

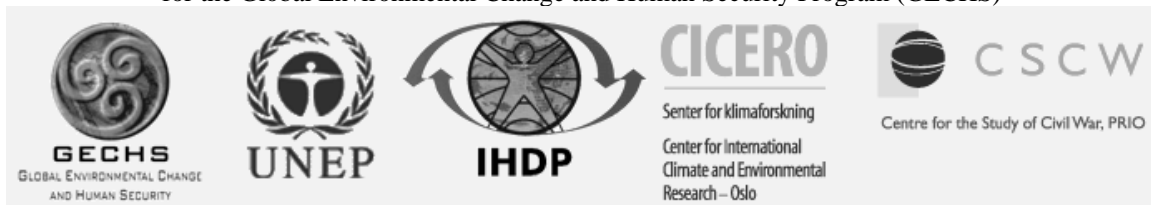
# Climate Change, Equity and Human Security

Karen O'Brien and Robin Leichenko  
University of Oslo, Norway and Rutgers University, U.S.A

**Human Security and Climate Change**  
An International Workshop  
Holmen Fjord Hotel, Asker, near Oslo, 21–23 June 2005

Organizers:

Centre for the Study of Civil War, International Peace Research Institute, Oslo (PRIO) &  
Centre for International Environmental and Climate Research at the University of Oslo (CICERO)  
for the Global Environmental Change and Human Security Program (GECHS)



## **Abstract**

Climate change is increasingly described as an issue of equity that has implications for human security. Yet to date, equity concerns have been largely framed as a North-South issue relevant to debates about climate change mitigation, development and sustainability. Human security issues, in contrast, have largely been framed in terms of conflict or cooperation, rather than in terms of “Whose security is at stake, and why?” In this paper, we emphasize that climate change equity is not simply a North-South issue, but an issue that cuts across national boundaries and needs to be addressed at different scales and units of analysis. We show that inequities associated with the drivers, impacts, and responses to climate change are linked not only to existing inequities, but to new inequities generated by climate change. We emphasize that recognition of climate change as an issue of equity that selectively undermines human security of some regions and groups is essential to addressing the underlying factors that drive processes, influence outcomes, and condition responses to climate change.

## **1. Introduction**

Over the past two decades, climate change has been presented as a global issue resulting from an increase in greenhouse gas emissions linked to human activities. Framed in relation to changes in the dynamic Earth System, climate change is frequently presented as a problem that, once scientific uncertainty decreases and knowledge of the impacts are understood, can be managed through behavioral and technological changes. Despite frequent references to inter-generational equity in these discussions, climate change is only beginning to be framed as primarily an issue of equity (Kemfert and Tol 2002; Tonn 2003; Brown 2003). Yet even within these equity-based analyses, the focus is typically limited to questions of equity in mitigation of greenhouse gas emissions. Relatively less attention is paid to equity in impacts and adaptation, and there is virtually no mention of the connections between climate change, equity and issues of human security (Müller 2002; Adger 2004).

In spite of limited attention to questions of equity in impacts and adaptation, there is widespread recognition that the effects of climate change are likely to be highly uneven, with some individuals, households, communities, or regions experiencing significant negative effects, such as the loss of life and property due to climate extremes, the loss of agricultural productivity, increased water stress, damage to infrastructure from the melting of permafrost, and so on (Adger 2004). Others may experience only minor negative effects or may be able to successfully adapt to changing environmental conditions. Still others may experience net benefits, such as lower winter heating costs due to warmer temperatures, a longer agricultural growing season, increased forest productivity, or an expansion of tourism due to land use changes. These inequities in impacts and adaptive capacities suggest that global environmental change is likely to create both winners and losers (O’Brien and Leichenko 2003; Leichenko and O’Brien 2005).

If all humans were contributing equally to climate change, the emergence of winners and losers might be considered an inevitable outcome of human development. However, all humans are *not* contributing equally. The drivers of global environmental change—such as fossil fuel consumption, urban and coastal development, industrialization, deforestation, and other land use changes—are also inequitable and can be disproportionately attributed to some nations, regions, and social groups. In general, higher consumers of energy are making a more substantial contribution to climate change than are lower energy consumers. Moreover, all humans do not have an equal voice—or in some cases any form of representation—in key decisions about energy usage patterns, land use changes, industrial emissions, and so forth even though these decisions affect the integrity of the ecological systems on which all humans and all other species depend.

Equity concerns are thus central to climate change, and clearly linked to human security for some regions and groups. The implications of inequities related to climate change for human security have not, however, been systematically considered. To date, equity concerns have been largely framed as a North-South issue relevant to debates about development and sustainability (Agyeman et al. 2003). Human security issues, in contrast, have largely been framed in terms of conflict or cooperation. Framing climate change as an equity issue involves, first and foremost, a recognition of the differential consequences for human security, particularly for regions or social groups that are more vulnerable to climate changes. Furthermore, it involves acknowledging that equity-based responses or “solutions” to climate change may require different approaches than responses that address the science alone. When framed in terms of equity, climate change is transformed into an issue of differential vulnerability that draws attention to some key questions, such as “Whose security is at stake, and why?” and “How can equity issues be resolved when addressing climate change?” (GECHS 1999; Leichenko and O’Brien 2005).

