policy

Beyond Kyoto

Advancing the **international effort** against **climate change**

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Equity and climate

In principle and practice

John Ashton and Xueman Wang

I. Why Equity Matters[1]

In a recent experiment with pairs of five-year-olds, one in each pair was given ten chocolate coins and invited to share them with the other, who could choose either to accept or reject the allocation offered.[2] In the case of rejection neither child got to keep any of the coins. Most spurned any offer of fewer than four of the ten coins. A fair distribution of reward was seen as more important than the reward itself. Whether this strong sense of equity is a basic instinct, as the coin experiment suggests, or a social construct—whether it emerges from our genes or from culture—it looms large across a wide range of human affairs. The notion of equity has a universal appeal.

In most societies some idea of equity lies at the heart of politics: the art of "sharing coins" across a community. Political movements often start as protests by groups of people who feel unfairly treated. Successful politicians broker solutions that people with different interests can all regard as fair—or, at the very least, not demonstrably unfair to one group or another. The results have come to be reflected in our institutions. Many legal systems give judicial meaning to the notion of fairness. The quest for equity pervades international discourse. It inspires the United Nations Charter, with its assertion that all humans equally are entitled to live in freedom from want and fear. It animates the current debate about globalization.

Equity is a familiar theme in environmental negotiations. At the Rio Earth Summit in 1992, the international community agreed that "the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations." Polluting states were to be accountable for the transboundary consequences of their pollution (the "polluter pays" principle). The effort states should make in responding to common environmental challenges was to reflect the extent to which they had contributed to the problem and their capacity to address it (the principle of "common but differentiated responsibilities").[3]

Climate change poses a serious challenge to our ability to construct equitable global responses to shared problems. Emissions of greenhouse gases (GHGs) come disproportionately from industrialized countries. Some countries—again predominantly in the industrialized world—are better placed than others to pioneer the technologies, processes, and behavioral changes that will be necessary to mitigate their emissions. Moreover, the most harmful consequences of climate change are likely to befall the

poorest countries: in many cases, not only those least responsible for unleashing them, but also those least equipped to deal with them. Furthermore, in the climate negotiations, the same countries tend to be the least able to make their voices heard or to assess the implications of any proposed outcome in light of their own interests.[4]

So it is not surprising that the language of equity has permeated the international negotiations on climate change since they began in 1991. Different nations and groups of nations have offered different, and often conflicting, visions of what is fair and what is not. Not surprisingly, these visions tend to coincide in most cases with perceived material interest. The two major agreements so far achieved—the United Nations Framework Convention on Climate Change (UNFCCC), and the Kyoto Protocol—each convey a palpable sense of the extent to which those who negotiated them bent over backwards to find a package of outcomes that all could consider fair. There is something for everyone.

These agreements reflect a rough calculus of equity at the early stages of the international climate effort. Both put the onus for early action on industrialized countries, citing common but differentiated responsibilities. They make clear that measures to deal with climate change should not limit the ability of developing countries to develop and pay special attention to the needs of the poorest and most vulnerable countries. They include provisions for the transfer of technology and financial resources and help in dealing with the impacts of climate change. The Convention commits parties to "protect the climate...on the basis of equity." It makes the fulfillment of obligations by developing countries conditional on assistance from the developed countries. The Kyoto emissions constraints apply only to the latter.[5]

But the Convention and the Protocol are only first steps towards an international regime capable of neutralizing the impact of human activity on the climate. The withdrawal of the United States from Kyoto has made them yet more tentative. A successor agreement will need to deliver stronger commitments further into the future. That will demand more effort and inevitably throw into sharper relief the links between climate change and equity. A deeper and more universal understanding of the equity considerations inherent in the climate problem will be needed. So will more powerful tools to resolve the conflicts and tradeoffs between competing views of fair outcomes. In short, the success of the negotiation will hinge in large measure on the ability of parties to come to terms with the equity dilemmas they will face.

This paper offers a set of tools for thinking about these dilemmas. Section II identifies the dimensions of equity that arise in the context of climate change. Section III examines how these present themselves in practice, in different domains of choice. We argue, on the basis of this analysis, that parties are unlikely to agree on any unitary approach to equity, based on a single, objective yardstick, as a foundation for a long-term climate agreement. Any search for such an approach is bound to fail and risks diverting negotiating capital away from more productive terrain. Rather, a fair agreement will be one that is qualitatively robust across competing equity claims.

The equity calculations underlying any eventual agreement will thus rest on political judgment and compromise. It will be important in the negotiation to leave space for that judgment, and for the balancing of competing conceptions of equity. From this perspective, section IV suggests some minimum equity conditions that a post-Kyoto climate agreement must meet in order to stand a chance of being considered fair by most if not all parties. Finally, section V assesses the extent to which various approaches to emissions mitigation might help construct an agreement that meets these conditions.

II. Equity in Five Dimensions

Before introducing the specific notions of equity that bear most directly on the climate debate, it is important first to distinguish more broadly between equity and the related but distinct question of interest.

Equity—whether grounded in philosophy, morality, or human nature—is an ideal that shapes our view of what is right or just. It is predicated on the notion of common good and, at times, calls on some to sacrifice for the sake of others. Interest, on the other hand, represents what is best for the individual (or, in the international context, the individual nation) as determined by that individual. Equity may be one factor in assessing interest. But it is rarely the overriding one. The others usually boil down to some assessment of costs and benefits.

Equity and interest may coincide. When they do not, interest often exerts a stronger influence on the chosen course of action. Inequities persist because rectifying them would diminish the self-perceived interests of those in the stronger position to control the state of affairs. History, however, offers examples of equity prevailing over established interests—for instance, the extension of voting rights to women and minorities. What is required in these cases is the mustering of sufficient political will.

Both equity and interest are reflected, then, in a common currency—effort. How much effort must, or will, a party undertake to meet a given set of obligations? Effort ordinarily is assessed in relation to the benefits to be gained. It is partly a function of perceived economic cost, to the economy as a whole or to groups within it. It has a relational aspect as well: a given obligation can feel easier if others are doing it too (by the same logic as the chocolate coin experiment). But effort is ultimately a political quantity. It depends on the amount of political capital a government is willing to invest in the attempt to stabilize the climate in relation to other priorities, on the leadership qualities of individual politicians, and on the relative political weights of the domestic constituencies that stand to win or lose. In the end, no government will accept an agreement that conflicts directly with its interests as it sees them, to whatever extent those interests reflect considerations of equity. So it is here, in the political judgment about how much effort to invest, that equity and interests must be balanced or aligned.

