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Financing climate change adaptation

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This paper examines the topic of financing adaptation in future climate change policies. A major question is whether adaptation in developing countries should be financed under the 1992 United Nations Framework Convention on Climate Change (UNFCCC), or whether funding should come from other sources. We present an overview of financial resources and propose the employment of a two-track approach: one track that attempts to secure climate change adaptation funding under the UNFCCC; and a second track that improves mainstreaming of climate risk management in development efforts. Developed countries would need to demonstrate much greater commitment to the funding of adaptation measures if the UNFCCC were to cover a substantial part of the costs. The mainstreaming of climate change adaptation could follow a risk management path, particularly in relation to disaster risk reduction. 'Climate-proofing' of development projects that currently do not consider climate and weather risks could improve their sustainability.

Keywords: adaptation, climate change, disaster risk reduction, finance

Introduction

Although the 1997 Kyoto Protocol entered into force on 16 February 2005, proposed reductions in greenhouse gas emissions will probably not prevent climate change from affecting the natural earth system and human societies. Adaptation, therefore, is an effort increasingly seen as complementary to greenhouse gas emissions reduction and is an inevitable answer to the challenges posed by climate change (see, for example, Smit et al., 1999; Burton, 2000; Aerts and Droogers, 2004). The Intergovernmental Panel on Climate Change (IPCC) has defined adaptation as the 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (McCarthy et al., 2001). The people most vulnerable to the adverse effects of climate change are the poor; considerable effort will have to be made to help them cope with the new climatic circumstances (see, for instance, Mirza, 2003). Adaptation is expected to be increasingly important in future climate policies, but explicit funding possibilities for adaptation activities are limited.

At the same time, the demand for adaptation is still unclear. The total costs of adaptation are very difficult to estimate, due to the dependency of vulnerability on local characteristics and changes in vulnerability over time. Global adaptation costs are estimated only to comprise around 7–10% of the cost of total global damage due to climate change (Tol, Fankhauser and Smith, 1998). Current adaptation frameworks do not address the investments made during development and economic transition and their potential for adaptation, since most adaptation and impact studies assume economic equilibrium now and in the future.

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Both the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the 1997 Kyoto Protocol contain provisions on adaptation and its funding. The Kyoto Protocol Adaptation Fund, which will support concrete adaptation projects and programmes in Annex II parties (developing countries) to the UNFCCC, is likely to start functioning after 2008. In developing countries, financial, technical and institutional characteristics result in a relatively low capacity to adapt, while more developed countries have a relatively high capacity to do so. This leads to the following question: who will and who will not get funding for adaptation under the UNFCCC? It is vital that clear rules and criteria are developed for the allocation of available international financial resources for adaptation. Opportunities in this regard involve the combination of UNFCCC funds for adaptation and other resources, such as public expenditures, official development assistance (ODA) and development bank loans.

With respect to the next climate change agreement, it may be necessary to include adaptation in a more fundamental manner than has been the case to date. Additionally, since adaptation affects economic, environmental and social conditions, and vice versa, it could be considered within a framework of integrated risk management and sustainable development. Another important issue concerns how an adaptation policy could be institutionally framed, internationally, nationally and locally. Internationally, for example, it could take the form of a separate protocol, as some have suggested, or be an integrated part of a new treaty (see, for instance, Huq and Reid, 2004). At the national and local level, meanwhile, sectoral policy and development planning related to water resources management and coastal zone management could increasingly incorporate climate change adaptation.

This paper outlines the issue of funding of adaptation and paints a broad picture of options, within and without the UNFCCC. The focus is mostly on the position of developing countries vis-à-vis funding adaptation measures and adaptation policy. The paper attempts to:

- assess alternatives for meeting climate change adaptation costs, especially for developing countries (second section);
- evaluate funding choices, where funding for adaptation under a new (post-2012) climate agreement can be distinguished from a situation in which it is secured from other sources (mainstreaming) (third section); and
- provide some recommendations for future adaptation policies (fourth section)

Current and potential funding of adaptation

Adaptation measures can be financed in many ways. Current and potential future sources of funding for climate change adaptation include:

- funds under the UNFCCC;
- the Global Environment Facility (GEF);
- non-compliance fund;

- disaster relief and risk reduction;
- public expenditures, including public–private partnerships (PPPs);
- insurance and disaster pooling;
- development assistance; and
- foreign direct investment (FDI).

Funds under the UNFCCC

According to Article 4.1 of the UNFCCC, states parties should 'protect the climate system for the benefit of present and future generations, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities'. For that reason, developed country parties should take the lead in combating climate change and the adverse effects thereof. Moreover, the UNFCCC calls on developed countries to meet the agreed incremental costs of adaptation in full (Article 4.3). And '(t)he developed country Parties . . . shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation to those adverse effects' (Article 4.4). However, the text does not include any quantitative commitments on the financing of adaptation.

The UNFCCC recognised the increasing importance of adaptation measures and building adaptive capacity. During the sixth Conference of Parties (COP6) in Bonn, Germany, in July 2001, three funds were created: the Special Climate Change Fund; the Least Developed Countries Fund; and the Adaptation Fund. At COP7 in Marrakech, Morocco, in November 2001, it was agreed that these funds would be disbursed through the GEF.

The modalities of these three adaptation funds and the ways in which parties to the UNFCCC will contribute to them were not fully elaborated on at COP7. Funding conditions and targets have to be established by the COP and the Meeting of the Parties on programmes, priorities and eligibility criteria for the funding of adaptation activities. At COP9, however, Canada, the European Union (EU), Iceland, New Zealand, Norway and Switzerland together reconfirmed the earlier pledge of USD 410 million by 2005 (UNFCCC decision 7/CP.7) for the Special Climate Change Fund and the Least Developed Countries Fund. These are discussed in more detail below.

Special Climate Change Fund

This fund aims in particular to support adaptation, energy, forestry, industry, technology transfers, transport, waste management and activities to assist developing country parties in diversifying their economies. With regard to adaptation, it supports developing countries in preparing their (initial) National Communications to the UNFCCC (Stage I activities, see Table 1) and in strengthening implementation of adaptation activities related to the National Communications or in-depth national studies (Stage II). Moreover, support is provided for various activities relating to information networks, development and implementation of climate-related institutions and of prioritised projects identified in the National Communications, awareness raising and building (institutional) capacity to implement preventive measures, planning, disaster preparedness

Table 1 Stages in UNFCCC adaptation activities

Stage	Stage I: planning (short term)	Stage II: preparation (medium term)	Stage III: initiation (long term)
Parties involved	All	Particularly vulnerable countries or regions	Particularly vulnerable countries or regions
Activities	• Studies of possible impacts of climate change • Appropriate capacity-building • Identification of options for adaptation • Identification of particularly vulnerable countries or regions	• Measures to prepare for adaptation, including further capacity-building and development of appropriate adaptation plans	• Measures to facilitate adaptation, including insurance and other adaptation measures

Source: UNFCCC document FCCC/CP/1995/7/Add.1 decision 11/CP.1.

and fortifying or establishing early warning systems for extreme weather events. It could also fund implementation of adaptation measures.

Funding criteria are that projects are country-driven, based on national priorities and geared toward sustainable development. A substantial proportion of the pledged USD 410 million will be made available to the Special Climate Change Fund for adaptation activities, although it is likely that ODA contributions will form part of this sum. The fund complements climate change focal area funding under the GEF (see below).

Least Developed Countries Fund

The Least Developed Countries Fund, implemented through the GEF, supports least developed countries in preparing and implementing National Adaptation Programmes of Action (NAPAs). Little more than USD 10 million is made available under the fund for the preparation of NAPAs. Countries can apply for full cost funding of up to USD 200,000. The fund does not yet cover the cost of actual implementation of adaptation measures.

Adaptation Fund

With entry into force of the Kyoto Protocol, this resource became a trust fund under the GEF. It will finance implementation of concrete adaptation projects in non-Annex I countries, including activities aimed at avoiding forest degradation and combating land degradation and desertification. The proportion and type of adaptation projects to be financed have yet to be agreed on. Resources for this fund come from a share of Clean Development Mechanism (CDM) projects—in the order of two per cent of certified emissions reduction revenues—as well as from other sources.

Apart from the three funds mentioned above, the Marrakech Accords (adopted at COP9) include a capacity-building framework (extending earlier capacity-building activities in developing countries) and a technology transfer framework. However, they have no financial mechanisms of their own. Funding for adaptation under the technology transfer framework is considered not to be additional to other sources, but rather should stem from conventional sources, such as development cooperation and PPPs.

Global Environment Facility

Currently, the GEF funds six focal areas, including biodiversity, climate change and land degradation. It has approximately USD 200 million per year to spend on climate change, complemented by some additional funding, such as ODA and loans. The GEF is meeting the full costs of capacity-building and research in relation to adaptation under Stage I activities (see Table 1), using resources from the Special Climate Change Fund. While five Stage II activities have been initiated to date, it is unlikely that any Stage III activities will be funded before 2008. Nonetheless, Strategic Priority Adaptation (SPA) pilots under the GEF started in 2004, which do implement adaptation measures.

The GEF intends to expand its range of activities, including capacity-building and adaptation, in accordance with the provisions of the Marrakech Accords. It could determine priorities through a global analysis of vulnerability and adaptation, as well as by allowing countries to highlight their own concerns (Huq, 2002). The GEF also aims to integrate adaptation into the other focal areas, most notably by looking into topics like biodiversity and integrated resource management (GEF, 2003). Under the SPA, which became operational on 1 July 2004, approximately USD 50 million is available for adaptation pilots ('piloting an operational approach to adaptation'), meaning actual implementation (Stage III) (GEF, 2004). Depending on the size of the project, the GEF will provide funding of 100% (small grants) or less (larger grants).

Non-compliance fund

At COP3 in 1997, the Brazilian government proposed the establishment of a fund financed through the collection of fees from countries in non-compliance with their obligations regarding greenhouse gas emissions reduction under the UNFCCC. All Annex I nations (developed countries) would face the same emissions ceiling (30% reduction by 2020 relative to 1990), proportional to their share of greenhouse gas emissions. The funds would be used for clean development; this inspired the CDM. They could also be used, though, for financing adaptation measures. Such funds based on non-compliance with obligations concerning greenhouse gas emissions reduction, however, would have to be negotiated through the UNFCCC process. Besides scientific difficulties, such as estimating the impact of the emissions of individual countries on the global climate (Rosa et al., 2004), it is likely that direct coupling of non-compliance and payments for adaptation would prove problematic in the negotiation process as this would imply acknowledgement of responsibility for damages.

Disaster relief and risk reduction

On average, USD 4.6 billion was claimed for disaster relief from the members of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development (OECD) between 1999 and 2003, which has mainly consisted of ad hoc raising of funds.[i] Besides claiming resources from donors, natural disasters also have far-reaching consequences for macroeconomic performance, as well as for public finance (Benson and Clay, 2004). There is increasing awareness that reduced vulnerability and increased preparedness are ways forward in terms of diminishing

the long-term impact of natural disasters, while simultaneously decreasing demand for foreign aid and relief and reconstruction resources. In particular, aid organisations, such as the International Federation of the Red Cross and Red Crescent Societies (IFRC), have called for more activities in the field of disaster risk reduction (IFRC, 2002).

Funding of disaster risk reduction now mainly takes the form of ODA and development bank initiatives, as well as efforts at the national government level. Disaster risk reduction reduces vulnerability to climate variability, once risk management strategies are incorporated into development projects; various institutions acknowledge this (see, for example, IFRC, 2002; EC, 2003; Van Aalst and Helmer, 2004; Burton and Van Aalst, 2004; Sperling and Szekely, 2005). Successful disaster risk reduction projects include the Cyclone Preparedness Programme in Bangladesh and the planting of mangroves in the coastal zone of Vietnam, where, for relatively little money, many casualties and major economic ramifications have been avoided.

Public expenditures

Developed countries reserve substantial financial resources for investment in water management and coastal protection, making public expenditures one of the largest potential funds for adaptation. Additionally, they set aside resources to cover the costs of natural disasters (pooling). Developing countries, however, are unlikely to hold back additional funds for climate change adaptation. Moreover, there is a diverging trend between incomes in developed and developing nations (World Bank, 2001), making any self-sufficiency effort in developing countries increasingly difficult. Nonetheless, it is likely that many low-cost options exist to mainstream adaptation in government planning processes and expenditures. Within the climate change negotiations, some developing countries expect to receive funds to cover the full cost of adaptation, but this is unlikely to happen. UNFCCC funds, therefore, may be required, although the bulk of financing will have to come from additional sources.

Activities based on public expenditures can be complemented by efforts within PPPs. PPPs are partnerships between public institutions, private companies and non-governmental organisations (NGOs), which have the potential to strengthen public (sustainable development) goals by harnessing private efficiency and resources. If funds for PPPs are partly derived from development bank loans, regulations can be set with respect to the characteristics and objectives of PPP efforts. However, most research on PPPs is limited to activities that reduce greenhouse gas emissions; options for adaptation efforts still need to be explored.

Insurance and pooling

Most financial policies tend to be reactive in character, taking the form of relief aid and rehabilitation and reconstruction loans. There are some exceptions, though, with financial policies being put in place before a disaster strikes. Stage III adaptation activities make explicit reference to insurance as an adaptation measure. The IPCC's *Third Assessment Report* discusses both the challenges facing the financial services sector (insurance and banking) as a result of climate change, as well as the opportunities for

both the sector and society as a whole to benefit from insurance and related products, by using them as a proactive vehicle to cover losses due to extreme weather events (Vellinga et al., 2001).

First of all, financial services can help with absorbing part of the losses due to (weather-related) natural disasters, thereby lessening the need for disaster relief. Second, these services can help in reducing vulnerability by setting standards for buildings and land-use planning, inter alia (Hoff, Warner and Bouwer, 2005). Recent studies also underscore the potential for sectors in developing countries, such as the water sector, to take steps to incorporate financial services products into development projects (Bouwer and Vellinga, 2005; Hoff et al., 2003). Fox (2003), for instance, proposes the promotion of insurance schemes through development banking to reduce the impacts of flooding. Additionally, micro-credits and micro-insurance, often provided by local and small-scale institutions, could complement more conventional financial market products. This is particularly true for the agricultural sector, where micro-credits and crop insurance can help to diversify income and create greater resilience. The links between natural disaster risks and micro-finance instruments, however, need to be explored further (see, for example, Miamidian et al., 2005). Moreover, insurance may often simply be too expensive for many people.

Risk management and coverage of disaster losses are also an issue for developed countries. The meeting of natural disaster costs in Europe, for instance, could occur at the European level. The European Commission has proposed, therefore, an EU-wide pooling mechanism to deal with disaster losses: the European Union Solidarity Fund (EC, 2002). This instrument was established in response to the widespread flooding of Central Europe in 2002, in order to allow the EU to respond efficiently to catastrophe losses due to extreme weather events. This type of disaster pooling is specifically a task of governments.

Development assistance

The multi-agency paper on poverty and climate change (ADB et al., 2003) points out that climate change adaptation objectives can be incorporated into development activities funded through ODA. According to Klein (2001), the long-term effects of climate change on ODA are connected in at least three ways. First, climate change poses a threat to projects that involve ODA. Second, the community or ecosystem that benefits from ODA may be vulnerable to climate change. Third, the ODA project may have (positive or negative) effects on the vulnerability of the community or ecosystem to climate change.

Risk assessments, vulnerability assessments and environmental impact assessments as part of ODA-funded projects could help to reduce the vulnerability of these projects to climate change. Globally, however, the amount of development assistance is decreasing, making ODA an increasingly limited funding source for adaptation. In addition, some part of ODA takes the form of loans, adding to national debt. Donor governments have frequently focused on multiple interests in development assistance, including their own economic and political goals, which have not always been consistent with the sustainable development objectives of host countries.

The European Commission has identified adaptation as a relevant response strategy in development cooperation for most EU partner nations, using a set of indicators. Most of the proposed assistance, though, is limited to capacity-building (such as joint research and knowledge exchange), and does not include the provision of funds for the implementation of adaptation (EC, 2003). This leaves few possibilities for the funding of actual adaptation measures. Some scientists recognise that ODA can be better used to address the fundamental determinants of development and poverty instead of as a source of investment in environmentally sound and cleaner technologies (Radka et al., 2000) and climate change adaptation. This also implies that ODA should not be employed explicitly for adaptation or greenhouse gas emissions reduction efforts. Within ODA, however, adaptation could be mainstreamed. The most important objective in this respect would be that long-term goals with regard to risk management and climate change should be taken into account as well, besides development and poverty reduction priorities. Additional financing of adaptation costs related to ODA projects could come from UNFCCC funds.

Foreign direct investment

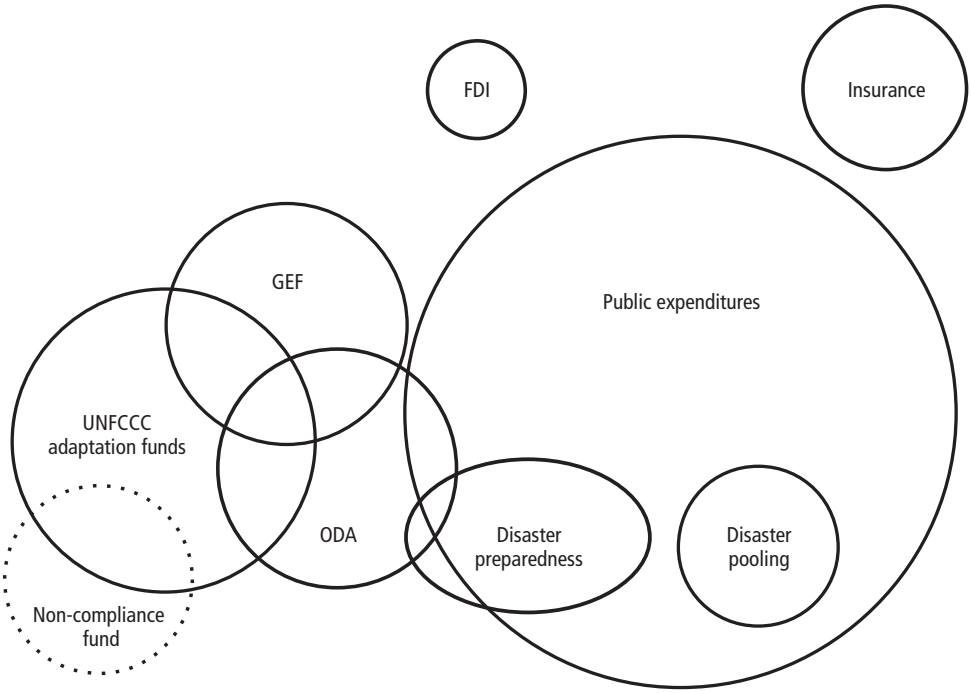
FDI flows are potentially important for adaptation. One reason is that the amount of FDI in many countries is some orders of magnitude larger than the quantity of funds available for ODA. In 2001, the global level of ODA was USD 52.3 billion, while, on average, global FDI amounted to USD 207.6 billion between 1998 and 2002. Ways could be found to influence investments and make them relevant to adaptation, most notably through national policy. For instance, climate risk can be reduced if building codes and land-use regulations for real estate, including hotel resorts in the coastal zone, are applied. An increasingly attractive scenario for investors would be if small subsidies, provided through loans from development banks, for example, complemented such regulations, compensating for the extra investment costs.

Evaluation of funding options

In the previous sections, we have presented options for the funding of adaptation. Figure 1 illustrates the relationship between some of the major funds and their potential importance for adaptation activities. The size of the circles roughly indicates their relative potential importance for adaptation activities, based on the above discussion of the different sources. The relative importance varies from country to country, and is currently highly uncertain. Additional funds could come from the private sector and the household as well as through local community spending.

Although it is clear from Figure 1 that there are many sources, the potential for financing adaptation activities using all of the funds is more limited, as many of them are related and overlap. For example, ODA and GEF funds intersect with UNFCCC funds, especially when developed countries consider their UNFCCC contribution to be ODA. Other (non-climate) funds within the GEF, such as those for the 1992 Convention on Biological Diversity (CBD) and the 1996 United Nations Convention to Combat

Figure 1 Relationship between different potential sources of funds for adaptation in developing countries at the national level



Desertification (CCD), could potentially contribute to adaptation, but probably only to a limited extent (where synergies with the aims of other multilateral environmental agreement exist) (see, for instance, Bergkamp and Orlando, 1999). FDI, as discussed earlier, is a major source, but the probability of influencing adaptation aspects will remain low as long as the national policies of recipient countries do not make disaster risk management or climate adaptation a prerequisite for FDI. Public finance can be considered as the most important source for funding physical adaptation measures in most developing countries, as currently, government budgets cover most of the investments, such as in general infrastructure. Pooling for disasters and ex-post financing of disaster losses is part of public expenditures. Lastly, insurance has some potential to cover disaster losses, and may lead to disaster reduction. Insurance, though, will not fund any physical adaptation measures.

With regard to least developed countries, UNFCCC adaptation funds could support a considerable proportion of adaptation measures, if simplified rules were put in place that would, for instance, allow full funding of projects (see the discussion in the final section). For more developed countries, however, these funds are likely to be more limited.

In the following two sub-sections, we briefly evaluate the policy options for funding adaptation and their interrelationships. Most importantly, we distinguish between a

situation in which funding of adaptation is shaped under a new (post-2012) climate agreement, and one in which adaptation is incorporated into other planning processes (mainstreaming).

Funding of adaptation under the UNFCCC

There are a number of difficulties associated with funding adaptation under the current UNFCCC. First, it is important to understand the existing state of adaptation policy and funding. Under the UNFCCC, there are presently no legally binding quantitative obligations to finance adaptation. Funds comprise voluntary contributions. Second, there is the difficulty of distinguishing between adaptation costs that arise from efforts to reduce impacts due to anthropogenic-induced climate change ('incremental costs') and those from initiatives to lessen the effects of natural climate variability. A particular aspect is the difficulty of distinguishing between local causes of impacts (regional climate variability, socio-economic changes, land-use changes) and global causes (climate change caused by anthropogenic greenhouse gas emissions). The UNFCCC agrees to cover the full incremental costs, or the costs that lead to global environmental benefits, but not those that result in local benefits, which is particularly the case for adaptation. Capacity-building efforts and activities in relation to National Communications under the UNFCCC are eligible for full funding.

The UNFCCC and the Kyoto Protocol/Marrakech Accords have provided a number of opportunities to carry out vulnerability and adaptation assessments under Stage I and Stage II activities. However, the difficulty of assessing the incremental costs of projects due to climate change is likely to remain a very important obstacle for Stage III activities (implementation of adaptation measures). Some openings for partial and full cost funding of actual implementation exist under the SPA of the GEF. It appears that the best way forward is to use UNFCCC funds to lever adaptation projects, meeting costs in full or in part depending on the country and the size and nature of the project.

There are some reasons why funding of adaptation should remain a central topic in a multilateral agreement. First, binding obligations on the part of states parties to fund adaptation could prove to be crucial in maintaining commitment and keeping the pressure on parties to invest effort in reducing greenhouse gas emissions. Second, to prevent developed countries from regarding their contribution to general ODA as adaptation funding, commitment to adaptation is needed under a multilateral agreement. Third, commitment in the form of more substantial funding of adaptation is needed to preserve faith in the UNFCCC. These arguments, though, will only hold true after a legally binding and substantial contribution to adaptation has been negotiated under the convention.

Mainstreaming climate change adaptation

Mainstreaming adaptation refers to the integration of adaptation policy and measures into ongoing (national) sectoral planning and decision-making processes. This is already happening to a large extent in developed countries in relation to current climate variability and weather extremes. In developing countries, this is often not the case, and

many cheap and simple opportunities to reduce vulnerability may be available. Efforts made to mainstream adaptation to climate change have proven relatively fruitful in the agricultural sector, which has a long history of working on drought-prone areas, inter alia, while in other sectors, such as water resources, and at the national policy-making and planning level, they have not been as successful (Huq et al., 2003).

Mainstreaming seems sensible, since climate change adaptation measures are often difficult to separate from other issues in different sectors, including agriculture and water, especially with respect to natural hazards and current climate variability. Current policies for climate risk management, if in existence, tend to be divided among these sectors. Adaptation policies, therefore, could best be implemented in these sectors, instead of establishing new institutions. In these sectors, knowledge and capacity could be increased. Mainstreaming of adaptation policy is also increasingly recognised, for instance with regard to planning in international financial institutions, like the World Bank, where proactive management of natural disasters and climate change is gaining more attention (Burton and Van Aalst, 2004; Sperling and Szekely, 2005).

One way of mainstreaming adaptation is to develop a risk management approach, within which climate risk assessments would become part of activities in development work, for example. Such climate risk assessments should focus on climate change, climate variability and extreme weather events (Burton and Van Aalst, 2004). National climate risk management can be integrated into existing (sectoral) risk management practices. International organisations, such as the International Strategy for Disaster Reduction and the ProVention Consortium, as well as NGOs and risk-related private companies, can aid implementation of risk management at the national and local level.

A central question is whether mainstreaming of risk management in other planning and development processes amounts to the most efficient use of limited financial means by these development processes. It appears, though, that opportunities costing little or nothing allow for the inclusion of adaptation objectives in development processes. Evaluations of the benefits of risk reduction need to be conducted to highlight the advantages of, and to justify investments in, the integration of risk management approaches into development processes. Tools for these assessments are available (see, for instance, Benson and Twigg, 2004). Although the local benefits of individual risk reduction projects have been shown, the macroeconomic advantages of a risk management approach throughout different sectors (systems approach) are unknown.

In developing countries, NGOs play a key role in developing adaptation measures at the community level (where most impacts are expected). Research has shown that many NGOs claim to be prepared for the potential threats posed by climate change. They are, however, unaware of the latest scientific developments. