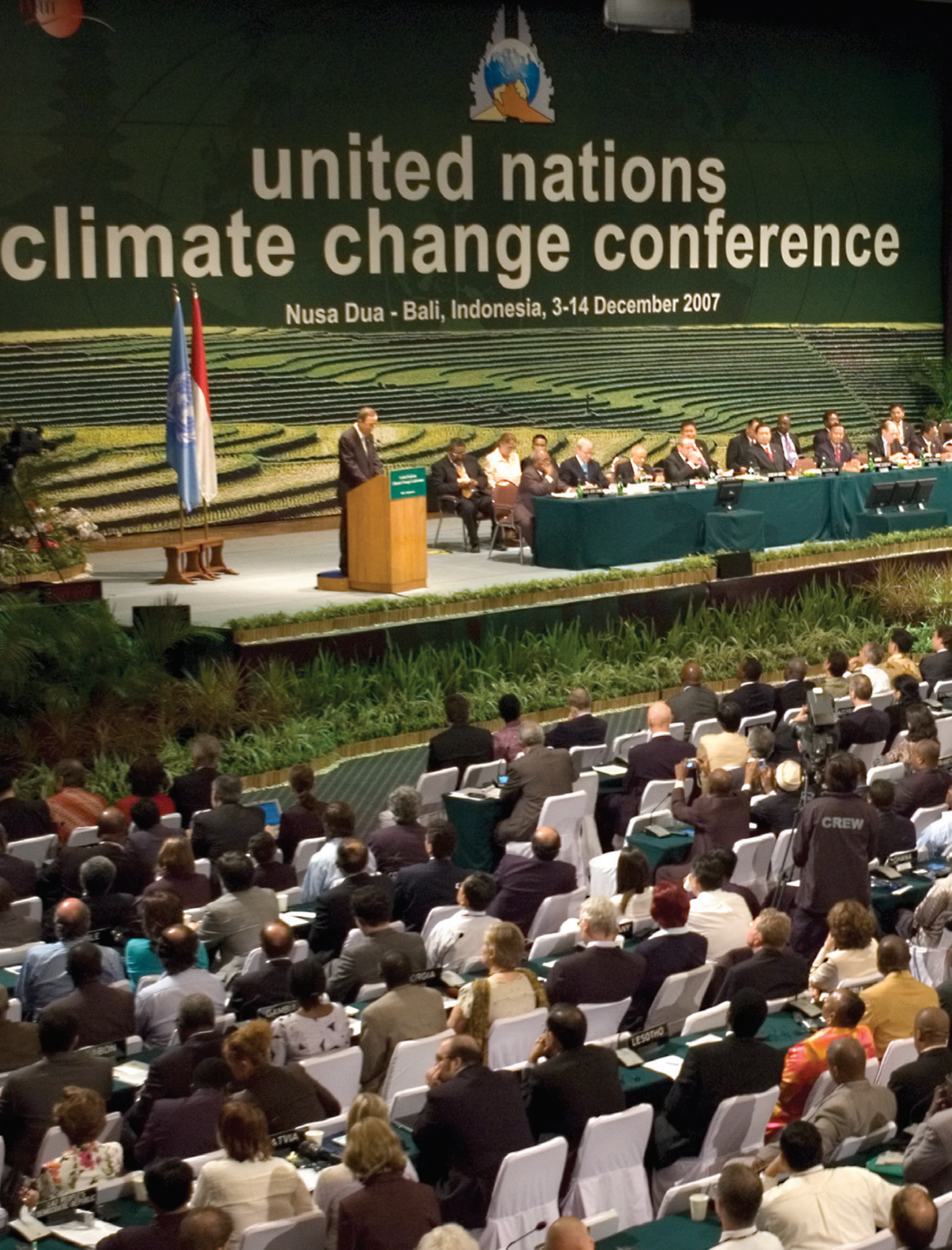
PART 2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CHAPTER 5

Integrating Development into the Global Climate Regime

Key messages

A global problem on the scale of climate change requires international coordination. Nevertheless, implementation depends on actions within countries. Therefore, an effective international climate regime must integrate development concerns, breaking free of the environment-*versus*-equity dichotomy. A multitrack framework for climate action, with different goals or policies for developed countries and developing countries, may be one way to move forward; this framework would need to consider the process for defining and measuring success. The international climate regime will also need to support the integration of adaptation into development.

The past two decades have seen the creation and evolution of an international climate regime, with the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol as the main pillars (box 5.1). Kyoto set binding international limits on the greenhouse gas emissions of developed countries. It created a carbon market to drive private investment and lower the cost of emission reductions. And it prompted countries to prepare national climate-change strategies.

But the existing global regime has major limitations. It has failed to substantially curb emissions, which have increased by 25 percent since Kyoto was negotiated.[1] It has delivered only very limited support to developing countries. Its Clean Development Mechanism (CDM) has so far brought little transformational change in countries' overall development strategies (see chapter 6 on the strengths and weaknesses of the CDM). The Global Environment Facility has invested $2.7 billion in climate projects,[2] well short of the flows needed. The global regime has so far failed to spur countries to cooperate on research and development or to mobilize significant funding for the technology transfer and deployment needed for low-carbon development (see chapter 7). Aside from encouraging poor countries to prepare National Adaptation Programs of Action, it has delivered little concrete support for adaptation efforts. And the Adaptation Fund, slow to get started, falls far short of the projected needs (see chapter 6).

In 2007 the Bali Action Plan launched negotiations to achieve an "agreed outcome" during the UNFCCC 15th session in Copenhagen in 2009. These negotiations present an opportunity to strengthen the climate regime and address its shortcomings.

Building the climate regime: Transcending the tensions between climate and development[3]

If we are to meaningfully address climate change, there is no option but to integrate development concerns and climate change. The climate problem arises from the joint evolution of economic growth and greenhouse gas emissions. An effective regime must thus provide the incentives to reconsider trajectories of industrialization and unravel the ties that have bound development to carbon. However, for ethical and practical reasons, this rethinking must include meeting development aspirations and forging an equitable climate regime.

Until recently, climate change was not seen as an opportunity to rethink industrial

BOX 5.1 *The climate regime today*

The United Nations Framework Convention on Climate Change (UNFCCC), which was adopted in 1992 and entered into force in 1994, set an ultimate objective of stabilizing atmospheric concentrations of greenhouse gases at levels that would prevent "dangerous" human interference with the climate system. It divided countries into three main groups with different types of commitments:

Annex I parties include the industrial countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic states, and several Central and Eastern European states. They commit to adopt climate-change policies and measures with the aim of reducing their greenhouse gas emissions to 1990 levels by the year 2000.

Annex II parties consist of the OECD members of Annex I, but not the EIT Parties. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the UNFCCC and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT parties and developing countries.

Non–Annex I parties are mostly developing countries. They undertake general obligations to formulate and implement national programs on mitigation and adaptation.

The ultimate decision-making body of the convention is its Conference of the Parties, which meets every year and reviews the implementation of the convention, adopts decisions to further develop the convention's rules, and negotiates substantive new commitments.