In this paper, we discuss how climate change raises equity issues that will have both direct and indirect effects on human security. In the following section, we discuss some general definitions and interpretations of equity, emphasizing that equity has both procedural and distributional components. In the third section, we explore some of the recent literature that addresses equity in relation to climate change, and we consider related procedural and distributional equity issues. We emphasize here that equity is not simply a North-South issue, but it is an issue that cuts across national boundaries and needs to be addressed at different scales and units of analysis (Leichenko and O’Brien 2005). We conclude by discussing the direct and indirect implications of inequities associated with climate change for human security.

## **2. What is equity?**

The notion of equity is re-emerging as a central theme in discussions of the current global situation, encouraged by dissatisfaction over some of the current and projected outcomes associated with globalization and global environmental change. The forthcoming U.N. Report on the World Social Situation (U.N., 2005) argues that rising inequalities, both among and within countries, should not be considered with equanimity, and that growing

inequities related to income and wealth, opportunities, access, political participation, and influence have profound implications for development, peace and security.

Nevertheless, equity is a term that has many meanings and interpretations. To describe climate change as an issue of equity, it is first necessary to clarify what we mean by equity. In a very general sense, the concept of equity is associated with the freedom from bias or favoritism, or something that is fair to all concerned. The idea of equity is often closely related to justice. Rawls (1971), for example, correlates justice with fairness, which is essentially equal treatment for equal cases. While there are many scholarly debates about the relationship between equity and justice, it is clear that equity is a key component of social justice, where the term “social justice” includes both fairness and equity in the distribution of a wide range of attributes (Rawls 1971; Smith 1994; Ikeme 2003).

One important distinction to note is that equity does not necessarily imply equality in the distribution of attributes or outcomes. As Boulding (1978, page) notes, “Equality in an absolute sense would be advocated by nobody. On the other hand, it is very clear that there are degrees of inequality in a society which threaten its legitimacy and stability.” These varying degrees of inequality in a society are reflected in some of the different interpretations of equity. Equity is influenced by the availability and access to opportunities, which in some cultures is closely linked to the notion of meritocracy, where “inequality is accepted if everyone has had equal opportunity at initial allocation and differentials is only accounted for by difference in effort and hard work” (Ikeme 2003, p. 199). Equity is also associated with the full realization of human potential, which “may be much more a function of the average wealth and status of the society than it is of any internal distribution” (Boulding, 1978, page). Equity has also been approached through the “no envy” principle, represented by an equal opportunity of consumption, whereby no agent would prefer someone else’s “bundle of consumption” to his or her own (Ikeme 2003). This contrasts with the minimum standard or basic need approach, which addresses the needs of the poorest of society. Finally, equity is reflected in the concept of “just deserts,” which seeks remedies in proportion to the weight of the injustice, and ensures that remedy to one injustice should not engender a second injustice. Regardless of how equity is interpreted, there is a consensus among political philosophers and social scientists that more equality in a society is better than less equality (Smith 1994).

While social equity has long been an issue of discussion and debate, concern about environmental equity has emerged as a major area of study only in the past few decades. Two areas of research that devote considerable attention to equity are environmental economics and environmental policy, both of which emphasize the linkages between equity and fairness in the search for appropriate responses to environmental problems. Environmental economics has paid considerable attention to equity issues, with particular emphasis on intergenerational equity, discounting, and issues related to scale and aggregation (Rose et al. 1998; Dore and Mount 1999; Toth 2000). As noted by Rose and Kverndokk (1998, 4) within the context of environmental economics, “Equity is not only a normative concept, but a positive one. That is, equity is worthy of pursuit not only

because of fairness, but because it may enhance the likelihood of agreement between parties.” Within the environmental policy literature, equity concerns arise not only in relation to the outcomes, such as the distribution of environmental externalities, but also through the process of developing fair policies: “Equity is not just about how societies distribute resources. It is also the basis for generating social capital necessary, alongside economic, natural, and intellectual capital, for sustainability.... Fairness is integral to the establishment and maintenance of social relations at every level from the micro to the macro, from the local to the global” (Rayner and Malone 2001, p. 199).

Research on gender and environment also provides critical analyses of gender-differentiated contributions, impacts, and responses to global environmental change, with equity issues as a recurring theme. Studies on gender and environment have shown how gender mediates the use of the environment through roles, responsibilities, expectations, norms, and the division of labor, including livelihood strategies (Seager and Hartmann, 2004). Gender-related equity concerns arise in relation to all aspects of climate change, including the driving forces, the impacts or consequences, and the responses (Skutch 2002; Cutter 1995a). Women in particular have been identified as disproportionately vulnerable to the consequences of climate change as the result of unequal access to and control over resources (Denton 2002).