It can be hard to disentangle equity and interests. Governments often cloak their interests in the guise of equity. Competing parties champion different notions of equity, not surprisingly those coinciding most closely with their interests. Nonetheless, it is possible and perhaps essential to isolate and understand the essence of equity, uncluttered by other self-interested considerations. Only then can we begin to identify the contours of a "fair" outcome. If equity is to be served, the challenge is to fashion an outcome that is both fair and reasonably satisfies the interests of most or all concerned. In this examination, we do not ignore interest but rather put it aside to focus more directly on equity in order, hopefully, to contribute to such an outcome.

How Do We Decide What is Fair?

Many different equity notions or claims have been put forward in the climate debate. Most can be encompassed within what are here described as five dimensions of equity. Not all are universally held principles, but each has sufficiently broad appeal to have attained legitimacy in the eyes of many. Together, they define a notional "equity space." Any proposition in the negotiations locates uniquely in this space according to its projection in each dimension. Of course, equity space does not exist in any objective or physical sense. As we have seen, it looks different according to the interests of each party. But it is a useful notion in that each dimension is distinct from the others, and each must be considered for a full account of the equity content of any proposition. It enables us, in a sense, to deconstruct equity in the context of climate change.

Responsibility

In many circumstances, equity boils down to an allocation of responsibility. When our interests are harmed, the question of who is to blame is usually among the first to arise.

In the realm of the environment, the polluter pays principle illustrates this. It requires the party responsible for the harm to bear the costs of repairing it.[6] As a broad political concept, this is easy to comprehend and few would challenge its intrinsic fairness. But as a precise legal instrument, it is harder to apply. Even in simple cases, there is often room for dispute about how negligent the polluter might actually have been or how much damage has actually been incurred. A polluter who is conscious of the damage being caused should arguably bear more responsibility than one who is not.

Moreover, the notion of responsibility is hard to apply when the chain of cause and effect linking the initial action to the harm is long and uncertain; when the extent or distribution of the damage is difficult to quantify; when compensation for damage does not by itself solve the problem; or when the benefit arising from the harmful behavior is spread beyond the party responsible for the harm, for example through trade in carbon-intensive goods. As we shall see, all these difficulties apply in the case of climate change.

Nevertheless, a fair agreement on climate would need somehow to reflect the relative degrees of responsibility for the problem arising in the first place.

Equal Entitlements

Another approach to equity is based on the idea of rights or entitlements to certain goods or benefits. Equity becomes a question of how these entitlements should be distributed. In many cases the proposition is that all humans should enjoy equal entitlements to a given public good.

This egalitarian argument is most familiar in the case of abstract public goods like liberty, security, access to impartial justice, and opportunity. Entitlements of this kind are well established in international law, not least in the United Nations Charter and the two international covenants covering civil, political, economic, social, and cultural rights.[7] In principle, if unfortunately not always in practice, every citizen of whatever station in life has an equal right to enjoy them.

The principle is harder to invoke when it comes to more material goods. Some political systems apply egalitarian principles to some environmental resources such as access to land, water, or fisheries, usually by seeking to establish some form of public ownership. But these approaches often fail to deliver equal access in practice, even when so intended. In any case, they are a matter of political choice rather than universal agreement. No state, for example, shares equally among its citizens the benefits accruing from the extraction of its minerals (perhaps because these relate less directly than, say, water, to basic human needs). Most goods are allocated through property rights according to ability or willingness to pay, not provided equally to all.

Nevertheless, it is sometimes argued that entitlements should be applied to the atmosphere. Climatic stability is a global commons attribute. No one can own the atmosphere. Surely, runs the argument, every human has an equal stake in it: an equal share of the total "carbon space" available for human activity. On that basis, equity in any new climate agreement would be judged by the extent to which it carries us towards such an equal entitlements world.

Capacity

Another basic notion of equity relates to the capacity to act. The idea that the most able should contribute the most to the provision of a public good is well established in most national polities and in the international system. It is one of the principles behind progressive taxation. It is particularly relevant to the family of global pollution problems to which climate change belongs, in which industrialization goes hand in hand with damaging behavior.

Industrialized countries have more access to the technologies necessary to address such problems, and to the capital necessary to develop them and bring them to market. They are better able to put in

place the necessary policies, including those linking domestic measures to international commitments, and to innovate in pursuit of national goals. An equitable approach to climate would thus demand more from those most equipped to respond.

Basic Needs

Another component of fairness is the idea that the strong and well endowed should help the weak and less well endowed in meeting their most basic needs. Most countries at least aspire to offer a safety net to the helpless.

Internationally, this is one impulse behind the effort to eradicate poverty. The Millennium Development Goals define a set of basic human requirements to be met through shared action and support from those rich enough to provide it. Many developing countries insist on the right to accord a higher priority to fighting poverty at home than to contributing to global efforts that might conflict with this. This is essentially an appeal to the primacy of basic needs. Thus a fair climate change agreement would if possible help, and certainly not undermine, the efforts of the poorest countries to meet the basic needs of their people.

Comparability of Effort

In assessing whether an outcome is equitable, parties will invariably compare the effort they are being asked to make with that required of other parties. A proposal may satisfy the requirements of responsibility, entitlements, capacity, and basic needs. But if some seem to be getting a better deal than others—if their commitments are, in some sense, disproportionately easy—the deal may still seem unfair.

The idea that those with similar circumstances should undertake a similar degree of effort clearly has links to the other dimensions already described, particularly to capacity. It also lies at the intersection between equity and interests, since effort in this context is synonymous with the political and economic cost to a party of taking on a given set of obligations. But the essence of this dimension lies in its *relational* quality: the effort demanded of a party not only has to seem fair as an absolute expression of its record and circumstances but also in light of the deals secured by others.

What About Future Generations?

So far we have focused on equity between people living now. But climate change will restrict the choices of generations to come. We might therefore ask how we can ensure that our approach to it is also fair to them.

This is not an additional dimension of equity in the sense of the five we have just described. Instead, it cuts across each of them. Future generations will have no responsibility for the problem that is handed down to them. They too are entitled to a fair share of carbon space. Their capacity to act in response to climate change is, by definition, unpredictable at least in the long term. From their perspective, their basic needs will be no less important than ours; nor would they be likely if asked to accept a disproportionate share of the burden of effort.

The problem is how to reflect interests of this kind—interests that we hold in trust—in a present-day negotiation. Future generations do not have a seat at the table or a capacity to articulate a position. Poor countries can argue on basic needs grounds that when the survival of those alive now is at stake, their descendants must be left to look after themselves. But it is precisely because of our tendency to borrow destructively and unaccountably from the future that making the transition to sustainable development has become such a momentous challenge.

Few would dispute that the next climate agreement should in some sense be fair to future generations. A crude way to assess this would be in terms of its overall impact on emissions. The faster we can bring climate change under control, the less we damage the interests of successor generations. Accordingly, the analysis that follows does not explicitly address these interests. Rather, it assumes that an agreement that satisfies present-day equity considerations, thereby facilitating the strongest possible climate action, will also represent the best available deal for future generations.

III. Equity in Practice[8]

The five equity dimensions together capture the predominant ways in which equity is invoked in the context of climate change. But outcomes in the real world reflect the practical choices of governments, politicians, and others who shape opinion. For a clearer view of how our equity dimensions may constrain outcomes in the next phase of climate diplomacy, we must look at their implications in the different areas of decision-making, or *domains of choice*, within which parties will negotiate. Each domain has its own potential winners and losers, and each contributes to the multiple political judgments that must be made about whether an outcome looks fair.

There are, in essence, four separate but connected domains to consider. The first concerns what action should be taken, if any, to constrain *emissions* of greenhouse gases. The second concerns the *consequences* of climate change, and the steps necessary to deal with them. The third concerns the help given to, or received from, others through *transfers* of resources. The fourth concerns the *process* of negotiation on climate change.

Equity and Emissions

What obligations should a state in a given set of circumstances be expected to undertake to constrain its GHG emissions?

The notion of responsibility offers one type of response. As we have seen, responsibility for human interference with the climate is distributed unevenly. So it might seem reasonable to assess how much different countries have contributed to the problem, and to apportion accordingly the responsibility for solving it. Profligate emitters would be expected to do most to bring their emissions under control. As the largest emitters (in per capita, if not always absolute, terms) are generally also the wealthiest, such an approach would make sense as well from the perspectives of capacity and basic needs.

But in practice, the assignment of responsibility is hardly straightforward. There is uncertainty over the detailed connections between emissions at one time and climatic variation at another. Nor is it obvious exactly which emissions should be included in the "climate account." One approach would be to distribute emissions according to the relative *historic responsibility* of different countries for the extent of the problem so far. Methodologies for doing this have been under discussion for several years, based on a proposal originally made by Brazil.[9]

But from what date should the accounting of responsibility begin? Should the clock start with industrialization, with scientific speculation about the link between human activity and climate change, or at some later date? Should the account include only direct GHG emissions, or should it also cover emissions and withdrawals as a result of changes in land use? Should it be based on total emissions over the chosen period, on the resulting changes in GHG concentrations in the atmosphere, or on the degree of climate change likely to have been caused or committed to as a result of the changed concentrations?

And why in any case should parties be held responsible for what they did before the international community understood that human activity affects the climate? Perhaps it would be fairer to allocate responsibility according to *current emissions*. Furthermore, should not those whose *future emissions* are likely to grow most rapidly assume some responsibility for the climate consequences of their chosen development path?

In assessing responsibility, it is also reasonable to ask who benefits from the emissions caused by a particular activity. The Kyoto Protocol penalizes emissions at the point of production. But we live in a world with a high and growing volume of international trade. Thus some countries, such as producers of metals or large volumes of manufactured goods, generate emissions to make products that are used elsewhere in the world. There are equity grounds for the proposition that those who receive the benefits from the emissions (or "embedded carbon") associated with the production of such goods should carry the cost. Emissions might then be assessed and penalized at the point of consumption. Otherwise a steel exporter would be carrying a carbon burden for those who use the steel.[10]

The entitlements approach circumvents these complexities by choosing a different starting point. Rather than responsibility, it assigns rights, in the form of equal entitlements to the atmosphere. If everyone has an equal right to account for emissions, the next stage of the climate regime should bring per capita emissions closer together. So countries with high per capita emissions should reduce them; but those with low ones should have headroom within which to increase them. This is the basis of the proposal known as "Contraction and Convergence."[11] Such an approach has intuitive appeal. Indeed it is hard to see how any successful response to climate change could follow a radically different path to the one it maps out. But as a practical framework for the next stage of the international negotiations, it faces serious obstacles, not least in addressing concerns about the scale of resource transfers and domestic dislocation it might require of high emitters (see box below).

Some proponents of equal entitlements argue that the Kyoto mechanism of tradable emissions permits, applied without an agreed long-term regime based on equal entitlements, gives the industrialized

Contraction and Convergence

The "Contraction and Convergence" proposal, developed by Aubrey Meyer, assigns every human being an equal entitlement to GHG emissions. All countries should thus move towards the same per capita emissions. Total emissions should *contract* over time, and per capita emissions should *converge* on a single figure. The actual convergence value, the path towards convergence, and the time when it is to be reached would all be negotiable. The proposal allows for the trading of emissions entitlements using mechanisms of the kind permitted under the Kyoto Protocol.

At one level, this is compelling. It offers a long-term architecture for an international emissions regime, potentially robust across several of the equity dimensions identified in this paper. It would not require developing countries to shift their immediate focus away from their basic needs: their emissions constraints would bite gradually as per capita emissions increased. And by emphasizing entitlements as well as commitments, it could help address the sense of inequity that arises from the unrequited "carbon debt" of past emissions by industrialized countries.

But on closer inspection, there is no fundamental reason why the right to emit should be equally shared when access to other public goods is not: at the heart of the proposal lurks a contestable ideological choice to that effect. Moreover, perhaps it is not GHG emissions that should be equally distributed, but the welfare costs to which emissions give rise. Should not those living in cold countries (with high heating needs) or large countries with dispersed populations (high transport needs) be allowed higher per capita emissions? The large resource transfers from currently high per capita countries to low ones implied by the scheme may be equitable; but it is probably unrealistic to expect such commitments at this stage.

Ultimately, almost any conceivable long-term solution to the climate problem will embody, at least in crude form, a high degree of contraction and convergence. Atmospheric concentrations of GHGs cannot stabilize unless total emissions contract; and emissions cannot contract unless per capita emissions converge. The practical question is not whether this is a reasonable scheme, but whether the quickest way to realize it is to base the next stage of the negotiations explicitly on it.

Nevertheless, the contraction and convergence proposal plays an important role in the climate process. It focuses attention on the ethical questions at the heart of the climate problem, which no long-term solution can afford to ignore. If supported by a critical mass of countries, it would become an important force in the negotiation. The ideas behind the proposal will remain relevant to any discussion of climate and equity for as long as the search continues for a global response to climate change.

world permanent and disproportionate ownership rights over the atmosphere and should therefore be rejected. From a pure entitlements perspective, this position cannot be dismissed out of hand. Certainly, emissions permits have many of the attributes of other forms of property (and not least of a currency). But the permanence of the right concerned is open to question. Furthermore, emissions trading can be justified on other equity grounds, particularly capacity and comparable effort. The abandonment of this key piece of the Kyoto architecture would take the climate process backwards, not forwards. This illustrates the danger of pressing too far along a single dimension of equity to the exclusion of others.

Whether or not equal entitlements can be a basis for moving the climate effort forward, the notion of *per capita emissions* remains central to any discussion of climate and equity. As a simple yet powerful metric for encapsulating and comparing parties' emissions and economic profiles, it lends perspective on other equity dimensions, not least responsibility, capacity, and basic needs. It is easy to communicate to publics and is likely to feature increasingly in the climate negotiations. It is perhaps most useful, however, when coupled with other indicators such as per capita income and emissions per GDP to provide a fuller picture of countries' relative circumstances.

Any allocation of mitigation burden—whether through rights or responsibility—is further complicated if comparability of effort is to be an objective. This concern is often expressed in terms of competitiveness. Any regime that puts some countries under tighter carbon constraints than others alters the terms of trade and conditions for investment between them. This can also be the case among countries with the same carbon constraints. Two countries might have identical emission, population, and income levels, but differences in other circumstances—such as natural endowment, energy mix, or energy efficiency—will translate into greater marginal abatement costs for one than for the other.

It is unlikely that the Kyoto commitments will dramatically distort existing patterns of trade and investment, especially as the U.S. withdrawal will keep the price of carbon relatively low. Nevertheless, both Canada and Japan have argued that, particularly with the United States out, their targets put them at a distinct competitive disadvantage. Canada has even proposed that it receive emissions credits for its exports of clean energy to the United States, its largest trading partner. Arguments about unfair competition from unconstrained economies are likely to intensify as the regime becomes more ambitious.

Taking all these arguments together, an equity perspective on emissions suggests that the more prosperous a country is, and the higher its total and per capita emissions, the stronger should be its obligations. That points in the near term to more vigorous action by industrialized than developing countries. It also suggests the need for differentiation of commitments and a mechanism for minimizing competitive stresses, perhaps linked to international frameworks for trade and investment. But it also follows that as the more advanced developing countries achieve a higher level of development, and as their emissions and income grow, they will over time have to assume an appropriate share of the responsibility for limiting and ultimately reducing global emissions.

Equity and the Consequences of Climate Change

For many countries, particularly the poorest, the most pressing requirement in any new agreement will be for help in dealing with the harmful consequences of climate change. Equity is no less important here than in the context of emissions.

Harmful climate-related impacts are projected to arise from rising sea level; changes in patterns of temperature, winds, cloudiness, precipitation, ocean chemistry, and perhaps ocean currents; more frequent and possibly more violent storms; and destabilization of natural biomes. The human consequences are expected to include displacement of people, disruption of agriculture and fisheries, more intense competition for water, enhanced threats from agricultural pests and human diseases, and possibly enhanced risks of conflict arising from the interplay between these and other stresses.[12]

Countries will need to invest in measures that will make them less vulnerable to future impacts. How will equity considerations affect their responses?

Once again, the responsibility perspective is important. Those who suffer harmful climate change impacts will wish to hold accountable in some way those whose emissions are largely responsible. But even more than in the case of emissions there is a practical difficulty in translating responsibility in principle into a quantitative allocation of obligations. It is extremely hard if not impossible either to establish the precise causal connections between one country's emissions and the climatic impacts of those emissions on another, or to establish the exact additional costs of making an economy resilient to those impacts.

Considerations of capacity and basic needs reinforce the responsibility case. Prosperous countries have more options for dealing with the impacts of climate change. Households with more disposable income are better placed to relocate away from coastal areas threatened with inundation, or to seek livelihoods less dependent on the climate. Governments with more resources to deploy are better able to make their economies less vulnerable to climatic damage.

Poorer countries are not only less responsible for the problem. They are also, by and large, less equipped to deal with its results, and more vulnerable to disruption of their ability to meet the basic needs of their people. They can be expected to press for assistance commensurate with the scale of the damage they are likely to suffer. They will seek this both through the climate negotiations and in other contexts. For example, if weather-related natural disasters continue to become more frequent, their victims can be expected to call not only for emergency humanitarian relief but also for more systematic compensation in the context of climate change.

This kind of thinking could introduce strong currents of resentment into the climate debate, possibly flowing back into the wider dynamic of international affairs. One mechanism for this might be attempts to bring "class action" lawsuits for compensation against governments or energy companies.[13]

Consequences may also arise from the impacts not of climate change itself, but of the measures taken in response to it. Climate policies can affect the interests of different countries to different degrees. Some oil exporting countries press stridently for compensation for the economic costs of any decline in demand for oil. The impact of the Kyoto targets on their economies will likely be small alongside market fluctuations. But the general argument will attract more attention as the impacts of climate policy grow. A poor country whose economy depends heavily on the price of a commodity, especially coal, for which demand might decline as a result of a stronger climate agreement could legitimately appeal for help on grounds of responsibility and perhaps basic needs.

So in the domain of consequences, as with emissions, the considerations we have identified offer general guidance only. Equity arguments suggest that a new agreement will need to embody enhanced support for those countries facing harmful impacts of climate change. But they do not offer a detailed prescription for the scale of that support, for how the burden of providing it should be equitably distributed, nor for how it should be shared among recipients.

Equity and Resource Transfers[14]

The existing instruments set up various mechanisms for the provision by industrialized countries of funds, technology, and knowledge to developing countries. The Bonn and Marrakech Accords that clarify the operation of the Kyoto Protocol establish designated funds to help vulnerable countries adapt to climate change and to meet the special needs of the least developed countries. There are three separate funds: a Special Climate Change Fund, a Least Developed Countries Fund, and an Adaptation Fund. Developed countries have pledged new support in part through these funds amounting to 450 million Euro annually by 2005.[15] There are other commitments, under the Protocol and the Convention, to transfer technology and to help countries develop the capacity to engage on climate change.