The Kyoto Protocol supplements and strengthens the convention. Adopted in 1997, it entered into force in February 2005, with 184 parties as of January 14, 2009.

At the heart of the protocol lie its legally binding emissions targets for Annex I parties, which have individual emissions targets, decided in Kyoto after intensive negotiation.

In addition to emissions targets for Annex I parties, the Kyoto Protocol contains a set of general commitments (mirroring those in the UNFCCC) that apply to all parties, such as

- Taking steps to improve the quality of emissions data,
- Mounting national mitigation and adaptation programs,
- Promoting environmentally friendly technology transfer,
- Cooperating in scientific research and international climate observation networks, and
- Supporting education, training, public awareness, and capacity-building initiatives.

The protocol broke new ground with three innovative mechanisms—Joint Implementation, the Clean Development Mechanism, and emissions trading[a]—designed to boost the cost-effectiveness of climate-change mitigation by opening ways for parties to cut emissions, or enhance carbon sinks, more cheaply abroad than at home.

The Bali Action Plan, adopted in 2007 by the parties to the UNFCCC, launched a comprehensive process to enable the full, effective, and sustained implementation of the convention through long-term cooperative action, now, up to, and beyond 2012 in order to reach an agreed outcome at the UNFCCC's 15th session in Copenhagen in December 2009.

The Bali Action Plan centered negotiations on four main building blocks—mitigation, adaptation, technology, and financing. Parties also agreed that the negotiations should address a shared vision for long-term cooperative action, including a global goal for emission reductions.

Source: Reproduced from UNFCCC 2005; UNFCCC decision 1/CP.13, http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf (accessed July 6, 2009).

a. Parties with commitments under the Kyoto Protocol have accepted targets for limiting or reducing emissions. Joint Implementation allows a country with a target to implement projects counted toward meeting their own target, but conducted in other countries that also have targets. The Clean Development Mechanism (CDM) allows a country with commitments to implement an emission-reduction project in developing countries that do not have targets. Emissions trading allows countries that have emission units to spare—emissions permitted them but not used—to sell this excess capacity to countries that are over their targets. (Adapted from http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php, accessed August 5, 2009.)

development. The climate debate was isolated from mainstream decision making on financing, investment, technology, and institutional change. That time has substantially, if not entirely, passed. Awareness of climate change among leaders and publics has grown to the level that there is now readiness to integrate climate change into development decision making.

Turning this readiness into an effective climate regime requires simultaneously addressing multiple goals involving equity, climate, and social and economic development. It would be naïve to suggest that there are no tensions among these objectives. Indeed, the very perception of tradeoffs can prove a potent political barrier to integrating climate change and development. Differences in perceptions and conceptual frameworks across high-income and developing countries can and do get in the way of a meaningful discussion on how climate action can be integrated with development. Many of these tensions emerge along North-South lines.

To ensure a climate regime that speaks to development concerns, it is useful to identify and engage opposing perspectives and then seek to transcend them. This chapter

discusses four points of tension between a climate perspective and a development perspective: environment and equity; burden sharing and opportunistic early action; a predictable climate outcome and an unpredictable development process; and conditionality in financing and ownership. These points of tension are characterizations using broad brush strokes to bring out the disagreements and their possible resolution, knowing that in practice individual country positions, in both the North and the South, are far more nuanced than the extremes described here. The second part of the chapter explores alternative approaches to integrating developing countries into the international architecture.

Mitigating climate change: Environment and equity

Since its beginning the climate regime has framed both equity and environmental goals as core elements. Over time, though, the articulation of these goals has turned their complementarities into opposition, deadlocking the progress of climate negotiations. Equity and environment have been increasingly perceived as competing ways of thinking about the problem, with countries arrayed behind these positions along predictable North-South lines.

For much of the past two decades, climate change has been construed mainly as an environmental problem. This perspective follows directly from the underlying science: greenhouse gases are accumulating in the atmosphere and causing climate impacts because of growing anthropogenic emissions, combined with limits to the ocean's and biosphere's ability to absorb greenhouse gases. In this perspective the problem is one of global collective action, and the instrument of choice is negotiated commitments for absolute reductions in emissions.

This strict focus on the environment forced the rise of a competing perspective, which construes climate change as essentially a problem of equity. Adherents to this position agree that there are environmental limits, but they see the problem as wealthy countries disproportionately occupying the finite ecological space available. In this perspective, allocation principles based on equity, such as those centered on per capita and historical emissions, should provide the basis of a fair climate regime.

Equity and environmental goals have thus become polar elements of the debate. High-income countries argue that newly industrializing countries are already large emitters and will contribute an increasing share of emissions in the future—hence the need for absolute emission reductions.[4] Industrializing and developing economies view a regime based on negotiated absolute reductions as locking in unequal emissions in perpetuity, a situation that is not viable for them. Concerns about equity have been heightened by evidence that emissions from many high-income countries have increased over the past two decades, since the initiation of climate negotiations. As the urgency of finding a solution has increased, many developing countries, particularly the large, rapidly industrializing countries, fear that attention and responsibility for mitigating emissions will be increasingly displaced onto them. The notion of "major emitters," including the large, rapidly industrializing countries, as primary drivers of the problem feeds this perception.

An effective and legitimate global climate regime will have to find a way around these opposing framings—and speak to both perspectives. To begin with, global negotiations need to be approached in a spirit of pluralism. Given the history of entrenched politics and the kernel of truth in each, neither the environmental nor the equity framing of the climate problem can, practically, be an absolute guide to negotiations, even though both are essential. Hybrid approaches seek to relocate discussions within a development frame and could usefully broaden the debate. One approach seeks to reformulate the problem around the right to develop rather than the right to emit and identifies country "responsibility" and "capacity" to act on climate change.[5] Another strand of thinking suggests the articulation of "sustainable development policies and measures" (meaning measures to place a country on a low-carbon trajectory that are fully compatible with domestic development priorities) by developing countries, combined with absolute reductions by high-income countries.[6] While the specifics of any proposal may be debated, the climate regime would be well served by a politics of

pragmatism built around the careful integration of climate and development.

But for developing countries to believe that integrating climate and development is not a slippery slope toward ever greater mitigation responsibility being displaced onto them, it will be necessary to have the backstop of an equity principle in the global regime. One example might be a long-term goal of per capita emissions across countries converging to a band; this principle could serve as a moral compass and a means of ensuring that the regime does not lock in grossly unequal emission futures. Again, while the specifics may be debated, a legitimate climate regime will need anchoring in some form of equity principle.

Given the North's historical responsibility for stocks of greenhouse gases, already supported by strong statements in the framework convention, it is hard to imagine an effective global regime that is not led by early and strong mitigation action by the developed world. The combination of early action by the North, a robust equity principle, and a spirit of pluralism in negotiations could provide the basis for transcending the environment-equity dichotomy that has plagued global climate negotiations.