Perhaps the most relevant area of research that addresses equity issues is environmental justice. Within this literature, the terms ‘justice’ and ‘equity’ are often used interchangeably (Ikeme 2003; Kütting 2004). The environmental justice literature initially focused on the location of hazardous industrial waste sites in advanced countries, demonstrating that these sites tended to be disproportionately located in areas where poor and minority residents live (Cutter 1995b; Cutter and Solecki 1996). However, the idea of environmental justice is increasingly being applied in an international context to address issues including the disposal of hazardous wastes in developing countries and the effects of consumption in advanced countries on the environment in developing countries (Ikeme 2003; Agyeman et al. 2003; Leichenko and Solecki 2004a). Rees and Westra (2003, 110) in discussing the linkages between consumption patterns and environmental justice comment that “consumption by the world’s wealthy causes much ecological destruction around the world, but . . . distance and wealth insulate the rich from the negative consequences of their consumer lifestyles.”

An important insight from the environmental justice literature is the distinction between different types of environmental equity, including outcome equity and process equity (Cutter 1995b). Outcome equity entails equitable (i.e., random) distribution of environmental hazards or environmental amenities, while process equity entails an equitable procedure for deciding both where to site environmental hazards (or amenities) and on production of the burdens that require distribution (Lake 1996; Leichenko and Solecki 2004a). More recently, the environmental justice movement has appealed to both “justice as outcome” and “justice as recognition,” with the latter referring to “the right to be heard in debates and to have a fair influence on decisions” (Adger 2004, p. 1713). As discussed in the next section, a definition of equity that includes outcome (distributional) and process (procedural) considerations is useful when considering equity issues

associated with multiple aspects of global environmental change, including the processes driving these changes, the impacts of these changes, and responses intended to either mitigate climate change or adapt to global environmental.

### **3. Framing Climate Change as an Equity Issue**

Many arguments can be made to support the contention that the collective security of humankind is at risk as the result of climate change. Indeed, changes to ocean currents, rapid sea level rise, and other catastrophic events could have global consequences. Yet it is increasingly evident that not every “global citizen” equally contributes to climate change, and/or will be equally affected by climate change. While climate change mitigation has already raised many equity-related issues related to international negotiations to reduce greenhouse gas emissions, equity perspectives on climate change drivers, impacts and adaptations are also beginning to frame international debates about climate change (Brown 2003; Ikeme 2003; Adger 2004). This can be seen through the emerging “climate justice” movement within civil society, which is an increasingly visible force for action on climate change (Pettit 2004). This movement seeks to link climate change and human development, presenting the issue in the language of rights and focusing attention on inequitable economic relations (Athansiou and Baer 2002; Pettit 2004).

Climate justice inevitably demands a distinction between different types of equity. Adger (2004) identifies several aspects of equity related to climate justice. The first relates to welfare, such as the impacts of climate change on human health and material well-being. The second relates to the right to avoid increased impacts, or the right to development pathways unconstrained by new climatic risks (Adger, 2004). From a distributional standpoint, equity in outcomes would require that each individual, household, social group or region might have an equal chance of either benefiting or being harmed by global environmental change. From a process perspective, equity would require that those groups that are affected by global environmental change have a voice in debates about policies and responses, including a voice in decisions about the processes that are causing global environmental change. These multiple facets of equity can be seen in debates about mitigation, impacts, and adaptation in relation to climate change.

#### *Equity in Climate Change Mitigation*

Much of the discussion of equity and climate change focuses on issues associated with climate change mitigation. Within these discussions, there is a growing consensus that equity is prerequisite for success at reducing GHG emissions. Brown (2003, 233), for example, suggests that we need to take equity into account in order to arrive at a unified strategy for responding to global warming: “the nations of the world are only likely to agree on equitable sharing of the burdens and benefits of protecting the global environment if they feel they are being treated fairly... equity is an indispensable element to a global solution to climate change.” Adger (2004, 1714) makes a similar argument regarding acceptance by developing countries of post-Kyoto emissions targets: “Without

regard to justice as outcome and justice as recognition, there is little prospect of these countries accepting post-Kyoto emissions targets.”

Within the context of international negotiations on climate change emissions, a key process-related inequity entails differential negotiating capacity across countries. While some countries are able to send delegations consisting of dozens of lawyers and diplomats to the Kyoto negotiations, other countries could only afford to send single-person delegations with limited experience and expertise on international negotiations on climate change (Gupta 2000). From a distributional equity standpoint, a critical issue for climate change emissions targets is the perception of equity in outcomes. The Kyoto Protocol’s approach to mitigation via reduction of emissions of greenhouse gases (GHG) is based on an implicit equity principle of “common but differentiated responsibilities” (Tonn 2003, 297). This means that countries that are most responsible for emitting GHG and most able to pay the costs of reducing GHG emissions are expected to bear most of the responsibility for reducing GHG emissions (Ringuis et al. 2000; Tonn 2003, 298). Yet many nations perceive the outcomes of Kyoto to be inequitable. The U.S, for example, argues that Kyoto is inequitable because developing countries are excluded from emissions limitations. At the same time, developing countries argue the opposite, that Kyoto is inequitable because it keeps emissions higher in developed countries, thereby perpetuating economic inequalities (Tonn 2003, 297).

While equity debates about climate change mitigation have emphasized process-related issues such as differential negotiating capacity across nations, process equity considerations among different groups within nations are also relevant. Questions arise, for example, about who has a voice in national decisions about emissions targets? And who decides how emissions targets are met? Because Kyoto is negotiated between national governments, the agreement does not necessarily take into account the views of dissenting or marginalized groups within different nations. In many cases, these groups have a limited voice at the national level in either decisions about emissions targets or plans for mitigation. In the United States, for example, the resistance to the Kyoto agreement at the federal level belies significant support for reduction of GHGs within many communities (Slocum 2004b). The state of California recently decided to pursue greenhouse gas emissions reductions in accordance with the Kyoto protocol. In fact, a number of U.S. city governments have adopted their own policies to reduce GHG emissions as a result of dissatisfaction with the U.S. position on Kyoto (Slocum 2004a).

Concerning distributional equity in the context of Kyoto, questions arise about who pays the costs and who bears the burdens for emissions reductions. These types of equity issues arise, in part, “because of the qualitative differences in the effects of climate change and climate change policy on the poor and those who are better off” (Rayner and Malone 2001, p. 178). In less developed countries, GHG mitigation may create restrictions on the use of certain types of fuel, such as wood in urban areas, which differentially affects poor residents. Within more affluent countries, GHG mitigation may entail requirements for lower emission vehicles. Such vehicles are typically newer and more expensive, making them harder to afford for lower income groups. As with other efforts to reduce air pollution and increase energy efficiency, middle and higher income

consumers are often more easily able to make lifestyle adjustments to meet these requirements than are poorer consumers.

Another equity-related limitation of the Kyoto agreement is that it does not address issues of inter-generational equity including obligations of fairness, maintaining options, and ensuring quality of life (Tonn 2003). Fairness requires not imposing risks on future generations that present generations would deem unacceptable. Maintaining options entails keeping the future world as free of human-made constraints as possible. Quality of life implies ensuring that future generations enjoy the most important aspects of life such as “peace and security, a healthy environment, a small risk of preventable catastrophe, stable governance, conservation of knowledge, a good life for children, and opportunities for living (Tonn 2003, 300). An alternative, equity-first framework based on the premise that every person should have an equal share of the world’s allowable GHG emissions has been proposed, with ‘allowable’ defined as a level of emissions that would not lead to unacceptable consequences (Athanasίου and Baer 2002; Tonn 2003). This rights-based approach, which is based on a principle of equity as equality, attempts to address both present and intergenerational questions of distributional equity.

#### *Equity in Climate Change Impacts and Adaptation*

Despite the emphasis on inequities associated with mitigation of climate change, it is the inequities in impacts of climate change that perhaps raise more critical concerns for human security. As noted by Müller (2002, p. 4), “The cardinal climate change inequity is consequently not the potentially unfair allocation of mitigation targets but the inevitably unfair distribution of climate impact burdens.” If there were a sufficient “veil of uncertainty” – to paraphrase Rawls (1971) -- as to who would benefit from climate change and who would experience losses, a convincing argument could perhaps be made to suggest that the outcomes of climate change are just. However, a just outcome is dependent upon the outcomes being randomly distributed across regions, sectors, social groups, and ecosystems. In reality, outcomes are neither random, nor determined by physical factors (e.g., magnitude of drought) social factors (e.g., education or income) or individual factors (e.g., behavior or initiative) alone. Instead, differential outcomes that result from processes of climate change are generated, in large part, by combinations of inequitable social, economic, environmental, and political conditions (O’Brien and Leichenko 2000; 2003; Leichenko and O’Brien 2005).

Research on climate change vulnerability has contributed to a better understanding of equity issues in climate change impacts and adaptations (Kasperson et al. 2001). For example, in assessing the impacts of climate change on Indian agriculture, O’Brien et al. (2004a) found that economically marginal regions often faced greater sensitivity and exposure to climate change, and at the same time had much lower adaptive capacity than better-off regions. Adaptive capacity was calculated as a composite index of social, environmental, technological, and economic indicators, many of which tended to be systematically lower in regions that were relatively more exposed to climate change. By contrast, relatively better off regions tended to be less likely to experience the negative effects of climate change as the result of both lower sensitivity and exposure, and higher

adaptive capacity. Other studies of climate vulnerability have reached similar conclusions, demonstrating the differential vulnerability across regions or social groups typically reflects underlying socioeconomic, political, and environmental inequities (Vásquez-León et al. 2003; Adger and Kelly 1999). What these studies suggest is that climate change will further increase inequities, rather than diminish them.

