on the ground than from climate variability or change. Climate events or trends are transformed into differentiated outcomes via social structure. The poor and wealthy, women and men, young and old, and people of different social identities or political stripes experience different risks while facing the same climate event (Blaikie et al. 1994; Hart 1992; Agarwal 1990; Swift 1989; Watts 1987; Sen 1981; Wisner 1976; chapters 5 and 9 of this volume). These different outcomes are the result of place-based social and political-economic circumstances. The inability to manage stresses does not fall from the sky. It is produced by on-the-ground social inequality; unequal access to resources; poverty; poor infrastructure; lack of representation; and inadequate systems of social security, early warning, and planning. These factors translate climate vagaries into suffering and loss.

Poverty is the most salient of the conditions that shape climate-related vulnerability (Cannon, Twigg, and Rowell 2003; Prowse 2003; chapters 8 and 10 of this volume). The poor are least able to buffer themselves against and rebound from stress. They often live in unsafe flood- and drought-prone urban or rural environments; lack insurance to help them recover from losses; and have little influence to demand that their governments provide protective infrastructure, temporary relief, or reconstruction support (ICHRP 2008). Indeed, their everyday conditions are unacceptable even in the absence of climate stress. Climate stresses push these populations over an all-too-low threshold into an insecurity and poverty that violate their basic human rights (ICHRP 2008; Moser and Norton 2001).

Because the “adaptation” side of climate action aims to reduce human vulnerability, it cannot be limited to treating incremental effects from climate change so as to maintain or bring people back to their pre-change deprived state (also see chapter 10).⁴ As Blaikie et al. (1994) point out, “despite the lethal reputation of earthquakes, epidemics, and famines, many more of the world’s population have their lives shortened by unnoticed events, illnesses, and hunger that pass for normal existence in many parts of the world...” (p. 3; also see Kasperson et al. 2005 and Bohle 2001). It is this “normal” state that effective climate action must aim to eradicate if climate variation and change are to be downgraded from deadly threats to mere nuisances.

Following a brief review of vulnerability theory, this chapter frames an approach for analyzing the diverse causal structures of vulnerability and identifying policy responses that might reduce the vulnerability of poor and marginal populations. The chapter argues that an understanding of the multiscale causal structure of specific vulnerabilities—such as risk of dislocation or economic loss—and the practices that people use to manage these vulnerabilities can point to solutions and potential policy responses. Analysis of the causes of vulnerability can be used to identify the multiple scales at which solutions must be developed, and can identify the institutions at each scale responsible for producing and capable of reducing climate-related risks.

The chapters of this volume concur that there is insufficient knowledge on the social dimensions of vulnerability reduction intervention policies and programs.⁵ This chapter outlines a policy-research agenda on causal structures of multiple vulnerabilities in different environmental and political-economic contexts so that causal variables can be aggregated to help develop higher-scale vulnerability reduction policies and strategies. The focus on

causality builds on insight from successes of existing project approaches, such as social funds, social safety nets, or community-driven development (chapter 10), and successful adaptation support based on coping and risk-pooling practices (chapters 7 and 8). A focus on causal structure adds systematic attention to root causes at multiple scales. It identifies the proximate responses to risk, ordinarily conducted via projects and people's own coping arrangements, and attends to the more distant social, political, and economic root causes of vulnerability.

Vulnerability analysis and policy development are only first steps in a multistep iterative governance process. The chapter concludes with a discussion of governance, arguing that to tilt decision making in favor of the poor will require systematic representation of poor and marginal voices in climate decision-making processes.

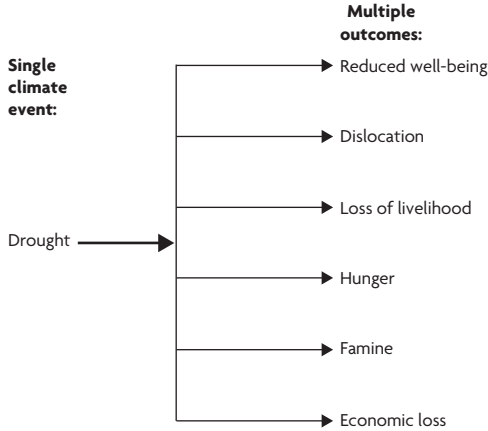
Linking Climate and Society: Theories of Vulnerability

It is widely noted that vulnerability to environmental change does not exist in isolation from the wider political economy of resources use. Vulnerability is driven by inadvertent or deliberate human action that reinforces self-interest and the distribution of power, in addition to interacting with physical and ecological systems.

Vulnerability analysis often is polarized into risk-hazard and social constructivist frameworks (Füssel and Klein 2006; also see O'Brien et al. 2007 and Adger 2006). The risk-hazard model tends to evaluate the multiple outcomes (or "impacts") of a single climate event (see figure 2.1), whereas the social constructivist—or entitlements and livelihoods—approach characterizes the multiple causes of single outcomes (figure 2.2) (Adger 2006; Ribot et al. 1996; Ribot 1995). Integrative frameworks have grown mostly from the entitlements and livelihoods approach, but treat environment as a causal factor.

