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FINANCING ADAPTATION TO CLIMATE CHANGE: ISSUES AND PRIORITIES

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and
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About this report

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Introduction

The Bali Action Plan, agreed in December 2007, launched a comprehensive process to enable the full, effective and sustained implementation of the United Nations Framework Convention on Climate Change (UNFCCC) through long-term cooperative action, now, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision in Copenhagen in December 2009. The Bali Action Plan attaches equal weight to mitigation and adaptation, and identifies technology and finance as the key mechanisms to enable developing countries to respond to climate change.

The past decade has seen a surge in research and policy analysis on ways in which technology and finance can support mitigation. Similar studies for adaptation are much more recent, and their results therefore less mature. This is a potential bottleneck in the negotiations towards an agreement in Copenhagen. This paper aims to facilitate discussions on adaptation finance by presenting a summary overview of the current state of knowledge and policy initiatives, and by outlining a number of issues that would need to be considered in the negotiation process.

Financial Needs for Adaptation

Adaptation to climate change will bring with it additional costs for both the public and the private sector. However, assessing the costs and, especially, the benefits of adaptation is considerably more complicated than it is for mitigation. Most importantly, in contrast to mitigation the performance of adaptation options cannot be measured and expressed in a single metric, e.g. CO₂ or US dollars (designated hereafter as \$). This makes it difficult for decision-makers to compare between alternative adaptation options and to consider potential trade-offs.

The Intergovernmental Panel on Climate Change in its Fourth Assessment Report (IPCC AR4) observed that the current literature on adaptation costs and benefits is quite limited and fragmented, and that equity considerations (i.e. the distribution of costs and benefits) are hardly addressed at all (Adger et al., 2007). A recent review by the Organisation for Economic Cooperation and Development (OECD) on the same subject (Agrawala & Fankhauser, 2008) found that there is very little quantified information on the costs of adaptation in developing countries, and most studies are constrained to a few sectors within countries (mostly coastal zones, to a lesser extent water, agriculture and health). In addition, these studies adopt relatively crude relationships and strong assumptions (e.g. perfect foresight and high levels of autonomous adaptation). There are almost no cross-sector studies that look at cumulative effects within countries, and only a handful of studies that look at the wider macro-economic consequences of impacts or adaptation. Moreover, most of the literature considers adaptation to average changes in temperature or sea-level rise only; very little attention has been given to more abrupt changes in mean conditions and to changes in the frequency and magnitude of extreme events.

In spite of these challenges, a number of organisations have recently published aggregate estimates of financial needs for adaptation. The UNFCCC secretariat estimated the additional investment and financial flows needed worldwide to be \$60–182 billion in 2030 (UNFCCC, 2007a), some \$28–67 billion of which would be needed in developing countries. The largest uncertainty in these estimates is in the cost of adapting infrastructure, which may require

anything between \$8–130 billion in 2030, one-third of which would be for developing countries. The UNFCCC secretariat also estimated that an additional \$52–62 billion would be needed for agriculture, water, health, ecosystem protection and coastal-zone protection, most of which would be used in developing countries (UNFCCC, 2007a).

Others arrived at similar estimates. The World Bank (2006) concluded that the incremental costs of adapting to projected impacts of climate change in developing countries are likely to be in the order of \$9–41 billion per year, while Oxfam International (2007) estimated this number to be over \$50 billion per year. The United Nations Development Programme (UNDP) has the most pessimistic estimate to date: it suggested that by 2015 financing requirements for adaptation in developing countries could amount to \$86–109 billion per year (Watkins, 2007). The reason for these organisations to focus on developing countries is that the financial needs for adaptation in these countries are a factor in global climate policy, as opposed to those in developed countries. This does not imply that adaptation is not important for developed countries, but rather that it is a domestic issue that does not require the involvement of the international community.

The above numbers are now widely cited to demonstrate the need to increase the availability of funds for adaptation in developing countries. However, Agrawala and Fankhauser (2008) expressed concern about the methodology of the studies. They argued that there has been “a premature and very rapid convergence around initial estimates that are quite sensitive to the assumptions made.” For example, all subsequent studies adopted the World Bank’s assumptions that 40% of official development assistance (ODA), 10% of foreign direct investment and 2–10% of gross domestic investment are climate-sensitive, and that the cost of climate-proofing the exposed investments is 10–20% of the financial exposure in each of these cases. According to Agrawala and Fankhauser (2008), the “consensus” on global adaptation costs, even in order of magnitude terms, may therefore be premature. In addition, in most cases the estimates do not have a direct attribution to specific adaptation activities, nor are the benefits of adaptation investments articulated. There are also issues of double-counting between sectors, and scaling up to global levels from a very limited (and often very local) evidence base. At the same time, many sectors and adaptations have not been included in the estimates.