Burden sharing and opportunistic early action

The environmental and equity constructions of the climate challenge share a common assumption that the challenge is a problem of burden sharing. The burden sharing language suggests that climate mitigation is going to impose considerable costs on national economies. Because current infrastructure and economic production are built on the assumption of costless carbon, building economies and societies around costly carbon will impose considerable adjustment costs. The difficult North-South politics around climate is closely tied to the burden sharing assumption, because environment and equity constructions of the problem imply very different ways of sharing a burden and therefore different political costs.

Recognizing how burden sharing contributes to entrenched politics, advocates for early climate mitigation have sought to develop a counternarrative of climate mitigation as an opportunity to be seized rather than a burden to be shared. They point out that the history of environmental regulation is littered with examples of responses to regulation that have proved less costly than feared—acid rain and ozone depletion are two well-known examples.[7] Even if climate mitigation imposes costs in the aggregate, there are relative advantages to first movers in mitigation technologies. First movers will be well placed to seize new markets that emerge as carbon is priced. Many climate-mitigation opportunities—notably energy efficiency—can be harvested at negative economic cost and bring other co-benefits for development. And in the medium term, moving first allows societies to cultivate the positive feedbacks among institutions, markets, and technology as their economies are reoriented around a low-carbon future. In its strongest variant the opportunity narrative is one of seizing advantage by moving first on climate mitigation, independent of what other countries do.

But it is important not to overplay this narrative. Conceptually the tightness of the weave between the climate and industrial development suggests that adjustment costs are likely to be substantial—and that past comparisons such as acid rain and ozone depletion are of limited relevance. Neither the stock of industrial capital built around costless carbon nor the dependence on endowments of fossil fuels can simply be wished away. Skeptics will note that, so far, the narrative of climate opportunity has not been matched by concrete actions by any major high-income country to enable developing countries to realize this opportunity.

Moreover, even if countries believe the language of opportunity, they are likely to act strategically by maintaining a public stance based on burden sharing to win a better negotiating deal, even while privately organizing to seize available opportunities. So, opportunity-seizing is unlikely to entirely dethrone burden sharing as a dominant narrative in the short run—it provides only a limited opening to change the entrenched politics of climate change.

It is important, however, that this limited opening be seized. The prospect of a silver lining of economic opportunity to the climate cloud could tip the political balance toward getting started with the hard task of turning

economies and societies toward a low-carbon future. Getting started with no prospect of an upside is a much harder sell. And starting is important, because it creates constituencies with a stake in a low-carbon future, begins the process of experimentation, and increases the costs to others of being left behind, thus generating a pull effect. That the language of opportunity seizing is not watertight does not negate its potential to counter burden sharing as the prominent construct in the climate debate (box 5.2).

Predictable climate outcome and unpredictable development process

Burden sharing is linked to the environment framing of the climate problem, from which the need emerges to set absolute reduction targets to avoid catastrophic climate change. Drawing on the recommendations of the Intergovernmental Panel on Climate Change (IPCC), some countries and advocates have urged a global goal of restricting global temperature rise to not more than 2°C, which will require reducing global emissions by at least 50 percent (the lower bound of the IPCC's range of 50–85 percent) by 2050 from their 1990 levels.[8] In response several high-income countries have submitted proposed national reduction targets (for 2050 and in some cases for interim years).[9] The underlying idea is to measure and benchmark progress toward meeting the climate challenge.

A global goal is particularly useful as a way to assess the commitment offers of the high-income world against the magnitude of the challenge. But, as discussed in chapter 4, simple arithmetic suggests that a global goal also carries implications for developing countries; the gap in reductions between the global goal and the sum of high-income country targets will have to be met by the developing world. Several developing countries therefore resist this approach as a back door into forcing commitments by the developing world or insist on a simultaneous discussion of an allocation framework.[10] This resistance stems less from opposition to the global goal and more from a sense that the language of predictability will prove a slippery slope toward translating all actions into absolute emission reductions, leading to an implicit cap on developing-country emissions.

The climate challenge looks quite different through a development lens. Building on a rich and complex intellectual history, a recent strand of development thinking focuses on institutions and institutional inertia in development (chapter 8). In this perspective formal "rules of the game" and informal norms, including those embedded in culture, are important determinants of economic incentives, institutional transformation, technological innovation, and social change. Politics is central to this process, as different actors organize to change institutions and transform incentives. Also central are the mental maps of what actors can bring to their engagement with development processes. Three key ideas are relevant here. First, development is a process of change, largely driven from below. Second, history and the past patterns of institutions matter a great deal, so common templates are of only limited use—one size does not fit all. Third, this characterization of change applies equally to high-income countries, even though the challenge of imperfect and incomplete institutions appears less daunting, and top-down policy and price signals are considered to be the main drivers of change.

In this perspective the task of low-carbon development in developing countries is a long-term process, one less amenable to being driven from above by targets and timetables than in high-income countries. Instead, changes in the direction of low-carbon development can be brought about only by internalizing this objective in the larger development processes in which bureaucracies, entrepreneurs, civil society, and citizens are already engaged. In other words, climate has to be integrated with development. An example of this approach might be rethinking urban planning in a low-carbon future, ensuring the colocation of work and residence to reduce the need for transport, designing more sustainable buildings, and devising solutions to public transport (see chapter 4). This contrasts with a target-led short-run approach, which might emphasize more fuel-efficient cars within existing urban infrastructures.

As highlighted in chapter 4, both approaches are necessary, one to yield results in the short run and the other to permit the necessary long-run transformation. The

BOX 5.2 *Some proposals for burden sharing*

Contraction and convergence
The contraction-and-convergence approach assigns every human being an equal entitlement to greenhouse gas emissions. All countries would thus move toward the same per capita emissions. Total emissions would contract over time, and per capita emissions would converge on a single figure. The actual convergence value, the path toward convergence, and the time when it is to be reached would all be negotiable.

Greenhouse Development Rights
The Greenhouse Development Rights Framework argues that those struggling against poverty should not be expected to focus their limited resources on averting climate change. Instead it argues for wealthier countries with greater capacity to pay and more responsibility for the existing stock of emissions to take on the bulk of the costs of a global mitigation and adaptation program.

The novelty of the Greenhouse Development Rights approach is that it defines and calculates national obligations on the basis of individual rather than national income. A country's capacity (resources to pay without sacrificing necessities) and responsibility (contribution to the climate problem) are thus determined by the amount of national income or emissions above a "development threshold." This is estimated at about $20 a person a day ($7,500 a person a year), with emissions assumed proportional to income. The index of capacity and responsibility under the Greenhouse Development Rights Framework would assign to the United States 29 percent of the global emission reductions needed by 2020 for 2°C stabilization, followed by the European Union (23 percent) and China (10 percent). India's share of global emission reductions would be around 1 percent.

Brazil proposal: historical responsibility
In 1997, in the negotiations leading to the Kyoto Protocol, the government of Brazil proposed that "historical responsibility" be used as the basis for apportioning the burden of mitigation among Annex I countries (meaning the countries with firm targets). The proposal sought to address "the relationship between the emissions of greenhouse gases by Parties over a period of time and the effect of such emissions in terms of climate change, as measured by the increase in global mean surface temperature." The notable feature of the proposal was the method used to distribute emission reduction burdens among countries, according to which an Annex I country's emission targets should be set on the basis of that country's relative responsibility for the global temperature rise.

The proposal included a "policy maker model" for determining emission targets for countries and suggested the need for an "agreed climate-change model" for estimating a country's contribution to global temperature increase.

Carbon budget
A research group at the Chinese Academy of Social Sciences argues that

- Greenhouse gas emission rights are a human right that ensures survival and development. Equality means ensuring equality among individuals, not among nations.
- The crux of promoting equality between individuals is to ensure the rights of the current generation. Controlling population growth is a policy option to promote sustainable development and to slow climate change.
- Given the wealth accumulated during development, which was accompanied by greenhouse gas emissions, equality today includes equity acquired in historical, current, and future development.
- Giving priority to basic needs means that the allocation of emission entitlements should reflect differences in natural environments.

If only CO_2 emissions from fossil fuels are considered and emissions peak in 2015 and fall to 50 percent of 2005 levels by 2050, the annual per capita carbon budget for 1900 to 2050 would 2.33 metric tons of CO_2. Initial carbon budget allocations for each country should be proportional to base-year population, with adjustments for natural factors such as climate, geography, and natural resources.

Developing nations, despite often being historically under budget and therefore having the right to grow and to create emissions, have no choice but to transfer their carbon budgets to developed nations in order to cover the historical excesses of developed nations and ensure basic future needs.

This historical debt amounts to some 460 gigatons of CO_2. At the current cost of $13 a ton, the value of this debt would be $59 trillion—substantially more than is currently provided to developing countries in financial assistance to combat climate change.

Continued high per capita emissions in high-income countries could partly be offset through the carbon market. But progressive carbon taxes are likely to be necessary, with the excess carried over to the next round of commitments.

Sources: Contraction and convergence: Meyer 2001. Greenhouse development rights: Baer, Athanasiou, and Kartha 2007. Brazil: submission from the government of Brazil to the UNFCCC in 1997 (http://unfccc.int/cop3/resource/docs/1997/agbm/misc01a3.htm, accessed July 7, 2009). Carbon budget: reproduced from Jiahua and Ying 2008.

two perspectives are, thus, complementary. A climate-oriented perspective can throw up a series of short-term policy prescriptions that can, in substantial measure, be implemented across countries with minimal adjustment while also yielding development benefits. Many of them are in the realm of energy efficiency, such as improved building codes, appliance standards, and the like.[11] And these approaches can be embedded in a longer-term process aimed at rethinking development through a climate lens.

But concern with the short term and the predictable should not crowd out or exclude longer-term but more fundamental transformations toward low-carbon development.

And there are risks that overly enthusiastic benchmarking of developing-country efforts to a long-term global target will do just that. As described above, many transformational measures are not subject to top-down planning and so are not subject to prediction and easy measurement. Indeed, an insistence on measurement and predictability will encourage only modest measures to minimize risks of noncompliance. In addition, any hint of an implicit target reached by subtracting high-income-country emissions from a global target encourages strategic gaming; under these conditions, countries have an incentive to persuade the international community that little can be done at home and only at high cost.

Reconciling these two perspectives may require a nested two-track approach for the short-to-medium term, at least until 2020. Consonant with the UNFCCC principle of "common but differentiated responsibility," high-income countries could agree to prioritize predictability of action aimed at carbon mitigation, to provide some assurance that the world is on track to meet the climate challenge. Here, short- and medium-term targets, for 2020 and 2030, are as significant as a target for 2050, because carbon reductions are more useful now than later and because they can win the confidence of the developing world. The developing countries could follow a second track, as discussed later in this chapter, that sets priorities for reorienting their economies and societies to low-carbon development.

These approaches, it should be clear, need not and should not compromise living standards—they should instead aggressively explore the co-benefits of development for climate. Nested within this longer-term objective, developing countries could agree to short-term "best-practice" measures—notably for energy efficiency—that bring both developmental and climate benefits. Agreeing to aggressively pursue these measures would provide some reassurance that some predictable climate gains will be realized in the short term.

The problem of financing—conditionality and ownership

The foregoing tensions are closely tied to the problematic issue of financing climate actions. There is broad agreement that high-income countries will transfer some funds to the developing world to assist specifically with adaptation—and provide separate funding for mitigation. But questions remain about how much financing will be available, its source, how its expenditure will be controlled, and on what basis it will be monitored; those questions are discussed here.

Governments of high-income countries are anxious that any funds provided be well targeted to climate mitigation or adaptation and produce real and measurable reductions (in emissions or vulnerability). To this end they envision having oversight of these funds, particularly in the current tight fiscal climate, where domestic constituencies may have little appetite for sending money overseas. This is particularly true for mitigation finance. Indeed, many high-income countries see public funds as playing a limited role in supporting climate financing in the developing world, instead envisioning that a greater proportion of funds be harnessed through market mechanisms.

Developing countries envision these funds entirely differently, as paying to help them adjust to and contribute to the mitigation of a problem not of their making. As a result, they eschew any overtones of aid and strongly resist any mechanisms of conditionality. To the contrary, they envision the use of these funds as guided by recipient-country priorities.

Elements in both positions appear reasonable. There are good arguments for not considering transfers of climate-related funds within an aid umbrella because of high-income-country responsibility for a substantial part of the climate problem. But it would appear politically difficult for high-income countries to sign a blank check without some mechanism of accountability for the funds. One way forward might be to focus on what the past teaches about conditionality as a tool.

Developing-country positions in the climate debate are, in part, shaped by the fraught history of conditionality in development debates. Civil society and other actors came to see conditionality as an instrument that undercuts democracy and forced through unpopular reforms. Because the conditions imposed did not

prove particularly effective in helping governments undertake politically difficult reforms, conditionality gave way within a decade to the almost opposite concept of borrower "ownership" of a reform agenda as a precondition for policy reform loans.[12] The lesson for climate change appears to be that—even purely on pragmatic grounds, putting aside principles connected with responsibility for the problem—conditionality is simply not an effective tool for getting governments to take measures with little domestic support.

Fortunately, there is a more productive way to conceptualize how climate funds might be used. A first step requires redirecting attention from implementing actions predetermined by a donor to organizing funding around a process to encourage recipient-country development and ownership of a low-carbon development agenda. This is similar to the poverty reduction strategy approach discussed in chapter 6, whereby donors align around a strategy designed and owned by the recipient government. Such an approach would place the emphasis on the governance mechanism for fund providers and fund recipients to collectively scrutinize and oversee climate finance.

A second step is for mitigation financing to support both low-carbon development and well-specified mitigation actions in developing countries. The concrete actions should be collectively agreed on by those providing and those receiving funds as serving the dual functions of climate mitigation and development gains. As discussed earlier, many energy-efficiency measures would be good candidates for easy agreement.

Coming to agreement on supporting low-carbon development is more amorphous and challenging. But the lesson from conditionality is that the path for low-carbon development should be developed through a process that builds considerable recipient-country ownership. The efforts of a number of governments, such as Mexico and South Africa among others, to develop a long-term carbon mitigation strategy as a basis for identifying concrete actions and seeking international support are one interesting model. The rest of this chapter discusses avenues for developing these alternative approaches.

Options for integrating developing-country actions into the global architecture

Developing countries need to be persuaded that there is a feasible route to integrating climate change and development if they are to rapidly start the transition to a low-carbon development path. If the international climate regime is to promote stronger action by developing countries, it must incorporate new approaches appropriate to their circumstances. Any mitigation effort required for the developing countries must be grounded on "a clear understanding of the economic and governance context for their development choices and their overriding development priorities."[13] The future regime must be designed in a way that recognizes their efforts to reduce their emissions while achieving their development objectives.

So far, the primary vehicle for mitigation action within the regime has been economywide emission targets pegged to historical base-year emission levels, as in the Kyoto Protocol. Such an output-based approach (focused on the emission "output") is driven by the core objective of achieving and maintaining a tolerable level of greenhouse gas concentrations in the atmosphere.[14] Fixed economywide emission targets have two advantages. They provide certainty about the environmental outcome (assuming they are met). And they allow countries considerable flexibility to choose the most suitable and cost-effective means of implementation. This target-driven approach remains appropriate for developed countries.

But such a climate-centric approach is perceived as problematic for developing countries, at least at this stage of the climate regime. Many developing countries see a cap on total emissions as a cap on economic growth. Having demonstrated their competitive success, the countries fear that the climate agenda will hold them back. These concerns spring from the fact that the principal driving forces of emissions growth in developing countries are the development imperatives of energy and economic growth. And as a practical matter, setting and adhering to an economywide emission target requires the ability to accurately measure and reliably project emissions across a

country's economy, a capacity that many developing countries now lack.

So engaging developing countries more fully in the climate regime may require alternative approaches deemed more appropriate to their circumstances. These approaches could build on the types of actions and strategies already being developed or implemented at the national level. Unlike emission targets, these actions can generally be characterized as "policy-based," centering on activities that generate emissions, rather than on emissions themselves. To achieve energy efficiency, a country could introduce a standard or incentive to shift behavior or technology. Lower greenhouse gas emissions would be one outcome, but the policy also would produce benefits more closely related to a country's core development objectives, such as greater energy affordability and access. Depending on their circumstances, countries could put forward different sets of policies or actions that address such development objectives as economic growth, energy security, and improved mobility while also delivering the co-benefit of reduced emissions.

A key question, however, is how to reconcile this approach with the urgency imparted in chapter 4—the notion that unless mitigation is immediate and global it will not be possible to maintain warming anywhere close to 2°C. New analysis, presented below, on multitrack frameworks and the impact of advance commitments suggests that a flexible approach could be effective.

An integrated multitrack climate framework

To better integrate development concerns into climate change efforts, the global climate regime must become more flexible and accommodate different national circumstances and strategies, especially for mitigation efforts. The Kyoto Protocol establishes a single type of mitigation commitment—a binding, absolute, economywide limit on emissions. This is sound from the perspectives of environmental effectiveness and economic efficiency, but as a political and practical matter it is an unlikely avenue for developing countries at this stage.

A more flexible regime integrating different approaches by different countries can be conceptualized as an "integrated multitrack" framework.[15] Many international regimes have the characteristics of such an approach. For example, the multilateral trade regime includes agreements accepted by all World Trade Organization members and plurilateral agreements among smaller groupings of members. Europe's Long-Range Transboundary Air Pollution regime and the International Convention for the Prevention of Pollution from Ships include core agreements setting forth common terms and annexes establishing differential obligations. Experiences within these arenas provide valuable lessons for climate policy makers, but the climate regime requires a distinct architecture matching a unique set of political and policy imperatives.

In broad terms, a multitrack climate regime could include at a minimum two distinct mitigation tracks:

- *Target track*. For developed countries and other countries that may be prepared to undertake such commitments, the target track would establish binding, absolute, economywide emission targets succeeding those established under the Kyoto Protocol's first commitment period. Countries with such targets would have full access to the agreement's international emissions-trading mechanisms.
- *Policy-based track*. On this track, other countries would agree to undertake nationally driven policies and actions that would have the effect of reducing emissions or emissions growth. Such policies could be sector based or economywide and could include, for example, energy-efficiency standards, renewable energy targets, fiscal measures, and land-use policies. Countries could propose individual policies or put forward comprehensive low-carbon development strategies identifying priority sectors and policies and the support needed for their implementation.

Recent modeling of such hybrid frameworks suggests that multitrack approaches score well on environmental effectiveness and equity and that the efficiency losses may be a reasonable tradeoff to achieve broad participation in policies that put countries collectively on track to greenhouse

BOX 5.3 *Multitrack approaches score well on effectiveness and equity*

Recent modeling by Battelle Memorial Institute's Joint Global Change Research Institute, in collaboration with the Pew Center on Global Climate Change, indicates that an "integrated multitrack" climate framework, in which developed countries undertake economywide emission targets and developing countries undertake nontarget policies, can produce global emission reductions by midcentury consistent with achieving atmospheric greenhouse gas concentrations of 450 ppm CO_2 by 2100.[a]

In the global policy scenarios, developed regions reduce their emissions 20 percent below 2005 levels by 2020, and 80 percent below by 2050; developing regions adopt a range of policies in the energy, transportation, industry, and buildings sectors, such as carbon-intensity goals, efficiency standards, and renewable energy targets. The specific policies, and their stringency, vary among the developing-country regions. "Policy-based crediting" awards developing regions tradable emission credits for a portion of the reductions their policies achieve (starting at 50 percent in 2020 and declining to zero in 2050).

The analysis shows global emission reductions in 2050 nearly as steep as those under an idealized "efficient" 450 ppm pathway in which full global emissions trading achieves reductions wherever and whenever they are least expensive. Globally, costs through 2050 are higher than in the efficient case, emphasizing the importance of moving toward full emissions coverage and full global trading by midcentury. But even with this loss in efficiency, costs remain below 2 percent of global gross domestic product (GDP) in 2050. Further, the policy-based crediting approach redistributes costs globally so that costs as a share of GDP are significantly lower in developing regions. In the early years, revenue from the sale of emission credits exceeds domestic mitigation costs in some developing regions, producing net economic gains.

Source: Calvin and others 2009.

a. The model does not specifically look at temperature increases. However 450 ppm CO_2 corresponds to concentrations of about 550 ppm CO_2e (a measure of all greenhouse gases, not just CO_2), hence possible temperature increases of around 3°C. At the time this report went to press, this exercise had not been conducted for 450 ppm CO_2e, which corresponds to a 40 to 50 percent probability of warming remaining below 2°C.

gas concentrations of 450 parts per million (ppm) CO_2 or 550 ppm of CO_2e (box 5.3).

Other modeling has also convincingly shown that a multitrack framework can be very effective if it provides some certainty as to when a country may commit to a binding agreement.[16] This, in fact, reduces the cost for any country of joining a binding agreement in the future because it spreads the transition over a longer period of time and investors can factor eventual policy changes into their investment choices, a process that reduces the amount of stranded assets or expensive retrofits a country can be left with.

In addition to the mitigation tracks, a comprehensive agreement would need to include

- An adaptation track to assist vulnerable countries with adaptation planning and implementation
- Cross-cutting enabling elements on technology, finance, and capacity-building support to developing countries
- Means to measure, report, and verify mitigation actions and support for the mitigation actions of developing countries, as specified under the Bali Action Plan.

Chapter 4 showed that it would be almost impossible to remain close to 2°C warming with delayed participation of developing countries. Instead multitrack frameworks permit early action but emphasize win-win options. And the models and the approaches discussed here suggest that multitrack approaches and forward-looking, predictable policies are worthwhile approaches to reconciling the need for urgent action and the priority that must be granted to development and poverty alleviation.

A policy-based mitigation track

To recognize and advance developing-country mitigation efforts, the major new element needed in the climate regime is a new category of mitigation action that is broad and supple enough to incorporate a wide variety of actions. Many developing countries have begun to identify existing and potential policies and actions at the national level that, while not driven exclusively or primarily by climate-change concerns, contribute to climate-mitigation efforts. As these policies and actions arise within national contexts, they inherently reflect a country's national circumstances and its development objectives and priorities. Indeed many of these policies are driven by development objectives such as energy access and security, better air quality, improved transportation services, and sustainable forestry, with mitigation an incidental co-benefit.

A mechanism that allows the integration of such nationally driven policies into the international framework offers four advantages to developing countries. First, it enables developing countries to contribute to the climate effort in ways that, by their own determination, are compatible with their development agendas. Second, it allows each country to come forward with a nationally defined package tailored to its circumstances, capabilities, and mitigation potential. Third, if it is coupled with a robust support mechanism, policies can be scaled or tiered to provide for stronger action on the provision of stronger support. Fourth, while providing a clear pathway for stronger mitigation efforts by developing countries, it does not bind them to quantified emission limits, which they perceive as undue constraints on their growth and development.

The case for a policy-based track has been advanced in the academic literature in different guises. One formulation, called "sustainable development policies and measures" (SD-PAMs), envisions voluntary pledges by developing countries.[17] Another proposal describes "policy-based commitments" in which the policy content might be identical to that under an SD-PAMs approach but would be reflected in the international framework as a commitment rather than a voluntary action.[18] Since the adoption of the Bali Action Plan, governments have put forward proposals addressing various aspects of how a policy-based approach could be made operational in a future climate agreement.[19]

In fashioning a new policy-based track as part of an evolving international climate framework, governments would need to consider several interrelated issues, including

- The process for countries to bring forward policies and actions and have them reflected in the international framework
- The legal character of these policies and actions
- The links to other mechanisms providing incentives and support for their implementation
- The standards and mechanisms for measuring, reporting, and verifying the policies and actions and the support for them.

Process for introducing policy actions. For country policy actions to be recognized within the international framework, governments would need to establish a process to bring them forward and, possibly, to have other parties consider and accept them. Within the negotiations, some parties have proposed the establishment of a "registry" for countries to record nationally appropriate mitigation actions they plan or propose to undertake.[20]

One critical issue is whether the process of bringing actions forward occurs in the course of negotiating a new agreement or is an outcome of those negotiations. The latter may be preferable for most developing countries. In this scenario a new agreement would establish binding emission targets for developed countries, mechanisms to support developing-country mitigation and adaptation efforts, and a process for developing countries to then define their mitigation actions. But developed countries may be reluctant to enter into binding emission targets unless the major developing countries are prepared to indicate at the same time the actions they will undertake. In that case the process of specifying those actions could be structured as part of the negotiating process, with the aim of arriving at a comprehensive agreement integrating binding targets for developed countries and specified policy actions for developing countries.

In either case, parties also need to consider whether the process should be completely open-ended, with countries free to propose any type of policy or action, or circumscribed in some way. One option proposed in the negotiations is a menu, or "tool box," of mitigation actions for developing countries to choose from.[21] The menu could identify broad categories of action, with parties invited to put forward detailed policies or action plans within the categories they choose. For consistency or comparability it may be useful to establish some form of template for countries to follow in describing their mitigation actions.

Another important consideration is quantifying the expected emission impacts of mitigation actions. Although countries participating in a policy-based track would not be committing to specific emission outcomes, other parties will want to know what

impact their actions are likely to have on their future emissions. At a minimum countries should be prepared to offer such projections. Depending on the type of process established, emission projections also could be prepared or verified by an intergovernmental body or an independent third party.

Legal character. The Bali Action Plan distinguishes between "nationally appropriate mitigation commitments or actions" by developed countries and "nationally appropriate mitigation actions" by developing countries, implying that the actions of developing countries are not to take the form of legally binding commitments. Indeed, proposals put forward by developing countries in the post-Bali negotiations, including proposals for a registry of developing-country actions, emphasize the voluntary nature of these actions.

But the Bali Action Plan does not expressly preclude commitments by developing countries, contrary to the 1995 Berlin Mandate that framed the negotiations that led to the Kyoto Protocol. In the current round of negotiations some developed countries have taken the position that actions by some developing-countries should be binding.[22] Developing countries, however, have been reluctant to take on binding commitments, at least at this stage.

Links to support. Robust efforts by developing countries will be feasible only with stronger international support. Indeed, under the Bali Action Plan, the mitigation actions of developing countries are to be "supported and enabled by technology, financing, and capacity building." Potential mechanisms to generate such support are discussed below. If parties were to establish a policy-based mitigation track for developing countries, a related question is how actions under that track would be linked to specific flows of support.

Any process to enable countries to bring forward proposed actions could, in addition, identify means and levels of support for those actions. For example, in entering a proposed action in a mitigation-action registry, a country could indicate the type and level of support needed to implement the action. Or a country might specify the level of effort it is prepared to deliver on its own, and a higher level of effort it would be prepared to undertake with support. Or recording an action in the registry could initiate a review by a designated body, using agreed criteria, to evaluate the need for support, taking into account a country's circumstances and capacities. All of these approaches could lead to a determination of support commensurate with the proposed action.

Measurement, reporting, and verification. Parties agreed in Bali that the mitigation efforts of developed and developing countries—as well as the support for developing-country efforts—are to be "measurable, reportable, and verifiable" (MRV). Effective approaches to MRV can establish and maintain parties' confidence in one another's respective efforts and in the overall regime. To be workable, MRV terms and mechanisms must balance the need for transparency and accountability against the parties' traditional concerns about sovereignty.

Reporting requirements for developing countries under the existing regime are fairly minimal—national "communications" (including emission inventories) are submitted infrequently and are not subject to review. In a future agreement the MRV of developing-country actions on a policy-based mitigation track would likely require a more rigorous approach. Parties first must consider what actions are subject to measurement and verification. Some developing countries have taken the view that MRV should apply only to actions for which they are receiving support. A second issue is whether verification is performed by the country, an international body, or a third party. In some international regimes parties verify their own actions under national systems that must conform to international guidelines. In others expert teams review parties' submissions (as for national communications and emission inventories submitted by developed countries under the UNFCCC and the Kyoto Protocol).

Third is the metrics to be employed, regardless of the means of verification. One rationale for a policy-based track is that it allows parties to pursue the types of action most appropriate to their circumstances and development objectives. This

diversity presents challenges for MRV, however, because different metrics are needed to measure and verify different types of actions (efficiency standards, renewable energy targets, carbon levies). How MRV is structured will therefore depend very heavily on how the actions are defined. In turn, the need for actions to be measurable and verifiable could strongly influence the way parties choose to define them. Somehow bounding the types of actions allowable in a policy-based track—say, by establishing a menu for parties to choose from—could make MRV more manageable.

Measurement and verification of developed-country support will likewise depend heavily on the specific types and mechanisms of support. If a new agreement were to recognize support provided through bilateral channels, criteria would be needed to determine what flows are "climate related" and "new and additional." As a general matter, support generated through a multilateral instrument, such as an international carbon levy or an auction of international emission allowances, would be more readily verifiable.

Support for developing-country mitigation efforts

The ability of developing countries to develop and effectively implement mitigation actions will depend in part on the availability of adequate and predictable support from the international community. General areas of support include finance, technology, and capacity building. These could include analyzing mitigation potentials to identify opportunities to reduce greenhouse gases with the lowest cost and highest co-benefits, developing and implementing greenhouse gas mitigation policies, disseminating and deploying the best available technologies, and measuring and verifying mitigation actions and their associated sustainable development benefits.

Adequate support will require a range of mechanisms to generate and channel public resources and to do so in a way that leverages private investment, which under any scenario will be the majority of flows available for a low-carbon transition (see chapter 6). The climate regime has two broad forms of support—public finance and market-based mechanisms—and both must be substantially scaled up in a future agreement.

Public finance

A new multilateral effort must scale up public finance in support of developing countries. Among the key issues are funding sources, funding criteria, funding instruments, links to private finance, and managing and governing any new funding mechanisms (all discussed extensively in chapter 6). This section highlights a few findings.

Most of the funds under the climate regime have relied on pledging by donor countries, resulting in inadequate and unpredictable flows. Several proposals now under discussion could produce more reliable funding streams. These include funding commitments based on agreed assessment criteria, a levy on international aviation or other greenhouse gas–generating activities, or an auction of a portion of developed countries' international emission allowances. Another option—pressed by developing countries at the UN Climate Change Conference in Poznań, Poland, in December 2008—is an extension of the existing levy on CDM transactions to the Kyoto Protocol's other market-based flexibility mechanisms (international emissions trading and Joint Implementation).[23]

Any new fund could deploy an array of funding instruments, including grants, concessional loans, loan guarantees or other risk mitigation instruments, depending on the types of activity to be supported. For technology the options include payments for access to and use of intellectual property and the associated technological know-how. Important criteria in selecting activities for funding could include the projected emission reduction per dollar of investment, a project's contribution to a host country's sustainable development objectives, or its ability to leverage carbon finance or other private investment.

Market-based mechanisms

The Kyoto Protocol's Clean Development Mechanism has generated substantial flows supporting clean energy and other greenhouse gas-reducing projects in developing countries. While the CDM has had many

successes, experience has also highlighted many concerns and areas for potential improvement (chapter 6). Beyond the reform of the original CDM model, however, parties have also begun to consider alternative approaches to emission crediting to provide incentives for investment and emission reduction on a broader scale.

As initially conceived and currently operating, the CDM generates emission credits from individual projects proposed and certified case by case. In the view of many, this project-based approach excludes many strategies with greater mitigation potential and imposes high transaction costs and administrative burdens, significantly limiting the CDM's potential to transform long-term emission trends. In an initial attempt to address these concerns, parties have authorized a "programmatic" CDM, which allows an aggregation of multiple activities over space and time as a single project. But emission reductions are still measured on the basis of discrete activities.

Alternative models now under discussion include sectoral or policy-based crediting. By allowing the generation of credits on the basis of policies or other broad programs, such approaches would help drive and support larger-scale emission-reduction efforts. Under a sectoral approach, for instance, emissions would be measured across an entire sector, and a country could earn credits for any reductions below an agreed emissions baseline. (This approach is sometimes described as "no-lose sectoral crediting," because a country faces no consequences if emissions rise above the agreed baseline.) The baseline could be set at business as usual, rewarding any deviation from projected emission levels. Or it could be set below business as usual, requiring that a country undertake some reductions on its own before qualifying for credits. Given the uncertainties in any projection of future emissions, however, the determination of business as usual is somewhat subjective and potentially quite contentious.

Under policy-based crediting a country could earn credits for verifiable reductions achieved by implementing mitigation policies recognized within the climate regime or by deploying technology action. This approach fits well with the notion of a policy-based mitigation track, providing a market-based incentive for countries to develop, put forward, and implement mitigation policies aligned with their development objectives. Methodologies could be established to quantify the reductions from different types of policy approaches. Crediting countries for all the reductions generated by their policy actions could cause an excessive supply of credits; developed countries might also object on the grounds that developing countries should bear some of the cost of their policy actions. These concerns could be addressed by issuing credits only after a certain reduction has been achieved or by discounting credits (say, by issuing one ton of credit for every two tons reduced).

Promoting international efforts to integrate adaptation into climate-smart development

Stronger international support for adaptation is a matter of need, because climate impacts are already being felt and because the poor who contribute least to the problem face the gravest risks. But adaptation efforts must extend well beyond the climate framework. As chapters 2 and 3 suggest, adaptation concerns and priorities must be integrated across the full breadth of economic and development planning and decision making, both national and international. The role of the international climate regime in particular lies with catalyzing international support and facilitating national adaptation efforts. The focus here is on how adaptation can be best promoted and facilitated under the international climate regime.

Adaptation efforts under the current climate regime

Under the UNFCCC all parties commit to undertake national adaptation measures and to cooperate in preparing for the impacts of climate change. Special consideration is given to the least developed countries for their special needs to cope with adverse effects of climate change.[24] The least developed countries are encouraged and supported under the convention to prepare a National Adaptation Program of Action identifying priority activities that respond to their urgent and

immediate needs to adapt to climate change (see chapter 8). To date, 41 least developed countries have submitted national action programs.[25] The five-year Nairobi Work Program adopted in 2005 aims to help these countries improve their understanding and assessment of the impacts of climate change and to make informed decisions on practical adaptation actions and measures.[26]

Current funding for adaptation under the UNFCCC process is mainly through the Global Environment Facility's Strategic Priority on Adaptation initiatives; additional funding will come from the UNFCCC Adaptation Fund when it is fully operational.