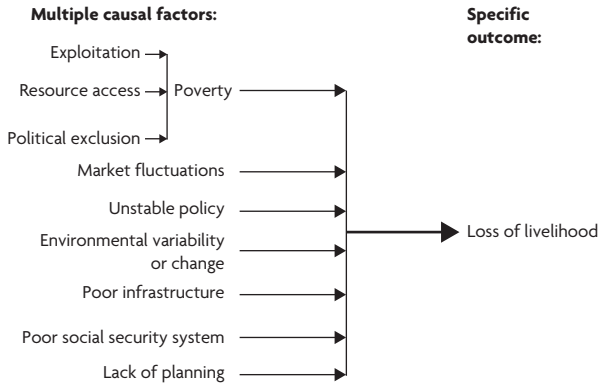
The two archetypal approaches ask different questions. The risk-hazard approach—which defines vulnerability as a "dose-response relation between an exogenous hazard to a system and its adverse effects" (Füssel and Klein 2006, p. 305)—is concerned with predicting the aftermath or "impact" of a given climate event or stress and with estimating the increment of damage caused by an intensification from "normal" climatic conditions to the conditions expected under climate change scenarios. Those who take this approach view people as vulnerable *to hazards*—locating risk in the hazard

Figure 2.1. Impact Analysis



Source: Author's illustration.

Figure 2.2. Vulnerability Analysis



Source: Author's illustration.

itself. This approach usually is portrayed as inadequately incorporating social dimensions of risk (Adger 2006; also see Cannon 2000).

The social constructivists are asking what causes vulnerability. They consider people to be vulnerable to *undesirable outcomes*. They also are concerned with the likely aftermath of a climate event or trend. They view climate events and trends as external phenomena, and view the risk

of disaster and suffering as social. Therefore, they place the burden of explanation of vulnerability within the social system. They locate risk within society. The entitlements and livelihoods approach is described as depicting “vulnerability as lack of entitlements” or a lack of sufficient means to protect or sustain oneself in the face of climate events where risk is shaped by society’s provision of food, productive assets, and social protection arrangements (Adger 2006). The entitlements approach is often depicted as ignoring biophysical factors.

Integrative frameworks link these two views. These frameworks tend to be extensions of social constructivist models, rather than of risk-hazard approaches. Integrative frameworks view vulnerability as depending on both biophysical and human factors. One views vulnerability as having “an external dimension, which is represented...by the ‘exposure’ of a system to climate variations, as well as an internal dimension, which comprises its ‘sensitivity’ and its ‘adaptive capacity’ to these stressors” (Füssel and Klein 2006, p. 306). The Intergovernmental Panel on Climate Change views internal and external aspects as separate dimensions of vulnerability. These notions of internal and external aspects of vulnerability, however, are entirely contingent on how one draws the boundaries of the system under analysis.

Turner et al. (2003; also see Watts and Bohle 1993 and Blaikie 1985) have adopted an approach that avoids this boundary problem by tracing the causes of vulnerability from specific instances of risk—explaining why a given individual, household, group, nation, or region is at risk of a particular set of damages (see figure 2.2). By tracing causality out from each unit at risk, their model views the entire system as one integrated whole. Analyses of vulnerability then must account for all factors—biophysical and social—contributing to the stresses that affect the unit of concern (Kasperson et al. 2005). This causality-based integrative approach to vulnerability informs the available integrative analytic approaches described in the next section. It allows a multiscale, multifactor analysis of vulnerability.

Vulnerability Analysis

Two objectives of any vulnerability analysis for climate action are to identify who is vulnerable and to identify how to assist them. Analysts need to ask, *Where* should we spend public funds earmarked for climate adaptation, and *In what kinds of projects* should we invest in these places? The

first question—how to target expenditures—requires identifying which regions (where), social groups (who), and things of value (what) are vulnerable. The question of what we need to invest in requires an understanding of the characteristics of the vulnerability of these people, places, and things and the reasons (why) they are at risk, so we can assess the full range of means for reducing that vulnerability. The questions *where*, *who*, and *what* are very different from *why*. Knowing where, who, and what tells us how to target expenditures. Knowing why tells us what to modify or improve in those targeted places and communities. *Why* also indicates the complexity and cost of short- and long-term solutions to vulnerabilities associated with climate variability and change.

Although impact assessments of the risk-hazard style can indicate that a place might be affected by a predicted climate change under given static, on-the-ground circumstances (a given level of exposure and ability to respond), they rarely tell us why the places and people or ecosystems are sensitive or lack resilience. Knowing likely impacts can help us target funding to particular places or to particular social groups or ecological systems. It cannot, however, tell us how to spend that money when we get there. Analysis of causes can help direct funds into vulnerability-reducing projects and policies. Climate action should be guided by both types of analysis. Much attention has been given to impact assessment, indicators, and mapping for targeting.⁶ This section trains our attention on the elements of an analysis of causal structure of vulnerability.