Adaptation to climate change presents a series of dilemmas related to both distributive and procedural justice (Paavola and Adger 2002). It is clear that some countries, regions, and social groups are much better able to adapt to the impacts of climate change. Some unresolved distributive issues relate to the amount and allocation of funding for adaptation in developing countries, as well as to the distribution of the benefits and the negative consequences of any adaptive response (Paavola and Adger 2002). From the perspective of procedural justice, issues of interests, influence, and participation in the adaptation process remain unsettled (Paavola and Adger 2002). Decisions about what adaptation strategies to pursue are likely to exclude many groups who might be affected by these decisions.

In considering inequities associated with adaptation to climate change, it especially important to emphasize that inequities are not limited to the international scale; they also appear at other scales of decision-making and planning. Lack of participation in local or regional-level decisions about how to respond to climate change may also be interpreted as a procedural inequity. Referring back to the example of Indian agriculture, village-level case studies revealed that some groups—particularly larger farmers—had more influence over strategies for responding to climate change than others, including the ability to access irrigation for continued production of export crops (O’Brien et al. 2004a). However, increased water withdrawals in semi-arid areas—particularly those areas likely to become drier as the result of climate change—were found to have long-term sustainability implications for all farmers, raising still others questions about equity in the distribution of the impacts of efforts to adapt to climate change.

Further, it must be underscored that the local and regional inequities related to climate change impacts and adaptation are not exclusive to developing countries. Although developed countries are often assumed to have low vulnerability and a high adaptive capacity based on GDP, technological development, education, institutions, and other factors, there are often regions, communities, or social groups that are considerably more vulnerable and have a lower capacity to adapt to changing climate conditions (O’Brien et al. 2004). In relation to climate change vulnerability and adaptation in Norway, O’Brien et al (submitted) found that some municipalities have relatively lower capacities to adapt to changes in the agricultural and tourism sectors resulting from climate change. These municipalities were generally characterized as having less-diversified economies that were already strained by a limited tax base and demographic shifts toward a more elderly population. Although the Norwegian government has for many decades promoted regional equality through rural policies and government transfers schemes, inequalities remain and are likely to be exacerbated through the unequal impacts of climate change. As discussed below, this recognition of local and regional inequities associated with climate change in both developing and advanced countries suggests that equity

considerations in the context of climate change and human security need to move beyond rigid North-South distinctions.

#### **4. Moving Beyond the North-South Divide**

Climate change is increasingly framed as an equity issue between the developed countries of the North and the developing countries of the South (Müller 2002; Tonn 2000; Ikeme 2003). The North typically views equity issues in terms of fair allocation of emission reduction targets, while the South sees the key equity questions as pertaining to responsibility for climate change and experience of the negative impacts from climate change (Müller 2002). These differing views on climate change equity are related to different perceptions about how climate change may affect human security. In the North, climate change is not seen as a critical threat to human security, but instead is characterized as an environmental pollution problem that can be addressed through lifestyle changes and pollution control policies. In the South, by contrast, climate change is considered a life-threatening human welfare problem which circumscribes the potential for development (Ikeme 2003).

However, the emphasis on inequities across nations, and particularly between advanced and developing countries, disguises many other critical equity issues related to climate change, with broader relevance to questions of human security. Procedural and distributive inequities that influence human security can be found within all countries and across all regions. As discussed earlier, there are many regions or groups who contribute little to greenhouse gas emissions, who have no voice in climate change negotiations and have no influence on key policies, who are disproportionately vulnerable to climate change, and who are unable to respond or adapt. For example, gender-based analyses show differential vulnerability for women, as well as differential ability to respond (Seager and Hartmann, 2004). If climate change is to be truly framed as an equity issue, then inequities within countries and across different social and gender groups also need to be acknowledged: “In fact, if we differentiate between rich and poor *people*, rather than rich and poor *countries*, we find that the human insecurities world-wide may look more alike” (O’Neill 1997, p. 10). Furthermore, these inequities between rich and poor are becoming greater as the result of globalization, with disproportionately negative impacts on women (Leichenko and O’Brien 2005).

Although distinctions based on income or gender do not sufficiently capture all equity aspects of climate change, the point is that there are differences across the globe, not just between the North and the South. As noted by Rayner and Malone (2001), there is very little positive relationship between a country’s average income and its level of poverty, citing the United States as a case in point. By the same token, the problem of over-consumption is not exclusive to the industrialized world. There are growing middle-classes in the developing world and many of the members of these classes are increasingly adopting high-consumption, energy-intensive, suburban lifestyles similar to those that have become commonplace in industrialized countries (Leichenko and Solecki 2004b).

The North-South divide on both mitigation and adaptation has also served to oversimplify the equity aspects of climate change, presenting them as issues of development versus stagnation, and responsibility versus victimization. Yet a closer examination of the process and outcome inequities associated with climate change reveals a much more complex picture, where alliances across the North-South divide may better mobilize action on climate change. As argued by Rayner and Malone (2001, p. 199-200, brackets and emphasis added):

“[s]imultaneously addressing gross distributional inequities *within* both the North and the South seems to be both an equity requirement and a necessary political condition for the success of any global climate policy...climate change ... provides an arena for debating a wide variety of social, economic, and political issues that society finds difficult to address directly. These include the unequal distribution of wealth within and among nation as and the tension between the imperatives of independence and interdependence at all levels of social organization. Much of the debate about equity in climate change mitigation [as well as in impacts and adaptation] is an extension of the broader debate about international economic development and political empowerment.”

## **5. Climate Change, Equity and Human Security**

Links between global environmental change and human security have often been discussed in terms of conflict or cooperation. Within the environment and security literature, the relationship between global environmental change and human security generally focuses on issues of resource scarcity, access, and control, and correlations to conflict (Homer Dixon 1994; Gleditsch, 1998; Matthew 2002). Yet human security, broadly defined, represents more than freedom from conflict. It includes the means to secure basic rights, needs, and livelihoods, and to pursue opportunities for human fulfilment and development (Khagram et al. 2003). From another perspective, “human security is achieved when and where individuals and communities have the options necessary to end, mitigate, or adapt to threats to their human, environmental and social rights; have the capacity and freedom to exercise these options; and actively participate in attaining these options” (GECHS, 1999, p. 26). The inequities that are created or exacerbated through differential drivers, outcomes, and responses to climate change thus have considerable implications for human security.

Climate change, as it is currently being researched, debated, and addressed in international science and policy arenas, has been represented as an issue of global concern that can be resolved through improved environmental management if the broader implications for development are simultaneously addressed (Berkhout et al. 2003; Adger et al. 2001). Although global arguments are significant and should be reason enough for actions to address climate change, scenarios of future climate conditions often do not resonate with the day-to-day experiences of individuals, communities, and regions. Equity issues, on the other hand, generate both attention and action. Transforming climate change into an issue of equity may make global environmental change more relevant to many who now see it as a distant, “global” problem.

In considering the broader linkages between climate change, equity and human security, it is also critical to recognize that threats to human security come not only through the direct consequences of climate change (i.e., through changes in temperature or precipitation), but also through the indirect consequences linked to both contextual and outcome vulnerability. Research on local and regional vulnerabilities to climate change has demonstrated that inequities that exist within and across nations and may be attributed to unequal economic relationships, unequal access to entitlements, differential social capital, power relationships, and institutional factors (Leichenko and O'Brien 2005). Climate change may potentially create new inequities through its uneven outcomes. The potential for overlaps between both these new and emerging inequities and underlying and longer term inequities across nations, regions, and social groups, poses perhaps the most critical threat to human security and should be a priority area for further research and policy attention.

Recognition of climate change as an issue of equity that selectively undermines human security of some regions and groups is essential to addressing the underlying factors that drive processes, influence outcomes, and condition responses. An emerging global movement demands environmental justice, equity, and rights, thus it is very likely that global environmental change will be reframed as an equity issue. Nevertheless, the quest for and implementation of equitable solutions remains a key challenge for policymakers, negotiators, and civil society. Research can support a transformation towards an equity-based understanding of climate change by asking and investigating probing questions related to climate change, equity, and human security.

## References

Adger, Neil. 2004. Commentary: The Right to Keep Cold. *Environment and Planning A* 36: 1711-1715.

Adger, Neil and Mick Kelly. 1999. Social Vulnerability to Climate Change and the Architecture of Entitlements. *Mitigation and Adaptation Strategies for Global Change* 4: 253-266.

Adger, W. N., Benjaminsen, T.A., Brown, K. and Svarstad, H. 2001. "Advancing a Political Ecology of Global Environmental Discourses." *Development and Change* 32:681-715.

Agyeman J., Bullard R.D., and Evans B. (eds.) 2003. *Just Sustainabilities: Development in an Unequal World*. Cambridge, MA: MIT Press.

Athanasidou, Tom and Paul Baer. 2002. *Dead Heat: Global Justice and Global Warming*. New York: Seven Stories Press.

Baer, Paul, Harte, J. Haya, B. Herzog, J. Hultman, N.E., Kammen, D.M., Norgaard, R.B. and L. Raymond. 2000. Equity and Greenhouse Gas Responsibility. *Science* 289: 2287.  
Boulding, Kenneth E. 1978. *Stable Peace*. University of Texas Press: Austin.

Berkhout, Frans, Leach, Melissa, and Ian Scoones. 2003. "Shifting Perspectives in Environmental Social Science." Pages 1-31 in Frans Berkhout, Melissa Leach, and Ian Scoones (eds.), *Negotiating Environmental Change: New Perspectives from Social Science*. Cheltenham, U.K.: Edward Elgar.

Brown, Donald. 2003. The Importance of Expressly Examining Global Warming Policy Issues through an Ethical Prism. *Global Environmental Change* 13: 229-234.

Cutter, Susan. 1995a. The Forgotten Casualties: Women, Children, and Environmental Change. *Global Environmental Change* 5(3): 181-194.

Cutter, Susan. 1995b. Race, Class and Environmental Justice. *Progress in Human Geography* 19: 107-118.

Cutter, Susan and William Solecki. 1996. Setting Environmental Justice in Space and Place: Acute and Chronic Airborne Toxic Releases in the Southeastern United States. *Urban Geography* 17: 380-399.

Denton, Fatma. 2002. "Climate Change Vulnerability, Impacts, and Adaptation: why does gender matter?" *Gender and Development* 10(2): 11-20.

Dore, Mohammed H. I. and Timothy D. Mount. 1999. *Global Environmental Economics: Equity and the Limits to Markets*. Cambridge, MA: Blackwell.

GECHS. 1999. *Global Environmental Change and Human Security (GECHS) Science Plan*. IHDP Report No. 11, Bonn, Germany: IHDP.

Gleditsch, Nils Petter. 1998. "Armed Conflict and the Environment: A Critique of the Literature." *Journal of Peace Research* 35: 381-400.

Gore, Albert. 1992. *Earth in the Balance: Forging a New Common Purpose*. Earthscan Publications: London.

Gupta, Joyeeta. 2000. "On Behalf of my Delegation, ..." A Survival Guide for Developing Country Climate Negotiators. Center for Sustainable Development of the Americas: Washington, D.C. Available online at:  
[http://www.cckn.net/pdf/my\\_delegation\\_en.pdf](http://www.cckn.net/pdf/my_delegation_en.pdf)

Homer-Dixon, Thomas. 1994. "Environmental Scarcities and Violent Conflict: Evidence from Cases." *International Security* 19: 5-40.

- Hurrell, Andrew and Ngaire Woods. 1995. Globalisation and Inequality. *Millenium: Journal of International Studies* 24(3):447-470.
- Ikeme, Jekwu. 2003. Equity, Environmental Justice and Sustainability: Incomplete Approaches in Climate Change Politics. *Global Environmental Change* 13: 195-206.
- Kasperson, Roger E., Kasperson, Jeanne X. and Kirsin Dow. 2001. Vulnerability, Equity, and Global Environmental Change. Pages 247-272 in Jeanne Kasperson and Roger Kasperson, editors. *Global Environmental Risk*. London: Earthscan Publications.
- Kempf, Claudia and Richard Tol. 2002. Equity, International Trade, and Climate Policy. *International Environmental Agreements: Politics, Law and Economics* 2: 23-48.
- Khagram, Sanjeev, Clark, William C. and Dana Firas Raad. 2003. "From the Environment and Human Security to Sustainable Security and Development" *Journal of Human Development* 4(2): 289 – 313.
- Kütting, G. 2004. Environmental justice. *Global Environmental Politics* 4: 115-121.
- Lake, Robert. 1996. Volunteers, NIMBYs, and Environmental Justice: Dilemmas of Democratic Practice. *Antipode* 28: 160-174.
- Leichenko, Robin and Karen O'Brien. 2005. *Double Exposure: Global Environmental Change in an Era of Globalization*. New York: Oxford University Press (forthcoming).
- Leichenko, Robin and William Solecki. 2004a. Consumption Landscapes and Environmental Justice in Cities of the Developing World. Paper presented at Environmental Justice Abroad conference, Rutgers University, October 16, 2004.
- Leichenko Robin and William Solecki. 2004b. Exporting the American Dream: The Globalization of Suburban Consumption Landscapes. *Regional Studies* (forthcoming).
- Matthew, Richard A. 2002. "In Defense of Environment and Security Research." ECSP Report 8: 109-124.
- Müller, Benito. 2002. *Equity in Climate Change: The Great Divide*. Oxford Institute for Energy Studies, with support of Shell Foundation: Oxford.
- O'Brien, Karen and Robin Leichenko. 2003. Winners and Losers in the Context of Global Change. *Annals of the Association of American Geographers* 93: 99–113.
- O'Brien, Karen and Robin Leichenko. 2000. Double exposure: Assessing the Impacts of Climate Change within the Context of Economic Globalization. *Global Environmental Change* 10: 221–232.
- O'Brien, K, R. Leichenko, U. Kelkar, H. Venema, G. Aandahl, H. Tompkins, A. Javed,

- S. Bhadwal, S. Barg, L. Nygaard, and J. West. 2004a. Mapping Vulnerability to Multiple Stressors: Climate Change and Economic Globalization in India. *Global Environmental Change* 14.4: 303-313.
- O'Brien, K.L., Sygna, L. and J.E. Haugen. 2004b. Resilient or Vulnerable? A Multi-Scale Assessment of Climate Impacts and Vulnerability in Norway. *Climatic Change* 64: 193-225.
- O'Brien, K.L., Eriksen, S., Sygna, L. and L.O. Næss. Submitted. Questioning European Complacency: Climate Change Impacts, Vulnerability and Adaptation in Norway. Submitted to *Ambio*.
- O'Neill, Helen. 1997. Globalisation, Competitiveness and Human Security: Challenges for Development Policy and Institutional Change. *The European Journal of Development Research*, 9(1): 7-37.
- Paavola, Jouni, and W. Neil Adger. 2002. Justice and Adaptation to Climate Change. Tyndall Centre for Climate Change Research, *Working Paper 23*.
- Pettit, Jethro. 2004. Climate Justice: A New Social Movement for Atmospheric Rights. *IDS Bulletin* 35 (3): 102-106.
- Rawls, John. 1971. *A Theory of Justice*. Oxford: Oxford University Press.
- Rayner, Steve and Elizabeth L. Malone. 2001. Climate Change, Poverty, and Intragenerational Equity: The National Level. *International Journal of Global Environmental Issues* 1(2): 175-202.
- Rees, William and Laura Weestra. 2003. When Consumption Does Violence: Can There be Sustainability and Environmental Justice in a Resource-Limited World? In *Just Sustainabilities: Development in an Unequal World* (Agyeman, Julian, Robert Bullard, and Bob Evans, eds.), Cambridge: MIT Press, 99-124.
- Ringuis, Lasse, Asbjorn Torvanger, and Arild Underdal. 2002. Burden Sharing and Fairness Principles in International Climate Policy. *International Environmental Agreements: Politics, Law and Economics* 2: 1-22.
- Rose, Adam and Snorre Kverndokk. 1998. "Equity in Environmental Policy: An Application to Global Warming." In *Handbook on Environmental and Resource Economics*, ed. J. van den Bergh, 352-379. London: Edward Elgar.
- Rose, A., Stevens, B. Edmonds, J. and M. Wise. 1998. "International Equity and Differentiation in Global Warming Policy." *Environmental and Resource Economics* 12: 25-51.

- Seager, Joni and Hartmann, Betsy. 2004. A Gender Assessment of DEWA and UNEP. Final Report to DEWA.
- Skutch, Margaret. 2002. Protocols, Treaties and Action: The 'Climate Change Process' Viewed Through Gender Spectacles. *Gender and Development* 10(2): 30-39.
- Slocum, Rachel. 2004a. Consumer Citizens and the Cities for Climate Protection Campaign. *Environment and Planning A* 36(5): 763-782.
- Slocum, Rachel. 2004b. Polar Bears and Energy-Efficient Light Bulbs: Strategies to Bring Climate Change Home. *Environment and Planning D: Society and Space* 22(3): 413-438.
- Smith, David. 1994. *Geography and Social Justice*. Cambridge, MA: Blackwell.
- Steffen, Will, et al. (eds.), *Global Change and the Earth System: A Planet Under Pressure*. Berlin: Springer Verlag.
- The Economist*. 2001. Does Inequality Matter? June 16<sup>th</sup>, p. 11.
- Tonn, Bruce. 2003. An Equity First, Risk-Based Framework for Managing Global Climate Change. *Global Environmental Change* 13: 295-306.
- Toth, Ferenc. 2000. "Intergenerational equity and discounting." *Integrated Assessment* 1(2): 127-136.
- Turner II, Billie Lee, et al. 2003. "A framework for vulnerability analysis in sustainability science." *Proceedings of the National Academy of Science* 100(14): 8074-8079.
- World Commission on Environment and Development. 1987. *Our Common Future*. New York : Oxford University Press.
- United Nations Environment Programme. 2002. *Global Environment Outlook 3*. London: Earthscan Publications.
- United Nations. 2005. *The Inequality Predicament: Report on the World Social Situation, 2005*, New York, NY, United Nations Department of Social and Economic Affairs.
- Vásquez-León, Marcela, West, Colin Thor, and Timothy J. Finan. 2003. "A Comparative Assessment of Climate Vulnerability: Agriculture and Ranching on Both Sides of the US-Mexico Border." *Global Environmental Change* 13: 159-173.
- World Resources Institute et al. 2000. *World Resources 2000-2001*. Washington, D.C. WRI.
- Worldwatch Institute 2005. *State of the World 2005: Global Security*. Forthcoming.