In response to new policy developments and possibly to address some of the above concerns, a number of organisations have initiated follow-up activities. For example, the UNFCCC secretariat is preparing an update of its 2007 report, to be completed before the 14th session of the Conference of the Parties (COP14) in Poznan in December 2008. It will take into account the Bali Action Plan but not contain new cost analyses. Instead it will provide an overview of the various options and proposals available to generate and deliver the necessary financing to address climate change, including through adaptation. The UNDP has launched a capacity development project to assist up to twenty developing countries in conducting investment and financial flow assessments across different sectors and economic activities through 2030. The effort, which runs until December 2009, builds on the methodological approach developed by the 2007 UNFCCC report.

Adaptation: More than Technology Transfer and Deployment

The traditional view of adaptation tends to assume that a national government is responsible for implementing technological adaptation measures (e.g. new seed varieties, dams, early-warning systems and irrigation schemes) based on specific knowledge of future climate conditions (e.g. Carter et al., 1994). The above estimates of financial needs rely in large part on studies that took such a technology-based view of adaptation. However, this view has been challenged for three reasons (e.g. Smithers & Smit, 1997; Burton et al., 2002; Adger et al., 2003).

First, even though climate science has made great advances over the past years, it often remains difficult to project future impacts of climate change in sufficient detail to justify investment in technological adaptation measures, in particular on a local scale. An important uncertainty relates to the effect of a changing climate on the frequency, magnitude and spatial occurrence of extreme weather events, such as floods, cyclones and droughts. Planning specific measures based on projections of future climate conditions therefore presents a great challenge to developing countries.

Second, technological adaptation measures can be important in reducing vulnerability to climate change, but they do have their limitations. Three issues need to be considered here (Klein et al., 2007):

- Technological adaptation measures may be only partially effective if they do not address non-climate factors that contribute to vulnerability to climate change. For example, the technological improvement of a water supply system to ensure the availability of water during dry spells will be of limited benefit to people who do not have access to this water. The inequitable distribution of water rights or the price of the water may be more important factors in causing vulnerability to drought than deficient water supply technology.
- Technological adaptation measures may be ineffective if they are not suited to local conditions. For example, new drought-resistant crop varieties may indeed be very resistant to drought, but their acceptance in a community also depends on their costs and availability, access to fertiliser and other inputs, storage constraints, ease of preparation, flavour and so on.
- Technological adaptation measures may turn out to be maladaptive if they are implemented without recognition of relevant social and environmental processes. For example, new coastal infrastructure could disturb the offshore sediment balance, resulting in erosion in adjacent coastal areas. Irrigation can lead to the salinisation of groundwater and the degradation of wetlands, as well as leaving subsistence farmers with reduced access to groundwater and productive land.

Third, the traditional view of adaptation does not take into account the reliance of adaptation on development, and vice versa. People are vulnerable not only to climate change but to a range of other stresses, depending on factors such as health status, education and other socio-environmental circumstances shaped by political and economic processes (Kelly & Adger, 2000; O'Brien et al., 2004). Government initiatives and technological measures designed to adapt to specific changes in climate may therefore fail to address the issues considered as most urgent by local communities. These issues may include access to water and food, health and sanitation, education and livelihood security.

These three reasons for taking a broader, development-based view of adaptation suggest that the above estimates of financial needs may not reflect the reality of adaptation, and add to the concerns expressed by Agrawala and Fankhauser (2008). However, it is difficult to say whether this then implies the estimates are too high or too low. It does suggest that the process of adapting to climate change in developing countries is more complex than negotiators anticipated when they agreed on the UNFCCC in 1992. This complexity, and its implications for adaptation finance, is discussed in the remainder of this paper.

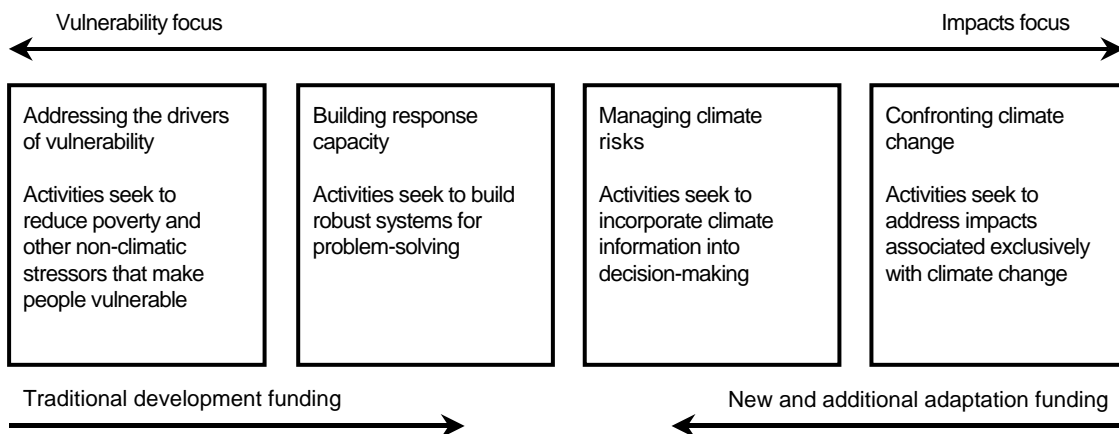
Adaptation, Development or Both?

The first empirical studies of climate adaptation (reviewed and assessed in the IPCC AR4 by Adger et al., 2007) showed that the success of adaptation in developing countries relies strongly on broader development progress. When adaptation is limited to responses specific to climate

change, it neglects the fact that vulnerability to climate change does not emerge in isolation. For example, it may help to provide a rural household that grows a particular subsistence crop with a more drought-resistant variety, but a more robust and comprehensive adaptation strategy would seek to improve food security through a set of coordinated measures that include agricultural extension, crop diversification, integrated pest management and rainwater harvesting. In addition, a poor rural household is more likely to use these options if it has a literate family member, if it has access to investment capital through local financial institutions, if it enjoys relatively intact social networks, and if it can hold policymakers accountable. In other words, it takes more than narrow, climate-focused measures to build adaptive capacity.

A recent study by McGray et al. (2007) confirmed this view. It reviewed more than 100 initiatives labelled as adaptation in developing countries and found that in practice there is little difference between these adaptation initiatives and what can be considered good development. The difference lies more in the definition of the problem and the setting of priorities than in the implementation of solutions. The study presented adaptation as a continuum, ranging from more narrowly defined activities aimed specifically at addressing impacts of climate change, to building response capacity and addressing the drivers of vulnerability (see Figure 1).

Figure 1. Adaptation as a continuum from addressing the drivers of vulnerability to confronting the impacts of climate change



Source: Adapted from McGray et al. (2007).

Many developing countries have already begun to integrate climate risks into their mainstream sectoral and national development planning. The benefit of this integration effort, often referred to as “mainstreaming”, would be to reduce the sensitivity of development activities to both today’s and tomorrow’s climate, thus ensuring the effectiveness and sustainability of investments. India, for example, has adopted policies to reduce risks and enhance the adaptive capacity of its most vulnerable sectors and groups. The policies are primarily driven by the objective of ensuring sustainable livelihoods and alleviating poverty. For example, adaptation in the agricultural sector includes the development of drought-resistant crop varieties, the promotion of crop diversification and the extension of the National Agricultural Insurance Scheme. Overall, India reports to be spending 2% of its gross domestic product on adaptation activities in the areas of agriculture, water resources, health and sanitation, coastal zones, forests and disaster risk reduction (Ray, 2007).

Discussions on mainstreaming are most advanced in the context of ODA, which still contributes a substantial share to the income of many developing countries, particularly the least developed countries (LDCs). In April 2006 the OECD organised a ministerial-level meeting of its

Development Assistance Committee and its Environment Policy Committee. The meeting served to launch a process to work in partnership with developing countries to integrate environmental factors efficiently into national development policies and poverty reduction strategies. The outcomes of the meeting were an agreed Framework for Common Action Around Shared Goals, as well as a Declaration on Integrating Climate Change Adaptation into Development Cooperation. These outcomes are providing an impetus to all development agencies to consider climate change in their operations and thus facilitate mainstreaming. The OECD is currently preparing practical guidance for doing so.

Priorities for Adaptation in Developing Countries

Since 2001 the LDCs have been preparing national adaptation programmes of action (NAPAs), which allow these countries to identify priority activities that respond to their urgent and immediate adaptation needs. The rationale for preparing NAPAs is based on the limited ability of LDCs to adapt and the recognition that activities proposed through NAPAs would be those whose further delay could increase vulnerability or lead to increased costs at a later stage. So far 38 LDCs have completed their NAPAs, of which eleven are now in various stages of implementing priority activities.

One of the features of the NAPAs is that they do not establish a parallel planning process but rather attempt to build on national development goals and integrate adaptation into existing national plans. For example, Gambia established a project steering committee chaired by a Permanent Secretary, with representatives from the National Assembly and from government departments responsible for budgetary issues, poverty alleviation, and oversight of local government and decentralisation. In many LDCs the NAPA process has strengthened institutional capacity at the national level, thus improving the countries' ability to integrate adaptation into sectoral planning and decision-making. Rwanda, for example, identifies adaptation as a development priority in its latest Economic Development and Poverty Reduction Strategy (EDPRS), which covers the period 2008–11. Rwanda aims to develop sectoral strategies to implement the EDRPS while taking into account the priorities it identified in its NAPA.

Collectively the NAPAs give a good indication of the kind of adaptation activities that are seen as high priority by the large and diverse group of least developed countries. Additional insights are gained from other UNFCCC national reporting mechanisms, such as the National Communications and the Technology Needs Assessments (TNAs), and from regional workshops. In a review of the 17 NAPAs that had been completed by June 2007, the UNFCCC secretariat found that agriculture, forestry and fisheries is by far the most prioritised sector, followed by water supplies, extreme events, and capacity building (UNFCCC, 2007a). Infrastructure was not identified as a priority sector, which is at least in part due to the fact that infrastructure for, for example, flood protection was classified in the sector extreme events. The prioritisation of the agriculture and water sectors, which are key to many developing-country economies and livelihoods, suggests that adaptation is indeed closely connected to the need for broad economic and social development. The measures proposed in the NAPAs for these sectors would reduce vulnerability to climate variability as well as to climate change. The need for development within these sectors is augmented rather than created by the climate change challenge. The 2008 update of UNFCCC (2007a) will incorporate a review of all 38 NAPAs that are currently available.

The TNAs submitted by Parties give a similar message. A review by the UNFCCC secretariat found that 62.5% of Parties had identified agriculture and fisheries as a priority sector for adaptation technology. In particular, crop management was seen as a priority issue. Other

priority sectors identified by Parties were coastal zone management, water, and health (UNFCCC, 2007a).

Of the 17 NAPAs considered by the UNFCCC secretariat, 16 included cost estimates of the prioritised adaptation activities. These 16 NAPAs had been prepared by Bangladesh, Bhutan, Burundi, Cambodia, the Comoros, Djibouti, Eritrea, Haiti, Kiribati, Lesotho, Madagascar, Malawi, Mauritania, Rwanda, Samoa and Senegal. The total cost estimate for these countries was \$292 million, with individual country estimates ranging from \$3.6 million for the Comoros to \$74 million for Bangladesh. Table 1 lists the priority activities by sector as identified in the NAPAs, along with the total cost estimates of the 16 NAPAs for each sector. A slightly more recent review of 22 NAPAs by Agrawala and Fankhauser (2008) arrived at an estimated total cost of priority adaptation activities of \$472 million.

As for the type of adaptation activities identified in the NAPAs, Table 1 suggests that developing countries need a mix of 'hard', technological measures and 'soft' measures for reducing vulnerability and building adaptive capacity. For example, promoting agricultural techniques and irrigation methods to fight salinity is proposed along with economic diversification of vulnerable rural communities and research on crop varieties. The NAPAs suggest that the LDCs are not biased towards either end of the adaptation continuum (Figure 1) but instead recognise the need for comprehensive strategies.

Table 1. Adaptation activities to meet urgent and immediate needs of the least developed countries, as expressed in the NAPAs, including aggregate cost estimates

Sector and prioritised activities	Total cost estimate in 16 NAPAS
Agriculture, forestry and fisheries – resistant crop and livestock varieties, diversification of activities for rural communities, advancing food security (seed and food banks), community-based forest projects, improving veterinary services, promoting agricultural techniques and irrigation methods to fight salinity	\$129 million
Water supplies – protect water infrastructure, improve management of surface water, construct storage facilities, water-harvesting, improve watershed management and monitoring, raise community awareness	\$50 million
Extreme events – installation of early-warning systems, measures for flood prevention (e.g. flood dykes) and coping with droughts, community disaster preparedness and response capacity	\$35 million
Capacity building incl. research – upgrade meteorological services, explore options for insurance, research on crop varieties, awareness-raising and information dissemination	\$35 million
Coastal zones – integrated coastal zone management, construct and upgrade coastal defences and causeways, mangrove planting	\$15 million
Natural ecosystems	\$12 million
Infrastructure – development of communications and telecommunications infrastructure, road protection	\$6 million
Human health – development of health infrastructures, increase immunisation, measures to combat spread of malaria, training and awareness raising of medical personnel	\$3 million
National policies	\$3 million

Source: UNFCCC (2007a).

In addition to identifying concrete and sector-specific adaptation measures, developing countries also articulated their needs and priorities with regards to generic and cross-sectoral measures for facilitating adaptation and building adaptive capacity. In 2007 the UNFCCC secretariat held three regional workshops and one expert meeting to assist in the identification of specific adaptation needs and concerns in developing countries, at the request of the COP. A total of 96 developing countries participated in these meetings. The workshop synthesis (UNFCCC, 2007b) showed that a menu of generic tools and means for adaptation is needed, including capacity building for conducting vulnerability and adaptation assessment, establishment of hydro-meteorological networks, promotion of regional collaboration and centres of excellence, improvement of climate data and modelling techniques, and integration of top-down and bottom-up (community-based) approaches to adaptation assessment. In addition, participants in the Nairobi Work Programme workshop on adaptation planning and practices called for integration across sectors, levels and development (UNFCCC, 2007c).

Current Sources of Adaptation Finance

In spite of the many efforts already made by developing countries, in many cases external support will be required to meet adaptation needs. Article 4.4 of the UNFCCC commits developed countries to assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects. This assistance is understood to come in the form of new and additional funding (i.e. beyond what developed countries are already planning to provide as ODA).

In 2001 COP7 established three funds to support adaptation activities in developing countries: the Least Developed Countries Fund and the Special Climate Change Fund under the UNFCCC, and the Adaptation Fund under the Kyoto Protocol. The two funds under the UNFCCC are operational and managed by the Global Environment Facility (GEF), as is the Strategic Priority “Piloting an Operational Approach to Adaptation”, which the GEF established under its Trust Fund. The operational GEF funds provide funding to eligible countries to meet the additional costs of adaptation. The remaining costs are to be borne either by the recipient country and/or by other bilateral or multilateral donors. As of March 2008, \$270 million had been pledged for adaptation under the Least Developed Countries Fund and the Special Climate Change Fund, of which \$50 million has been allocated. The GEF will present an update of these numbers at COP14, but they are unlikely to be very different.

The Adaptation Fund is not yet operational. As decided by the COP serving as the Meeting of the Parties to the Kyoto Protocol (CMP) in 2007, it will be managed by a special Adaptation Fund Board (AFB). The AFB is developing specific operational policies and guidelines to be approved by the CMP in Poznan in December 2008. The Adaptation Fund is the first financial instrument under the UNFCCC and its Kyoto Protocol that is not based solely on voluntary contributions from donor countries. It receives a 2% share of proceeds from project activities under the Clean Development Mechanism (CDM) and can also receive funds from other sources to fund concrete adaptation projects. The actual amount of money that will be available from the fund depends on how much the CDM is used and on the price of carbon. According to a World Bank estimate it is likely to total \$100–500 million by 2012, possibly increasing to \$2 billion per year thereafter (Noble, 2008). Watkins (2007) estimated that the Adaptation Fund could generate between \$160–950 million by 2012.

In many developing countries ODA can play a major part in supporting adaptation. The OECD estimated that in Nepal, for example, as much as 50–65% of total ODA is directed at activities potentially affected by climate risks (Agrawala, 2005). At the same time, more than 60% of all ODA from OECD countries could positively contribute towards adaptation and adaptive capacity (Levina, 2007). This suggests that it is possible to create synergies between ODA and

adaptation investments, for example through mainstreaming. On the other hand, the current set up of adaptation funding under the UNFCCC and the tendency of ODA to move from supporting project-based activities towards providing programme and budget support may make it difficult for mainstreaming to happen in practice. At the same time, however, the need for adaptation investments in developing countries becomes increasingly evident, and the willingness of developed countries to make funds available increases as well.

Nonetheless, developing countries are concerned that as a result of donors' seeking to create synergies, funding for adaptation will not be new and additional but in effect will be absorbed into ODA budgets of a fixed or even decreasing size. The concern is fuelled by the fact that the amount of money available in the current funds for adaptation is only a fraction of the aforementioned estimated investment needs in developing countries. Moreover, only a handful of countries have achieved the target, reaffirmed most recently in Monterrey, of providing 0.7% of their gross national income as ODA. The OECD (2008) estimated that in 2006 only about \$40 billion was available as "programmable aid" (i.e. total ODA less debt-forgiveness grants, bilateral humanitarian aid, administration costs, in-donor country refugee costs and imputed student costs), which again is considerably less than some of the aforementioned investment needs for adaptation. A second, related concern is that mainstreaming could divert any new and additional funds for adaptation into more general development activities, which limits the opportunity to evaluate, at least quantitatively, their benefits with respect to climate change specifically. Third, there is concern that donors' use of ODA to pursue mainstreamed adaptation could impose conditionalities on what should be a country-driven process. Table 2 summarises the pros and cons of both stand-alone adaptation and mainstreamed adaptation in the context of adaptation funding.

Table 2. Pros and cons of stand-alone adaptation and mainstreamed adaptation in the context of adaptation funding, as perceived and expressed during UNFCCC negotiations

	Stand-alone adaptation	Mainstreamed adaptation
Pro	Easy to calculate new and additional funding needs Greater country ownership	More efficient in implementation More effective, more sustainable impacts
Con	High administrative costs when scaled up Synergies with development may be missed	Difficult funding situation, possibly diverting ODA Seen as imposing conditionalities

Source: Klein (2008).

To address these concerns it will be necessary for the developed and developing countries to develop a mutual understanding that leads to agreed answers to the following two questions (Klein, 2008):

- Should adaptation be designed as stand-alone activities or should it be mainstreamed into development projects and programmes?
- Should the provision of support for adaptation follow the polluter-pays principle or is it an additional focus of ODA?

In reality these questions are not either/or questions, as the answers depend on the type of adaptation being considered and on what it is trying to achieve (see Figure 1). However, the current climate negotiations under the UNFCCC, in particular those on adaptation funding for developing countries, are leaving little room for such nuance. Moreover, within the context of the negotiations the two questions are related, and the absence of an agreed answer to the second question renders the first question politically charged. What is essentially an operational question has become a political question that uses "stand-alone adaptation" and "mainstreamed

adaptation” as proxies for different negotiation perspectives on adaptation funding. As mentioned above, developing countries are concerned that efforts to promote the mainstreaming of adaptation are in fact a ploy of the developed countries to avoid providing new and additional funding for adaptation. As recently as the UNFCCC subsidiary bodies meeting in June 2008, developing countries called for stand-alone adaptation activities, as these would allow for the measurable, reportable and verifiable use of new and additional funding, as stipulated in the Bali Action Plan.

Modalities of Future Adaptation Financing

Regardless of whether they are used to support stand-alone or mainstreamed activities, existing and expected resources fall short of the estimated costs of adaptation by roughly two orders of magnitude. Substantially more financial resources are needed. A number of developed countries and development banks are in the process of setting up separate ODA-based funds that could also support adaptation activities in developing countries, thus complementing or competing with the GEF funds and the Adaptation Fund. The new funds, which all target both mitigation and adaptation, include the Environmental Transformation Fund of the United Kingdom, Japan’s Cool Earth Partnership, the International Climate Protection Initiative of Germany, and the Climate Investment Funds created under the World Bank. In September 2008, 10 countries (Australia, France, Germany, Japan, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom and the United States) pledged a total of more than \$6.1 billion to the Climate Investment Funds, which include a Clean Technology Fund and a Strategic Climate Fund. Part of the latter fund is the Pilot Program for Climate Resilience, which will support adaptation. \$642.5 million of the \$6.1 billion have been allocated for this. In addition to these funds, the European Commission and the World Bank are discussing a Global Climate Financing Mechanism. For more details about adaptation financing modalities and the proposed funds see Haites (2008), Müller (2008) and Porter et al. (2008).

In spite of the promise of additional funding for adaptation, there has been concern that these funds are donor-driven, that money may be made available as loans instead of grants, and that possible competition between these funds and those under the UNFCCC and the Kyoto Protocol may lead to a decoupling of adaptation and mitigation in the climate negotiations. Taking adaptation financing largely off the agenda of the negotiations could undermine the developing countries’ position that support for adaptation is a moral imperative for the developed countries, which has to go hand in hand with emission reductions. It could therefore limit developing countries’ willingness to accept mitigation actions and, as a result, weaken the carbon market. The carbon market, created by the Kyoto Protocol, has the potential to move huge financial flows to developing countries for mitigation and adaptation. In theory the carbon market could make a future climate agreement self-financing: if emission targets were ambitious the price of carbon would rise significantly, which would increase financial flows to developing countries.

The aforementioned Adaptation Fund is the first example of the use of market-based options to generate substantial financial resources to address climate change (as opposed to using ODA). However, instead of taxing carbon emissions (which would be in line with the polluter-pays principle), it taxes carbon exchanges, which provides a disincentive to investments in developing countries. Nonetheless, developing countries and many non-governmental organisations see the institutional set-up of the Adaptation Fund as superior to those of the separate funds that are being established (e.g. Porter et al., 2008). In particular the direct representation of developing countries on the AFB and the fact that applicant countries can choose their own implementing entities are seen as strong improvements on the existing GEF-managed funds under the UNFCCC. The GEF has been criticised for the way in which it has

managed the funds for adaptation under the UNFCCC (e.g. Möhner & Klein, 2007), and it has yet to gain widespread support for its role as the secretariat of the AFB.

In addition to the current 2% levy on the CDM, the carbon market can be used in a number of different ways to generate financial resources for adaptation. This year Norway, Switzerland, China and Mexico have all submitted proposals to this effect, while the Philippines on behalf of the G77 and China, and the European Union have made submissions that discuss the funding architecture. Müller (2008) discussed the options put forward by Parties as well as other options, including a levy on air travel. He argued that the options for generating adaptation funding should meet at least five criteria: new and additional, predictable, appropriate, equitable, and adequate. He found that funding schemes whereby money is raised and disbursed through national budgets (such as China's proposal that developed countries make available 0.5% of their gross domestic product for adaptation in developing countries) do not meet the criteria, in particular the predictability criterion. The proposals that foresee raising funds through international markets (i.e. the CDM levy, the Norwegian proposal, the international aviation levy, and the international maritime emissions reduction scheme) satisfy more of the criteria, except adequacy. Müller (2008) concluded that the most interesting option could be the Norwegian proposal for an international auction of assigned amount units and some form of solidarity levy on bunker fuel activities.

Official national and multilateral strategies for adaptation in developing countries focus on public policies and investments, but there is also an emerging interest in private or public/private partnership initiatives on adaptation, and how public policy can stimulate such initiatives. In particular, several potential insurance-related options have been identified, including multi-state risk pooling mechanisms, regional reinsurance facilities, catastrophe funds linked to international financial markets, national/regional disaster funds supported financially by the international community, micro-insurance, generation of carbon credits in exchange for support for insurance, and weather derivatives that provide payouts in response to weather triggers rather than in response to demonstrated losses (UNFCCC, 2007b). This diverse group of options involves different kinds of burden-sharing between public bodies and private individuals, as well as between developing countries and developed countries. Further dialogues with the private sector, in particular the finance sector, would be needed to pursue these options.

Issues to Consider by Negotiators

In the Investment and Financial Flows report, the UNFCCC secretariat identified the needs to scale up current levels of adaptation funding, to involve the private sector, and to optimise governance structures (UNFCCC, 2007a). Yet there are several other contentious issues in the current debate on adaptation financing. They revolve not only around the amounts required, the sources of funding and the delivery mechanisms, but also around the moral and legal framing of adaptation financing.

The European Union and other Annex I Parties tend to describe bilateral or multilateral funding as catalytic and complementary only to domestic and private funding by developing countries, whereas developing countries view adaptation funding as compensation for harm imposed on them. It is a universal ethical principle that it is wrong to harm others (or risk harming them) for one's own gain, and that one owes compensation if one does such harm. Over time this moral principle has become firmly encoded in national case law and legal reasoning with respect to environmental pollution within national boundaries. International law echoes the same principle. The Stockholm Declaration of 1972 declares in Principle 21 (reaffirmed in Principle 2 of the Rio Declaration) that states have "the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction" and reiterates in Principle 22 that "States shall

cooperate to develop further the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction". Thus, there is a legal basis for a principle-based and transparent process for determining national burden-sharing contributions to international adaptation funding.

The aforementioned concerns of developing countries about the possible inadvertent consequences of mainstreaming need to be taken seriously. Steps need to be taken to reassure developing countries that there will indeed be new and additional funding for adaptation, which complements rather than competes with ODA. To this end it will be necessary to be clear about the two questions mentioned earlier. As for the first question (Should adaptation be designed as stand-alone activities or should it be mainstreamed into development projects and programmes?), there is no need to make an a priori decision for stand-alone adaptation or for mainstreaming. Instead, the choice of one or the other should be an outcome of a country-driven national planning process. National adaptation planning in developing countries needs to be supported under the UNFCCC, and developed countries must provide follow-up support to implement adaptation activities identified in these national plans.

As for the second question (Should the provision of support for adaptation follow the polluter-pays principle or is it an additional focus of ODA?) it then depends on the nature of these activities whether ODA or new and additional funding is most appropriate to support adaptation to climate change. ODA could be used to support activities that fit in the two boxes on the left-hand side of Figure 1 (addressing the drivers of vulnerability and building response capacity), while new and additional funding could support activities corresponding with the two boxes on the right-hand side (managing climate risks and confronting climate change). The COP should provide clarity on how traditional ODA, the Adaptation Fund and various other bilateral and multilateral funds for adaptation can complement one another.

As mentioned earlier, the carbon market provides an excellent opportunity to generate new and additional funds for adaptation. Germany has been quick to realise this. It earmarked 8.8% of the proceeds of this year's auction of allocated emission rights to adaptation and mitigation activities. Half of this would be used domestically, the other half in developing countries. Such earmarking of public funds is not legally possible in all OECD member states, but this situation may change during the negotiations. However, while Germany is creating new and additional funds, it has also stated its intention to consider as ODA the 4.4% that is to be spent in developing countries. This runs the risk of undermining ongoing efforts to meet the target of providing 0.7% of gross national product as conventional ODA. It could also fuel developing countries' concerns that adaptation funding leads to a diversion of ODA at the expense of non-climate issues.

Finally, clarity needs to be created on the emergence and use of the various bilateral and multilateral funds for adaptation. Confusion and a lack of transparency due to a proliferation of funds are the last things developing countries need when seeking support for their adaptation activities. As stated by the chair in his summary of views expressed during the second session of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (UNFCCC, 2008), "Parties expressed concern over the fragmentation of available funding both within and outside the UNFCCC process and the conditions imposed for accessing it. The need to understand and remedy these constraints by streamlining funding mechanisms was emphasized." In addition, "[m]any Parties expressed their preference for a funding mechanism for adaptation that is governed within the ambit of the Convention and emphasized the need for funding that is appropriate, sufficient and predictable" (UNFCCC, 2008).

The Adaptation Fund is not yet operational and there is the risk of it being overshadowed by other funds, mentioned earlier. One way of creating clarity on the distinction between the funds

would be to feed new and additional resources to the Adaptation Fund (including but not limited to those generated by the carbon market, and use the fund to support concrete adaptation activities (i.e. the activities represented by the two right-hand boxes in Figure 1). The donor-initiated funds could then be fed by contributions that count as ODA, and these funds would be used to support the activities in the two left-hand boxes in Figure 1).

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The ECP is a joint initiative of the Climate Policy Research Programme (Clipore) of the Swedish Foundation for Strategic Environmental Research (Mistra) in Stockholm and the Centre for European Policy Studies (CEPS) in Brussels. Established in 2005, the ECP aims to facilitate interaction within the policy research community, mainly but not exclusively in Europe. Its working methods consist of bringing together a select number of policy-makers, negotiators and experts to vigorously debate key topics in the area of international climate change policy and to widely disseminate its conclusions. The ECP actively seeks dialogue with policy-makers and other stakeholders while being dedicated to academic excellence, unqualified independence and policy relevance. The ECP is governed by a steering group, drawn from government and academia. For further information, see: http://www.ceps.eu/Article.php?article_id=484.

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