The Causal Structure of Vulnerability

The two most common approaches to analyzing causes of vulnerability use the concepts of entitlements and livelihoods.⁷ These approaches analyze the sensitivity and resilience of individual, household, or livelihood systems and, in some instances, the linked human-biophysical system. They tend to bring attention to the most vulnerable populations—the poor, women, and other marginalized groups. These approaches provide a starting point for analyzing the causes of climate-related vulnerability.

Entitlements and Livelihoods Approaches— Putting Vulnerabilities in Place

Sen (1981, 1984; also see Drèze and Sen 1989) laid the groundwork for analyzing causes of vulnerability to hunger and famine. Sen's analysis begins at the household level with what he calls "entitlements." Entitlements are the total set of rights and opportunities with which a household

can command—or through which it is “entitled” to obtain—different bundles of commodities. For example, a household’s food entitlement consists of the food that the household can command or obtain through production, exchange, or such extralegal legitimate conventions as reciprocal relationships or kinship obligations (Drèze and Sen 1989). A household may have an endowment or set of assets, including investments in productive assets; stores of food or cash; and claims they can make on other households, patrons, chiefs, government, or on the international community (Bebbington 1999; Drèze and Sen 1989; Swift 1989). Assets buffer people against food shortage. They may be stocks of food or things people can use to make or obtain food.⁸ In turn, assets depend on the ability of the household to produce a surplus that it can store, invest in productive capacity and markets, and use in maintaining social relationships (Ribot and Peluso 2003; Berry 1993; Scott 1976).

Vulnerability in an entitlements framework is the risk that the household’s alternative commodity bundles will fail to buffer them against hunger, famine, dislocation, or other losses. It is a relative measure of how prone the household is to crisis (Downing 1991; also see Watts and Bohle 1993, Downing 1992, and Chambers 1989). By identifying the components (that is, production, investments, stores, and claims) that enable households to maintain food consumption, this framework allows us to analyze the causes of food crises.⁹ Understanding causes of hunger can shed light on policies to reduce vulnerability (Turner et al. 2003; Blaikie 1985). By analyzing chains of factors that produce household crises, a whole range of causes is revealed. This social model of how climate events might translate into food crisis replaces ecocentric models of natural hazards and environmental change (Watts 1983). By showing a range of causes, environmental stresses are located among other material and social conditions that shape household well-being. Hunger, for example, may occur during a drought because of privatization policies that limit pastoral mobility, making pastoralists dependent on precarious rain-fed agriculture (Smucker and Wisner 2008).

When environment (including climate) is located within a social framework, the environment may appear to become marginalized—set as one among many factors affecting and affected by production, reproduction, and development (see Brooks 2003). But this does not diminish the importance of environmental variability and change. Indeed, it strengthens environmental arguments by making it clear how important—in degree and manner—the quality of natural resources is to social well-being. These

household-based social models also illustrate how important it is that assets match or can cope with or adjust to (that is, buffer against) these environmental variations and changes so that land-based production activities are not undermined by and do not undermine the natural resources on which they depend.¹⁰ Leach, Mearns, and Scoones (1999) later called these environmental inputs to household sustenance “environmental entitlements” (also see Leach, Mearns, and Scoones 1997 and Leach and Mearns 1991).

“Environmental entitlements refer to alternative sets of utilities derived from environmental goods and services over which social actors have legitimate effective command and which are instrumental in achieving well-being” (Leach, Mearns, and Scoones 1999, p. 233). In that definition, these authors make four innovations. First, they expand Sen’s concept of entitlements from an individual or household basis up to the scale of any social actors—individuals or groups. This enables analysis to be scaled to any relevant social unit (or exposure unit, in the case of climate-related analyses)—such as individuals, households, women, ethnic groups, organizations, communities, nations, or regions. Second, they introduce the notion of a subcomponent entitlement, a set of utilities that a particular resource or sector contributes to well-being—for example, environment.¹¹ Their third innovation also draws on Sen to show that “environmental entitlements enhance people’s capabilities, which is what people can do or be with their entitlements” (p. 233). Last, they expand the idea of rights such that things may be “claimed” rather than just legally “owned.” In this framing, claims may be contested—something Sen fails to capture. For example, when hunters close to Mkambati Nature Reserve in South Africa are banned from the reserve by state law, they continue hunting on the basis of customary rights that they view as legitimate. They claim their rights, contesting the state’s claim (Leach, Mearns, and Scoones 1997). Hence, endowments such as natural resources that are not owned classically within a household still can be accessed through social relationships that may introduce cooperation, competition, or conflict mediated by systems of legitimization other than state law. With this insight, the authors introduce the notion that rights Sen takes as singular and static also may be plural (in the manner of Griffiths 1986 and von Benda-Beckmann 1981); and are based on multiple, potentially conflicting, social and political-economic relationships of access (in the manner of Ribot and Peluso 2003 and Blaikie 1985).