The international effort to date has delivered some information and capacity building on adaptation, but it has yet to facilitate significant implementation at the domestic level, access to technology, or the building of national institutions to carry the adaptation agenda forward. The effort is constrained by limited funding (see chapter 6) and the limited engagement of national planning and development agencies. The UNFCCC process has traditionally involved environment agencies; its focus on climate change may not easily lead to a comprehensive, multisectoral effort addressing adaptation.

Strengthening action on adaptation under the UNFCCC

Working through the national development process is essential to encourage early planning to strengthen climate resilience and discourage investments that heighten climate vulnerability. The UNFCCC process can complement and facilitate this process by

- *Supporting comprehensive national adaptation strategies in vulnerable countries.* These strategies would establish frameworks for action and strengthen national capacities. They would build on the National Adaptation Programs of Action, which target urgent priorities, to map out comprehensive long-term plans identifying climate risks, existing and needed adaptation capacities, and national policies and measures to fully integrate climate risk management into development decision making. In addition to organizing national adaptation efforts, the strategies could serve as a basis for targeting implementation assistance through the climate regime or through other channels.
- *Exchanging experiences and best practices, and coordinating programmatic approaches to support national, regional, and international systems for adaptation and resilience.*[27] This effort would provide guidance to countries on vulnerability assessments and on how to integrate adaptation activities into sectoral and national development planning and policies, as well as help in accessing technology for adaptation. The universal membership of the UNFCCC provides a unique forum for countries, organizations, and private entities to exchange experiences and learn from each other. Bringing national development agencies to participate in this process is essential to success. Apart from using the UNFCCC process to disseminate information, it may be useful to establish regional centers of excellence for catalyzing local, national, and regional activities. The direct impacts of climate change are felt locally, and response measures need to be tailored to local circumstances. Regional centers, with international support, can promote capacity building, coordinate research activities, and exchange experiences and best practices.
- *Providing reliable funding to assist countries in implementing high-priority measures identified in their national adaptation strategies.* Funding for adaptation largely relies on public financing (see chapter 6). Finding additional sources of adaptation finance and packaging them with existing development finance are essential for effective adaptation. Funds could come from donors, a levy on the CDM, and the tax or auction revenues from emission allowances. Equally important are defining criteria for allocating funds and setting up institutional arrangements to manage them (see chapter 6). Efficient and equitable allocation and use of adaptation finance is in everybody's interest, and wasteful use of resources can undermine public support for the whole climate agenda.

A new body under the UNFCCC may be needed to provide guidance to the parties, assess national adaptation strategies, and develop criteria for allocating resources. Such a body would need to coordinate closely with other international development agencies and have enough independence to credibly assess national strategies and resource allocation.

As mentioned early in this chapter, the current UNFCCC regime does not include adequate provisions for adaptation. The Bali Action Plan presents a great opportunity to streamline the adaptation process and mobilize adequate funding to support adaptation.

Notes

1. Energy-related emissions increased by 24 percent between 1997 (when the Kyoto Protocol was signed) and 2006; see CDIAC database (DOE 2009).

2. The Global Environment Facility (GEF) manages projects and investments through a number of multilateral organizations, in addition to functioning as the financial mechanism for international environmental conventions, including the UNFCCC. The GEF is providing $17.2 billion in cofinancing; see GEF 2009.

3. This section is drawn from Dubash 2009.

4. Absolute emission reduction entails a net decline in emissions relative to current levels, as opposed to a shift in projected emission trajectory.

5. Baer, Athanasiou, and Kartha 2007. See also box 5.2.

6. Baumert and Winkler 2005.

7. Burtraw and others 2005; Barrett 2006.

8. See focus A on science and chapter 4 for a discussion.

9. EU submission to UNFCCC, http://unfccc.int/files/kyoto_protocol/application/pdf/ecredd191108.pdf (accessed August 5, 2009).

10. India and China's submissions to the UNFCCC, http://unfccc.int/files/kyoto_protocol/application/pdf/indiasharedvisionv2.pdf and http://unfccc.int/files/kyoto_protocol/application/pdf/china240409b.pdf (accessed July 6, 2009). For a civil society perspective see Third World Network, "Understanding the European Commission's Climate Communication," http://www.twnside.org.sg/title2/climate/info.service/2009/climate.change.20090301.htm (accessed July 8, 2009).

11. For example, McKinsey Global Institute (2008) suggests that focused action in six policy areas could deliver about 40 percent of the abatement potential identified in their cost-curve approach.

12. Dollar and Pritchett 1998.

13. Heller and Shukla 2003.

14. Heller and Shukla 2003.

15. Bodansky and Diringer 2007.

16. Blanford, Richels, and Rutherford 2008; Richels, Blanford, and Rutherford, forthcoming.

17. Winkler and others 2002.

18. Lewis and Diringer 2007.

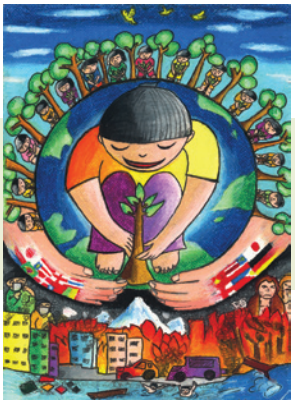
19. See, for instance, submissions to the UNFCCC from South Africa (http://unfccc.int/files/meetings/dialogue/application/pdf/working_paper_18_south_africa.pdf) and the Republic of Korea (http://unfccc.int/resource/docs/2006/smsn/parties/009.pdf) (accessed June 2009).

20. Submissions to the UNFCCC from South Africa and the Republic of Korea: http://unfccc.int/resource/docs/2006/smsn/parties/009.pdf, (accessed June 2009).

21. Submission to the UNFCCC from South Africa: http://unfccc.int/files/meetings/dialogue/application/pdf/working_paper_18_south_africa.pdf (accessed June 2009).

"Let's put in a joint effort . . . now before it's too late to save our Mama Earth."

—Sonia R. Bhayani, Kenya, age 8



Tewanat Saypan, Thailand, age 12

22. For example, in their submissions to the UNFCCC, the United States and European Union indicate that major developing countries shall commit to formulate and submit low-carbon strategies to the UNFCCC. See UNFCCC/AWGLCA/2009/MISC.4 at http://unfccc.int/resource/docs/2009/awglca6/eng/misc04p02.pdf (accessed August 5, 2009).

23. Akanle and others 2008. See http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php (accessed July 8, 2009) for information about the Kyoto Protocol's flexibility mechanisms.

24. Article 4.1 of the UNFCCC.

25. UNFCCC Secretariat, http://unfccc.int/cooperation_support/least_developed_countries_portal/submitted_napas/items/4585.php (accessed August 5, 2009).

26. Decision 2/CP.11 of the UNFCCC.

27. SEG 2007.

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