Stronger assistance to developing countries for both mitigation and adaptation is an important component of equity, in particular the dimensions of responsibility and capacity. But as a practical matter, transfers of public funds are unlikely ever to meet the full needs of developing countries. Kyoto establishes a model, through the Clean Development Mechanism (CDM), for channeling private investment towards climate goals. It will be important in the next phase to explore further the potential scope of private sector finance in strengthening the capacity both to mitigate emissions and to deal with the consequences of climate change.

It can be hard to separate transfers driven by the climate regime from those that would take place anyway. Likewise, if funding for an activity with a climate benefit is provided through bilateral development assistance rather than a channel established under the climate regime, should that be reflected in the equity calculation? Furthermore, where do climate benefits end and others begin? Arguably, well-governed countries will be better able to implement successful policies to adapt to climate change. Does that mean that assistance outside the climate regime for general good governance should appear in the "equity account"?

Whatever the problems of definition, resource transfers will play a big part in the post-Kyoto negotiation. They are a tangible expression of the extent to which the notions of responsibility, capacity, and basic needs inform any outcome. They bring into the political equation their own groups of policy-makers, commentators and vested interests. As we have seen in the previous section, much of the attention will focus on assistance in dealing with climate change impacts. It will extend as well to other forms of support for developing countries, including the transfer of climate-friendly technology, and help in building domestic capacity to put climate policies in place. Yet, as in the two previous domains of choice, our equity dimensions serve better to justify these broad needs than to validate particular means, or apportion the costs, of meeting them.

Equity and Process

Equity relates not only to the substance of an agreement but also the process by which it is reached. There is no surer way to push an agreement out of reach than for a group of parties to conclude that the negotiating process is biased against them. Trade negotiations broke down in Seattle partly because developing countries saw the real deals being done behind closed doors among small groups of countries (the so-called "green room" process). In the climate negotiations, the disastrous meeting in The Hague in 2000 of the Sixth Conference of Parties (COP6) collapsed partly because developing countries would not accept as a fait accompli any last-minute agreement between the European Union and the United States.[16]

The Kyoto Protocol itself illustrates the importance of a fair process. There were no agreed criteria for assigning obligations. Some commitments were imposed by muscular chairmanship or gaveled through without reaction from exhausted negotiators. Developing countries were on that occasion pressed into accepting a deal made in their absence among their industrialized partners, fuelling their suspicions ever since about faits accomplis. The Kyoto Protocol might not have been agreed without such methods; but it has been fragile in part because of them. As the process becomes more demanding on more countries, it will become ever more important for all to feel that their voice in it will be heard.

This imperative derives, in a sense, from the equity dimension of entitlements: all who believe they have interests at stake in any aspect of the negotiation are entitled to equal access to the process. And there should be room for any party to press its concerns. The negotiation—and, hence, its outcome—stand a better chance of being accepted as fair if the process is transparent and open to all parties.

In a negotiation with 168 parties clustered into disparate groups, each incorporating a range of conflicting interests, it is a challenge to establish these conditions. There will always be tension between the need to create the time pressure without which parties cannot be brought to compromise and the desire of each party to be allowed enough time to assess its interests. Any deal reached behind closed doors between some parties without consulting others will always be vulnerable, even if it only touches directly on the interests of the parties in the room. Yet in any large negotiation the core political deals are always struck informally between those with most at stake. Those willing to take on commitments resent vetoes from those not being asked to do so. It can be destabilizing to demand, as some often do, that no deal is acceptable without parallel progress on all issues, so that emissions cuts offered by industrialized countries become contingent upon specific kinds of resource transfer, however desirable. So transparency and inclusion can only work if all parties show sensitivity to each other's process concerns and nurture a sense of responsibility to the process as a whole.

Another equity dimension at play here is capacity. The climate negotiations are among the most complex ever attempted, and some parties have far greater capacity to participate effectively in them. During any session, several dozen highly technical negotiations proceed simultaneously, covering issues as diverse as the rules of procedure and feedbacks between climate change and ozone depletion. Parties with enough skilled negotiators to engage effectively on each issue, and make the linkages between them, are at an advantage. The larger industrialized countries typically bring teams of several dozen—in some cases over a hundred—officials to a major negotiating session. Many of the poorest countries manage only to send a single representative.

This is not just a question of the size or skills of the team a country can deploy in a negotiating session. To participate with confidence in the process as a whole, a government needs to be able to maintain an up-to-date assessment of its national interest in each of the many areas under discussion. It must understand the implications of the positions and underlying policies of others. It must maintain domestic systems to set climate goals, integrate them with other areas of policy, monitor performance against them, and anticipate future developments. This requires a large investment in people and institutions. Many countries simply lack this capacity. The process has coped with this so far. The most pressing commitments have up to now largely been required from countries able to participate fully. But it may not be possible to broaden participation in the next phase without a major effort to broaden the capacity to participate.

Various means are available. Training can be provided to negotiators and policymakers. Advice and financial support can be given to strengthen domestic institutions. Investment could be made in shared regional capacity among groups of countries with similar circumstances. Following Seattle, for example, developed countries wisely stepped up this kind of support for developing countries to take part effectively in trade negotiations.

Most debate about the future of the climate regime takes place among scholars, officials, activists, and others from the North. It might be worthwhile to provide opportunities for representatives of developing countries to play a fuller part in such dialogue, off line from the formal negotiations. Participation in such initiatives would help build confidence and shared perspectives on key issues before they arise in the more highly charged setting of the negotiations.

Leaving Room for Politics

The multiple dimensions of equity–some competing, others mutually reinforcing–inform and constrain each of the major domains of choice confronting governments. As we have seen, none of these dimensions can by itself offer a realistic path towards a detailed, quantitative allocation of effort country by country. What is striking about the attempts that have been made to construct such a path is that they lead in different directions. Still less is there a uniquely reasonable way to combine the different approaches into a single, all-purpose yardstick. Different choices about how much weight to assign to each lead to different outcomes. There is no single objective way to reconcile them or to calculate tradeoffs between them—no algorithm with which to construct an inherently equitable agreement.

Yet unless an agreement is seen as equitable it will neither win adherents nor mobilize real action—it will not be effective. How then do we arrive at an equitable outcome? The construction of an equitable agreement—indeed the very perception of what is equitable—is bound at each stage to be a matter of political judgment, vision, and leadership. We need to allow space for the politics to arrive at a rough balancing of competing equity demands. This is not, in the final analysis, a quantitative exercise. Rather we must look for outcomes that are robust in a qualitative sense across the many dimensions of equity at play.

IV. Equity and the Next Climate Agreement

Our aim in the next phase of climate negotiations must be an international strategy that will take humanity substantially further towards a restored climate. This will require far stronger mitigation of emissions than provided for under Kyoto: both deeper cuts by industrialized countries and, in time, an extension of commitments beyond

those countries. With respect to emissions, in other words, we need both to *deepen* and *broaden* the effort. We must at the same time address the needs of those who, despite such efforts, will bear the consequences of a changing climate.

One way to begin mapping a way forward is to suggest a set of conditions that a new global climate agreement must meet, or elements it must contain, for it to be robust across the key equity dimensions. Those conditions would, in effect, form a gateway through which the negotiations would need to steer. Through it lies the space in which the final political deals could be cut.

The conditions must reflect both the broad equity considerations that run through the climate debate and the particularities of this moment in climate diplomacy. Taking the present, tenuous state of affairs as a starting point, they must define the rough contours of a fair approach capable of mobilizing an effective, long-term global response to climate change. The conditions outlined below are, in essence, a set of minimum attributes by which an equitable agreement can be recognized.

First Equity Condition: Action by the United States

In the long term, no effort against climate change can succeed unless the United States is engaged. Only limited progress, then, can be envisioned until the United States initiates meaningful efforts to reduce its emissions. U.S. action will contribute much more to the global effort if undertaken as a party to a multilateral agreement rather than unilaterally. Either way, it is important that in the eyes of other parties these efforts are commensurate with the United States' responsibility for past and current emissions and its capacity to act. The United States is the world's most prolific emitter and, among the major economies, the largest per capita emitter. It is also one of the major potential sources of climate-friendly innovation and capital, and of demand for emissions credits.

Progress towards the overall climate stabilization goal would be much harder if the economy that accounts for some 25 percent of global emissions takes on no climate commitment, even if others are still willing to play their part. But continued U.S. absence would also put a brake on what other industrialized countries would be able to do. They would be under pressure from sectoral interests not to cede further competitive advantage to the United States. Developing countries might see no point in taking on new obligations, for which in any case the equity arguments would be very weak without action by the United States.

The climate process in its current form would in these circumstances stall or disintegrate. At best it might fragment into competing geographical blocs. The European Union might press ahead in the conviction that the longer-term innovation benefits of climate action outweigh the shorter-term costs. Germany, Sweden, and the UK have recently set long-term goals designed to deliver much deeper cuts over the next few decades. But even if others were to join them, it would be impossible to build up the momentum that would be available from a concerted global effort.

That is not to say that other parties should simply agree to whatever it takes to get the United State back into the international regime. A period of fragmentation, perhaps involving regional agreements, could still be better than a global agreement built on inadequate foundations.

Second Equity Condition: Continued Leadership by Industrialized Countries

Apart from U.S. action, industrialized countries must as a group continue to lead the effort, as the Framework Convention obliges them to do. Collectively, industrialized countries account for some 85 percent of historic and 65 percent of current emissions.[17] They have higher per capita emissions, greater capacity to act, and are less vulnerable to the consequences of climate change. So they will need to accept deeper cuts in emissions.

Third Equity Condition: Some Developing Countries Constrain Emissions

This is the most sensitive and complex equity condition. Developing countries have consistently argued that it would be unfair to impose carbon constraints at this stage on their economies. They believe that this would unreasonably restrict their ability to address their more urgent priorities, particularly to fight poverty. They fear that the obligation to limit emissions would make it harder for them to deliver sustainable livelihoods, housing, education, health, and other essential public goods. They argue that they should not be hampered in this way because these are moral imperatives, and because industrialized countries were able to reach their current levels of development without carbon constraints.

These are legitimate concerns. No climate regime should undermine the ability of parties to meet the basic needs of their people. However, as future emissions from some of the more populous and most rapidly developing countries loom larger over time, there will increasingly be a case for such countries to accept some responsibility for the contribution they are making to climate change. Further, there is growing recognition that strategies to reduce emissions growth can at the same time address the overriding economic priorities of developing (as well as industrialized) countries.[18] Improved energy efficiency, for instance, contributes both to climate mitigation and to economic growth. Approached from this perspective, deeper engagement in the climate regime can be seen more as an opportunity than a burden for developing countries.[19]

One complexity is the enormous variation among the circumstances of the 145 nations with developing country status in the climate process. There is no case for the 48 countries in the "Least Developed Countries" group to take on binding commitments, though that should not exclude them from sustainable development benefits arising from other forms of participation in the next stage. For other developing countries, any path towards commitments may need to include criteria to decide which countries should join the commitments regime at what point.

As we have seen, developing countries are particularly vulnerable to the impacts of climate change. They have an interest in an effective regime that moves as rapidly as possible towards the lowest possible level of stabilization. Otherwise, climate change itself will constrain their economic choices and undermine their efforts to fight poverty. To the extent that stabilization cannot be achieved without them, they have some interest in participating sooner rather than later.

Fourth Equity Condition: More Help in Dealing with Climate Impacts

At the same time, developing countries are unlikely to offer what will seem to them a large concession by accepting the possibility of commitments without a deeper shift in the way industrialized countries respond to their equity arguments. This will, in part, require a willingness to do substantially more to help vulnerable countries deal with climate change impacts. This is not only a matter of financial support but also the investment of imagination into more effective approaches to building the capacity to deal with climate impacts, and within that to the rapid diffusion of technologies and governance systems that can support this. Avenues to explore might include linking assistance to some measure of responsibility, assistance for certain kinds of weather-related disaster, and the resettlement of people displaced by climatic factors. One proposal calls for reforming disaster relief funding by creating a Climate Impact Relief Fund under the UNFCCC.[20] Developed countries are likely to be reluctant to move in any of these directions. But such steps may be necessary to persuade developing countries to take on emission commitments.

Fifth Equity Condition: Other Kinds of Help

The North must also invest in the capacity of developing countries to participate in the climate process. This goes beyond the provision of training and other human resource assistance to enable countries to engage with confidence in the negotiations themselves. It will also include help in linking the international process with domestic policy; and the application of technologies, processes, and development alternatives that can deliver benefits both for local sustainable development and for the climate. A key area will be the development of affordable clean energy and transport options. Some of this support might be geared particularly towards the capacity to take on, and derive maximum benefit from, emissions targets.

These five conditions form the outline of a mutually reinforcing climate package. The more confidence developing countries have that the North will shoulder its responsibilities, the easier it will be for them to take on new obligations of their own. And the more willing they are to do so, thereby broadening the regime, the further the North should be able to go in deepening it.

V. Mitigation Options

Having suggested conditions that a future climate agreement must meet to be viewed as equitable, we can now assess how helpful different approaches might be in delivering them. The conditions fall into two categories. The first three relate to mitigation of emissions through a deeper and broader regime. The other two concern help from the North to the South. Both categories are crucial, but mitigation of emissions is the more complex. In addition to political will, it will require great ingenuity to design a suitable regime. This section will assess from an equity perspective some of the options available, most of which are set out in more detail in other papers in this volume.[21]

First, however, it is worth highlighting two features of the Kyoto model that could, if extended, make an indirect yet critical contribution to resolving the equity dilemma.

The first is the flexibility that Kyoto allows to parties in meeting their commitments: through action on different GHGs, through the sequestration of carbon in soil and vegetation, through projects to mitigate emissions elsewhere, and through trading in emissions permits. The aim of this flexibility is to enable parties to meet their commitments at the lowest possible cost, thereby delivering more mitigation for a given effort. Yet there are implications for equity as well. The lower the cost or burden, the less pitched will be the battle over allocating it. Looking forward, economic costs will loom only larger. Certain areas of flexibility, for instance over multiple types of commitments, might help to reduce political burdens. The basic point is that in pursuit of an equitable outcome, regime flexibility is an ally.

The second pertinent feature of the Kyoto architecture is the way it enshrines different treatment for different countries and groups of countries. Industrialized countries have individually negotiated emissions targets. Among them the economies in transition can choose the baseline year against which their targets are defined. Developing countries have no emissions commitments, and access to certain kinds of assistance, with further help available for the poorest. This differentiation is in some respects arbitrary. But it also opens up many possibilities to take account of equity considerations. In all likelihood, further differentiation will be critical to achieving an equitable outcome in the next phase.

Fixed Kyoto-like Targets

Fixed targets expressed in total national net emissions—or possibly limited to specific sectors—over a given period could embody all the necessary equity considerations. Emissions could be allocated in light of a country's responsibility for current and past emissions as well as its per capita emissions, its capacity to act and the implications of its commitment for basic needs. Standard indicators could be developed to inform the assessment of each factor.

Of course, their relative weights in fixing any country's commitment cannot be determined on the basis of equity alone. To some extent this would need to emerge from the politics of the process, though even here equity considerations can narrow the range of choices.

With targets of this kind, however, parties cannot accurately forecast the cost of meeting their commitment. Certainty in environmental impact dictates uncertainty in cost (since the market will set the price of each ton of carbon abated). This is unattractive for economies that are fast-growing or otherwise subject to wide fluctuations: a growth spurt would push up emissions and thus increase the effort required to meet a given commitment. Uncertainty about the effort implied may limit the maximum target that any country can regard as fair. Targets with a built-in buffer against unforeseen economic developments might persuade some governments to commit to a more ambitious obligation than they could accept in the form of a fixed target.[22]

Indexed Targets

One approach would be to express commitments not in terms of absolute emissions, but as an "indexed" or "relative" target set as a ratio between emissions and some indicator of economic performance. Options include emissions per unit of gross domestic product (GDP) (the "carbon intensity" of the economy), energy consumption per unit GDP, or analogous sector-specific indices. An alternative form of relative target could be expressed in terms of per capita emissions. This would build the entitlements approach into the regime. Many developing countries would see this as a step forward for equity.

These approaches focus more directly on decoupling economic growth from emissions and dampen the effect of economic fluctuations. By reducing the corresponding uncertainty, they would expand the realm of what some governments might see as fair. They could be made to fit the existing architecture, to allow access for example to emissions trading (though trades would need to take place at the end of the accounting period, since the total emissions allowed under the target could only be calculated when GDP at that point was known).

A Safety Valve

Another means of providing certainty about cost—again at the expense of clarity about expected emissions—would be to set a maximum price for emissions permits. If the marginal cost of abatement rose above that price, parties would not have to pay more for additional emissions permits. The net effect would be less mitigation than would have been required without the price cap. Again this would give parties confidence that they would not be risking a degree of effort that they judged unfair. They might therefore be willing to take on more demanding commitments than they would in a regime without such a mechanism. This approach could appeal particularly to countries, like the United States, under pressure on equity grounds to take on tough obligations, and concerned about cost, competitiveness, and comparability

of effort. It is not, of course, a category of target in its own right, but rather a "safety valve" that can be applied to many types of target. All targets that can be expressed in terms of tons of carbon, and give rise to a market price for carbon offsets, could in principle be modified in this way.

"No-Lose" Targets and Graduation Thresholds

This option has been proposed primarily as a potentially attractive means of entry for developing countries into a regime of emissions commitments. They could enter in stages, first taking on softer, non-binding obligations. It might be possible to devise these to allow at least partial access to emissions trading and project investment beyond the CDM. New opportunities might be devised, building on the experience of the CDM, to attract investments that would provide benefits both for the global climate and for local sustainable development needs. These might include innovative forms of finance, mixing public and private capital. The aim in each case would be to offer the prospect of economic as well as climate benefit at low or zero risk.

From an equity perspective, such approaches offer a constructive response to the arguments put forward by developing countries. They could open the way for evolutionary progress towards more demanding commitments, linked to economic and social progress. But there would need to be criteria for determining who should enter the commitments regime in the first place and when they should do so: conditions, in effect, for graduating from the group of developing (or "non-Annex I") countries in its current form. This is among the most sensitive of all equity questions. The attractions of graduation would need to overcome the strong resistance, going well beyond the climate process, to any erosion of the principle that developing countries should wherever possible act as a single group.

Developing countries have argued that emissions commitments should in fairness only apply to countries beyond a certain level of development. There are anomalies under Kyoto: a few countries without commitments have higher per capita GDP than some with commitments. But overall it is implicit in the Kyoto regime that the threshold lies somewhere between the economic and social circumstances of developed and developing countries. In a more flexible and varied system of commitments, there would be more room on equity grounds for an initial threshold that would allow some developing countries at least to take on "no-lose" commitments at an early stage.

One way to approach this would be to design a threshold based on objective indicators. No single metric would be acceptable to all countries. The correct mix would be difficult to negotiate. It could be based at least partly on a per capita description of a country's circumstances, so as to relate development to the needs of individuals. If a graduation criterion of this kind could be agreed, it would streamline the process by avoiding the need to negotiate all new commitments on a case-by-case basis. It would also contribute to confidence that those who achieve the capacity to act in line with their growing responsibility will do so.

An alternative approach would simply be to create a mechanism whereby countries that felt comfortable about taking on commitments could have them recognized within the framework of the new regime. They would in effect decide to graduate, on the basis of their own assessment of where a reasonable threshold lies. Such a mechanism was under negotiation at Kyoto, but fell out of the final package.[23]

Variable Geometry

Many of the elements described above are compatible with each other and with the essential features of Kyoto, such as project mechanisms, carbon trading, and standardized procedures for maintaining and reporting emissions inventories. Most of them are not alternatives to each other, but potential components of a more sophisticated climate regime. Countries could choose from a menu of possible options those about which they felt most comfortable. This would extend the flexibility and differentiation reflected in Kyoto, which as we have seen would have equity attractions. There would be a price in terms of greater complexity and therefore higher transaction costs. But we have learned to live with complex regimes in other areas, and this may be an acceptable price for a regime that delivers more mitigation on a fairer basis.

VI. Conclusions

There is no "single truth" about equity—no unique mathematical solution to the equity equation. Room must be left for politics and interests. After all, the world is not fair. Natural resources are distributed as if by a roll of the dice, with regard neither to equity nor virtue. So are earthquakes. To demand more rigorous levels of equity in dealing with climate change than we do in other contexts would penalize everyone, by reducing the political space in which to find solutions. The least fair outcome for everyone would be failure to get to grips with climate change.

That said, we can now identify some of the features a new agreement will need if it is to be seen as equitable, and thus be negotiable. A successful agreement will form a complex tapestry of obligations in different areas. Taken together these will need to pass muster in each of our equity dimensions. This will require far more political will than has so far been available. A failure of political will, however, must be set against the consequences of failure to act in the face of a momentous global challenge.

The above picture is based on the assumption that, by and large, this is a self-standing negotiation—that it does not depend critically on what happens elsewhere on the international stage. Can we take this for granted? Or could friction in other areas, or a general loss of confidence in multilateralism, undermine the prospect of agreement on climate? These questions cannot yet be answered. But climate change raises profound questions of prosperity and security as well as equity. After all, to those facing it, the rising sea is a weapon of mass destruction. The need for an agreed global response to the climate threat is a very powerful reason for all nations to invest in an equitable and effective multilateral system.

Endnotes

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1. This paper treats the concepts of equity and fairness as interchangeable, reflecting their usage in much public discourse. The authors hope this treatment will make their argument more accessible. Subtle distinctions can be made between the connotations of the two words, but these are not central to the case the authors seek to make.

2. Harbaugh et al.

3. UNCED (1992).

4. Similar considerations apply within countries, and across different sectoral interests, but this paper will focus on equity between states.

5. It is beyond the scope of this paper to offer a detailed analysis of the many equity-related provisions of the UNFCCC and the Kyoto Protocol.

6. "Polluter pays" can be understood also as an efficiency principle: holding the polluter responsible for resulting economic damages leads to a more efficient allocation of societal resources.

7. The International Covenant on Economic, Social and Cultural Rights, and the International Covenant on Civil and Political Rights.

8. The analysis in this chapter reflects the way in which climate change is generally debated, and the conceptual framework around which the negotiating process has been built. That framework contains hidden assumptions that deserve to be examined from an equity perspective. For example, the framework encourages parties to see the response to climate change, in essence, as a set of costs, and the negotiations as a process for allocating those costs fairly. But the response to climate change can bring gain as well as pain. It is not obvious that for all countries and all timescales the costs outweigh the benefits. Likewise, the framework encourages parties to see climate policies as alternatives to other types of policy, implying that there is bound to be a tradeoff between climate goals and other objectives. In reality, all policies have multiple consequences. Policies designed to cut GHG emissions can sometimes also reduce particulate emissions, with major gains for public health. A conceptual framework based on the idea of convergent policies (i.e., policies and policy processes designed to achieve multiple aims) put forward by UK Minister of State Peter Hain would make possible more accurate equity calculations by including the ancillary benefits that climate policies can offer and the climate consequences of policies adopted for other reasons.

9. UNFCCC (1997).

10. One possible approach to this, developed by former UK government adviser Tom Burke and others but not hitherto discussed in the literature, would adjust emissions inventories to take account of trade in carbon-intensive goods. If one country buys aluminum from another, the emissions associated with its production would be cancelled from the inventory of the exporting country and added to that of the importer. As countries trade goods in and out of their economies, they would thus also transfer responsibility for the emissions associated with those goods. This would supplement, not replace, a target-based approach. But by smoothing out trade-related inequities in real time it would help address concerns about competitiveness and comparabiity of effort. Of course, a scheme of this kind would be enormously complex to operate. The technical obstacles could prove insurmountable.

11. See the Global Commons Institute "Contraction and Convergence" proposal at http://www.gci.org.uk.

12. IPCC (1997).

13. Grossman (2003).

14. See also Heller and Shukla (2003).

15. The European Community and its member states, Canada, Iceland, New Zealand, Norway, and Switzerland jointly announced their preparedness to contribute collectively 450 million Euro annually by 2005. UNFCCC (2001).

16. Personal communication with G77 and China delegate at COP6 in The Hague reflected this view. The delegate expressed the intent to reject any final agreement reached between the European Union and the United States that developing country delegates did not participate in negotiating.

17. IPCC (2001).

18. Chandler et al. (2002).

19. See also Heller and Shukla (2003).

20. Müller (2002).

21. See Aldy et al. (2003); Bodansky (2003); and Heller and Shukla (2003).

22. See also Aldy et al. (2003).

23. See UNFCCC (1997a). Footnote 7 states, "The Group of G77 and China have requested the deletion of this Article." See http://unfccc.int/resource/docs/cop3/crp02.pdf. See also Oberthür and Ott (Eds).

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