Watts and Bohle (1993) also place Drèze and Sen’s (1989) analysis of household entitlements in a multiscale political economy. They argue that

vulnerability is configured by the mutually constituted triad of entitlements, empowerment, and political economy. Here, empowerment is the ability to shape the higher-scale political economy that, in turn, shapes entitlements. For example, democracy or human rights frameworks can empower people to make claims for government accountability in providing basic necessities and social securities (Moser and Norton 2001). Drèze and Sen have observed the role of certain types of political enfranchisement in reducing vulnerability—specifically, the role of media in creating crises of legitimacy in liberal democracies. Watts and Bohle go far beyond media-based politics to show that empowerment through enfranchisement puts a check on the inequities produced by ongoing political-economic processes. Although not outlined in their model, their approach indicates that direct representation, protest and resistance, social movement, union, and civil society pressures can shape policy and political processes or the broader political economy that shapes household entitlements (Ribot 1995). Moser and Norton view mobilization to claim basic rights as an important means for poor people to shape the larger political economy.

Multiple mechanisms link micro- and macro-political economies to shape household assets. Deere and de Janvry (1979) identify mechanisms by which the larger economy systematically drains income and assets from farm households. These mechanisms include tax in cash, kind, and labor (*corvée*); labor exploitation; and unequal terms of trade. These processes make people vulnerable because the wealth they produce from their land and labor is siphoned off—with the systematic support of social, economic, and environmental policies. For example, forestry laws and practices in Senegal have prevented rural populations from holding onto profits from the lucrative charcoal trade (Larson and Ribot 2007), and foresters in Indonesia systematically extract labor from farmers and prevent them from trading forest products while allowing wealthy traders to profit (Peluso 1992). Scott (1976) also shows how peasant households are exploited in exchange for security. Peasants allow their patrons to take a large portion of their product or income in exchange for support during hard times.

Each household is affected by multiscale forces that shape their assets and well-being. Southern African farm households contend with climate variability, AIDS, conflict, poor governance, skewed resource access, and the erosion of their coping capacities. Although food production support is typical of food-security interventions, household-based research shows that food purchase supported by remittances and gifts is more important in enabling households to obtain food. Donors in the region supported

climate early-warning systems, but these systems were found to do little to reduce vulnerability if not coupled with other measures. For example, farmers ask for guidance on specific actions to take, given forecast and warning information. Many farmers lack the capacity or resources (such as credit, surplus land, access to markets, or decision-making power) needed to turn climate information or specific guidance into action. These, then, are the proximate factors that shaped their vulnerabilities (Kasperson et al. 2005). The analyses framed by Watts and Bohle (1993), Deere and de Janvry (1979), and Scott (1976), as well as an analysis of the power and authority hierarchies in which households are embedded (Moser and Norton 2001), would give us insight into the larger political economy that would explain why credit is scarce and market access and representation are so limited.

Like entitlements analyses, livelihoods approaches (Cannon, Twigg, and Rowell 2003; Turner et al. 2003; Bebbington 1999; Blaikie et al. 1994) evaluate multiscale factors shaping people's assets. They build on entitlements approaches, but shift the locus of analysis from the household to multistranded livelihood strategies that also are embedded in the larger ecological and political-economic environment. They also shift attention from a focus on vulnerability to hunger toward an analysis of multiple vulnerabilities, such as risk of hunger, dislocation, and economic loss—a suite of factors closely related to the broader condition of poverty. In these approaches, vulnerability variables are connected with people's livelihoods, where a livelihood is “the command an individual, family or other social group has over an income and/or bundles of resources that can be used or exchanged to satisfy its needs. This may involve information, cultural knowledge, social networks, legal rights as well as tools, land, or other physical resources” (Blaikie et al. 1994, p. 9). Vulnerability in this framing is lower when livelihoods are “adequate and sustainable” (Cannon, Twigg, and Rowell 2003, p. 5). Livelihood models also explicitly link vulnerability to biophysical hazards by acknowledging that hazards change the resources available to a household and, therefore, can intensify some people's vulnerability (Blaikie et al. 1994).

In short, entitlements and livelihoods approaches form a strong basis for vulnerability analysis. They differ in the scale of the unit of concern and analysis (exposure unit) and the scope of factors that analysts view as impinging on that unit at risk—with livelihoods approaches being much broader. When taken together, they provide a powerful repertoire of analytic tools for vulnerability analysts. Both approaches (1) start with the unit at risk;

(2) focus on the avoidable damages it faces; (3) take the condition of the unit's assets to be the basis of its security and vulnerability; and then (4) analyze the causes of vulnerability in the local organization of production and exchange as well as in the larger physical, social, and political-economic environment. Vulnerability analysis differs greatly from the risk-hazard approaches that start with climate events and map out their consequences across a socially static landscape. Entitlements and livelihoods approaches put vulnerability in context on the ground, enabling us to explain why specific vulnerabilities occur at specific times in specific places.

Toward Pro-Poor Climate Action

Vulnerability to hunger, famine, and dislocation are correlated with poverty (Cannon, Twigg, and Rowell 2003; Prowse 2003; chapters 8 and 10 of this volume). Women, minorities, and other marginalized populations are also disproportionately vulnerable, sharing many of the vulnerabilities that poor people experience (chapter 5). For poor and marginalized populations, vulnerability reduction is poverty reduction and basic development (Cannon, Twigg, and Rowell 2003; also see Prowse 2003).

The weak within society tend to be of lower priority for those in power. Economically weak actors in urban slums or marginal groups far from the centers of power within semiarid or forested zones may be of little importance to people holding political office or involved in big business. They are likely to be low priority for governments, even in matters of disaster planning (ICHRP 2008; Blaikie et al. 1994). For instance, the extent to which slum dwellers are affected by extreme weather is a matter both of settlement location and of the level and quality of infrastructure and services such as water, sanitation, and drainage. These populations' lack of assets reduces their ability to adapt to changing conditions and prevents them from making political demands for investments to reduce their risk (chapter 9).

To counter biases against the poor and marginalized, vulnerability analyses and policies must be pointedly pro-poor. This section outlines an approach to pro-poor vulnerability analysis and a research agenda for identifying vulnerability reduction policies.

Pro-Poor Vulnerability Analysis

Entitlements and livelihoods approaches evaluate the causes of asset failure and of negative outcomes to identify means to counter the causes (Turner

et al. 2003; Ribot et al. 1996; Ribot 1995; Watts and Bohle 1993; Downing 1991). This focus on negative outcomes favors poor and marginalized groups because they are overrepresented in at-risk populations. This tilt in favor of the poor also may be enhanced, of course, by analytic efforts that choose to study outcomes of most concern to the poor—outcomes such as hunger, dislocation or economic losses that push people over a threshold into poverty or extreme deprivation. The focus on causality can point toward solutions.

Coping and adaptation¹² studies identify vulnerability reduction strategies used by poor and marginalized populations and the means to support those strategies. Agrawal (chapter 7), for example, starts with household and community risk-pooling strategies and identifies institutions—civic, private, and public organizations—that support these strategies. His analysis gives insight into the roles of institutions (by which he means “organizations”) and therefore into potential institutional channels for coping and adaptation support. Although this approach does not explain why people become vulnerable, it provides great insight into local-level vulnerability management and reduction.

Whereas analysis of coping or adaptation strategies can offer insight into causes of vulnerability, the entitlements and livelihoods approaches analyze the causal structure of vulnerability to identify a wider range of coping and adaptation opportunities (Yohe and Tol 2002; Mortimore and Adams 2001; Watts 1983; chapter 8). Coping approaches, as well as many project-based interventions, focus on means for adapting as well as on causes of adaptation and the ability to adapt. The vulnerability approach seeks to identify causes of the vulnerability—that is, causes of the risks to which people need to adapt.¹³

Tracing the causes of negative outcomes complements coping and adaptation approaches by enabling researchers and development professionals to conduct a full accounting of causality. Such a full accounting can indicate the policy options available for reducing vulnerability at its multiscale origins, rather than focusing only on coping or adapting in the face of hazards and stress (which tend to be responses to the most-proximate factors). For example, despite laws transferring forest management to elected rural councils in Senegal, foresters force councilors to give lucrative wood-fuel production opportunities to powerful urban merchants—usually leaving the rural populations destitute (Larson and Ribot 2007). Forest villagers continue to rely on low-income rain-fed farming, and must cope with meager incomes. By focusing on the causes of destitution that put forest villagers on the margins, analysts might recommend means of policy

enforcement rather than encouraging villagers to market other secondary forest products (as many projects are doing).

Vulnerability analysis most useful to policy makers starts from the outcomes we wish to avoid and works backward to the causal factors (Turner et al. 2003; also see Füßel 2007; Downing 1991; Blaikie 1985). In addition to favoring the poor, focusing on outcomes and their causes has other advantages: (1) it best matches policy to valued attributes of the system that we wish to protect; (2) it enables policy makers to place hazards as one variable among many affecting those attributes; (3) it brings attention to the many variables at multiple scales affecting valued attributes, steering analysts toward the many possible means for reducing the probability of negative outcomes or enhancing positive ones; (4) it enables comparative analysis of the many causes of negative outcomes, helping to focus policy attention on the causes that are most important, most amenable to reforms, and least costly to change—giving policy makers the biggest bang for their buck. Analyzing chains of causality (for example, Blaikie 1985)—by showing how outcomes are caused by proximate factors that, in turn, are shaped by more distant events and processes—can tell us what kinds of interventions might stem the production of vulnerability at what scales and, where relevant, who should pay the costs of vulnerability reduction.

Vulnerability reduction measures, of course, do not derive only from understanding causes. Indeed, some causes may be (or appear) immutable; others, transient, incidental, or no longer active. The objective of vulnerability analysis is to identify the active processes of vulnerability production and then to identify which are amenable to redress. Also identifiable are other interventions designed to counter conditions or symptoms of vulnerability without attending to their causes (such as support for coping strategies or targeted poverty reduction disaster relief). All forms of available analysis should be used to discover the most equitable and effective means of reducing vulnerability.

Identification of Multiscale Vulnerability Reduction Policies

Studies of coping strategies and lessons from successful development interventions provide valuable guidance for vulnerability reduction. Large-scale causes of vulnerability (such as unequal development practices), however, are less likely to receive attention in poverty reduction, vulnerability reduction, or adaptation programs. Identifying and matching solution sets or climate-related opportunities with responsive institutions at appropriate scales of social, environmental, and political-administrative organization

provide an entry point into multiscale pro-poor climate action. Such action requires a systematic understanding of both proximate and distant dynamics that place people under stress or on the threshold of disaster. This section proposes a research agenda for identifying the range of causal factors shaping various vulnerabilities for groups at risk around the world, and a mapping of those causes onto solution sets for responsible and responsive institutions.

Different outcomes that we hope to avoid—such as loss of assets, livelihood, or life—are risks for different subgroups, and they have different associated causal structures. Different sectors will face different stresses and risks, and will have different response options (Parry et al. 2007). Within each case, the vulnerability of the poor (who have few resources to shield themselves or rebound from climate events and stresses) will be different from vulnerability of the rich (who are able to travel to safety and draw insurance to help them rebuild). Local, national, and international policies can be developed from an understanding of differences in the causal structures of vulnerabilities. Explaining differences will require an analysis of the multiple causal factors for a variety of vulnerabilities of concern. These causal data then must be aggregated to evaluate the best point of leverage for vulnerability reduction with respect to specific vulnerabilities and overall. Such an analysis should reveal the frequency and importance of different causes, pointing toward strategies to address the most salient and treatable causal factors.

Identifying the causal structure of vulnerability and potential policy responses can be a basis for developing a broad vulnerability reduction strategy. It involves aggregating causal structures over multiple cases of vulnerability among particular groups in particular areas to specific outcomes. This aggregation may have to be broken down by sector, ecozone, or hazard area to make the exercise manageable. The case studies also can serve as the basis for generating recommendations for local policy. More broadly, multiple case studies may help us comprehend the relative importance of different factors—both near and far—in producing and reducing vulnerability. These factors must be aggregated to identify the relevant scales and corresponding institutions for climate action. These steps set out a major research agenda for vulnerability reduction analysis. For this agenda to counter the biases against poorer populations, all of these steps must be consciously pro-poor. For example, the cases where such basic human rights as health, livelihood, and life are at risk must take priority over analysis of purely economic losses.

Indicators currently used to target poverty and vulnerability reduction interventions are a good starting point for identifying relevant study populations. Existing livelihoods approaches to vulnerability reduction already target the poor: strengthening their baseline nutrition, health, and morale; and addressing the underlying conditions of poverty, thus reinforcing their abilities to confront stressors and bounce back (Cannon, Twigg, and Rowell 2003). Vulnerability studies complement successful “self-help” and “social protection” coping and adaptation supports by indicating opportunities for higher-scale reforms (see chapter 10).

Thorough vulnerability analyses would indicate the need to reform the larger political economy of institutions, policies, social hierarchies, and practices that shape well-being, capacity for self-protection, and extended entitlements. For example, although social funds, community-driven development, and social safety nets are excellent means for responding to poor populations’ immediate stresses and needs, examining causality through historical studies often reveals that the poverty these programs respond to is the result of larger-scale, uneven development investment decisions and governance policies that limit the choices available to those affected by environmental disasters (chapters 4 and 10).

Vulnerabilities and their causes are diverse. Responses to vulnerability must be developed from detailed understandings of specific problems in specific places—general principles and models are insufficient. Case studies inform us of a particular set of dynamics and opportunities for vulnerability reduction in a particular place. It is from case studies that viable solutions can follow—both for specific places and more generally. To be complete, place-based approaches must take into account people’s detailed knowledge of their social and production systems and the risks they face—experience with community-driven development teaches this lesson (Mansuri and Rao 2004). To make results of an analysis relevant and the implementation of recommendations feasible, investigations of vulnerability must consider local people’s needs and aspirations and their knowledge of political-economic and social context in which any policy will have to be inscribed into law and translated into practice. Thus, although studies provide perspectives that communities may not be able to generate, the steps in developing a policy strategy for reducing vulnerability must be informed and open to influence by local citizens and their representatives.

Any vulnerability case study should include an evaluation of existing vulnerability reduction policy as well as a wide range of sectoral and regulatory policies (Burton et al. 2002). Existing policies deeply affect any

given population at risk. Some policies are aimed at assisting them. Some may reduce vulnerability, and others help produce conditions of vulnerability. Policies, like institutions or organizations (as Agrawal suggests in chapter 7), can enable coping. They may also be systematically disabling (see Larson and Ribot 2007). Policies or their unequal implementation may selectively favor some actors and make others more vulnerable. Policies from all sectors have deep distributional implications. Coudouel and Paternostro (2005) and the World Bank's Poverty and Social Impact Analysis user's guide¹⁴ suggest methods for analyzing the distributional effects of public policies. Such guidelines also can be applied to evaluating the vulnerability implications of policies and interventions.

When exploring the effects of policies and practices that shape vulnerability, or when analyzing potential vulnerability reduction measures, it is also important to account for a wide range of ancillary benefits (Burton et al. 2002). For example, in urban areas, asset building not only reduces immediate vulnerability, but also enables poor and middle-income people to make demands on their government for better services and infrastructure (chapter 9). Most adaptation measures will go far beyond reducing risk with respect to climate events. Hence, the set of benefits that follows from a given set of vulnerability reduction measures is also highly relevant in deciding the allocation of funds earmarked for development or for climate-related vulnerability.

Knowledge of problems and policy guidance can inform popular mobilization and policy making. Proposing policy solutions, however, is a small part of the political struggle for change. Calls for change must be backed by political voice and leverage. Bringing poor and marginalized groups into decision making through organizing or representation can reinforce their claims for justice, equity, and greater security in the face of a changing environment (Ribot 2004; Moser and Norton 2001).

Conclusion: From Climate Action Options to Institutions and Governance

Whereas vulnerability is always experienced locally, its causes and solutions occur at different social, geographic, and temporal scales. Identifying the causes of vulnerability points toward vulnerability reduction measures and the scales at which they best may be implemented. It also helps attribute responsibility to the polluters—providing a basis for compensation.¹⁵ Vulnerability reduction or compensation policies are

developed, promulgated, and implemented through institutions. So are the many other sectoral, economic, and social policies that have implications for vulnerability via their effects on resource access, market access, political voice, poverty, and economic distribution. Institutions also play numerous roles in supporting people's everyday coping and livelihood strategies (chapter 7). Systematically determining causes of vulnerability, identifying policy solutions, and mapping them to scales and appropriate institutions are three steps in a process that vulnerability reduction analysts and activists yet must conduct.

Institutions play several important roles in well-being and vulnerability. Leach, Mearns, and Scoones (1999) view institutions as mediating vulnerability by shaping access to resources (a part of endowment formation), the relationship between endowments and entitlements (rights and opportunities with which a household may command different commodity bundles), and the relationship between entitlements and capabilities (the range of things people may do or be with their entitlements). In their model, institutions enable people to obtain, transform, and exchange their endowments in ways that translate into contributions to well-being. As such, institutions support the needs of a plurality of subgroups, who can enter into competition and conflict when making claims to resources.

Agrawal (chapter 7) also emphasizes the role of institutions, showing how rural institutions structure risk and sensitivity in the face of climate hazards by enabling or disabling individual and collective action. Rural populations protect themselves by risk pooling via storage (over time), migrating (over space), sharing assets (among households), and diversifying (across assets). Exchange (via markets) can substitute for any of these risk-pooling responses. Rural institutions play a role in enabling each of these risk-reducing practices. In the 77 case studies Agrawal analyzes in his chapter, all of these practices depend on local institutions—mixes of public, civic, and private organizations.

Risk-pooling and exchange mechanisms constitute one set of practices that shapes vulnerability. Many other practices also produce or reduce climate-related vulnerabilities. Drèze and Sen (1989), for example, explore the role of media in influencing policy to prevent and respond to chronic hunger and famine. Leach, Mearns, and Scoones (1999) focus on the role of resource access, endowment formation, and entitlement mapping—the kinds of processes that might occasion the actors involved not to need to engage in risk pooling. Heltberg, Siegel, and Jorgensen (chapter 10) point to social protection interventions. Cannon, Twigg, and Rowell (2003) examine the role of networks (akin to Sen's 1981 extended entitlements);

Bebbington (1999) emphasizes social capital; Scott (1976) focuses on reciprocal relationships within a moral economy; Deere and de Janvry (1979) outline mechanisms by which economic gains are coerced or extracted from peasant households; and Moser and Norton (2001) emphasize the role of human rights and claim making.

Each of those enabling and disabling practices depends on different kinds of institutions—rules of the game and public, private, or civic organizations—at various scales. To map vulnerability-producing and vulnerability-reducing practices to institutional nodes for intervention, Agrawal's analytic approach to risk pooling could also be applied productively to each of these other practices. Each can be studied for its role in the causal structure of vulnerability. Each practice—whether reciprocity or social protection—depends on institutions that, when identified, can be targeted for reform or support. But attempting such interventions may generate social and political tension. As Leach, Mearns, and Scoones (1999) indicate, institutions and their networks may be in competition or conflict—some for enabling and others in support of disabling policies and practices.

The institutions responsible for and capable of responding to vulnerability are the loci of vulnerability governance. Governance (following World Bank 1992 and Leftwich 1994) is about the political-administrative, economic, and social organization of authority—its powers and accountabilities. It is about how power is exercised, and on whose behalf. As the global climate warms, decisions will be made at every level of social and political-administrative organization—from global conventions to the decisions of local governments, village chiefs, or nongovernmental organizations—to mitigate climate change, take advantage of its opportunities, and dampen associated negative consequences. Multiple decisions at multiple scales affect the livelihoods of urban and rural poor people. What principles of governance should guide decisions at each of these decision-making nodes? Who will decision-making bodies represent, and how? What distributions of decision-making powers and what structures of accountabilities will provide the most leverage for positive change and the checks and balances to protect poor urban and rural people's basic well-being and rights? These questions remain open.

Principles to govern climate action must be designed around the processes that shape vulnerability and the actors and organizations with authority and power to make decisions that can change these processes. The first step will be aggregating case-based analyses of causality, coping,

and the role of institutions. That process can be tilted in favor of poor and marginalized populations by analyses that explain causes of asset and entitlement failure. To translate learning into action will be a long-term iterative process to negotiate the reshaping of policies and practice. All policies change distribution and, therefore, have advocates and meet resistance. Decision-making processes that are accountable and responsive to affected populations at least may tilt policies to favor the most vulnerable—because of their sheer numbers. Such a focus will promote the development of and engagement with representative decision-making bodies to ensure a modicum of influence by those people who are most in need.

For researchers, representation might mean incorporating the voice of local populations in their understanding of who is at risk, the problems at-risk groups face, and possible solutions, as well as sharing findings with affected populations and policy makers. For development professionals and policy makers, it will mean working with representative bodies and insisting that these bodies incorporate local needs and aspirations into the design of projects and policies. In global negotiations, it may mean requiring negotiators to engage in public discussions within their countries, or requiring national groups to organize and monitor their nation's negotiators. In local and national contexts, it may mean helping mobilize the poor and marginalized to make demands and to vote. Such governance practices may help avoid negative outcomes of climate action, and they could make climate action more legitimate and sustainable. Representing and responding to the needs of the most vulnerable populations might promote development that can widen the gap between climate and distress. Moving people away from the threshold of destitution by building their assets, livelihoods, and options will dampen their sensitivity, enhance their flexibility, and enable them to flourish in good times, sustain through stress, and rebuild after shocks.

Notes

1. For instance, this could occur if adaptations or mitigation efforts (such as reduced emissions from deforestation and decreased degradation) increase inequality within or among regions or social groups (O'Brien et al, 2007).
2. This trend holds, even without counting the 2004 Indian Ocean tsunami. Twice as many people were affected adversely by climate events in the 1990s as in the 1980s; and over the past four decades, major catastrophes have

- quadrupled while economic losses have increased tenfold (Kasperson et al. 2005, pp. 151–52).
3. Like the storms in Bangladesh, Hurricane Katrina was a category 3 storm. Katrina's surge was 4 meters. Sidr was comparable to Katrina, which devastated New Orleans, Louisiana. But despite infamous Bush administration mismanagement, Katrina resulted in 1,300 fatalities (White House 2006).
 4. The term "adaptation," although common in climate discussions, is highly problematic. It naturalizes the vulnerable populations; it implies that, like plants, they should adjust to stimuli. The term implicitly places the burden of change on the affected unit rather than on those causing vulnerability or bearing responsibility (for example, government) for helping with coping and enabling well-being. "Adaptation" also suggests "survival of the fittest," which is not a desirable ethic for society.
 5. The U.S. National Research Council (Ramanathan, Justice, and Lemos 2007), the Intergovernmental Panel on Climate Change (Solomon et al. 2007), and the 2006 *Stern Review* all acknowledge the need for greater social science analysis.
 6. On mapping and targeting, see Adger et al. (2004); Deressa, Hassan, and Ringler (2008); Downing (1991); and Kasperson et al. (2005).
 7. For reviews of vulnerability approaches, see Adger (2006), Füssel and Klein (2006), and Kasperson et al. (2005).
 8. According to Swift, "Assets create a buffer between production, exchange and consumption" (1989, p. 11).
 9. An entitlements framework is very useful, but grossly incomplete—covering only a limited set of causes. For an analysis of its limits, see Gasper (1993).
 10. Household models often are limited by their failure to account for intrahousehold dynamics of production and reproduction—but they do not have to be so limited. See, for example, Agarwal (1990), Carney (1988), Guyer (1981), Guyer and Peters (1987), Hart (1992), and Schroeder (1992).
 11. This second innovation can be confusing because environmental claims in Sen's (1981) classic entitlements framework could be considered part of people's "rights and opportunities," and the alternative sets of utilities these can become would be part of the alternative commodity bundles people can command. Nevertheless, it is useful to view environment as contributing to people's endowments and alternative commodity bundles.
 12. Coping is a temporary adjustment during difficult times, whereas adaptation is a permanent shift in activities to adjust to permanent change (Davies 1993; also see Yohe and Tol 2002).
 13. Yohe and Tol (2002) focus on the determinants of adaptive capacity, but seek to identify causal structures rather than the causes of vulnerability.
 14. The user's guide is available at http://siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/12685_PSIUsersGuide_Complete.pdf.

15. Füssel (2007) identifies three fundamental responses for reducing negative outcomes associated with climate change: mitigation, adaptation, and compensation. Mitigation assumes climate to be the major cause of problems. Adaptation and compensation require analysis of causality to identify a broader range of responsible factors and institutions.

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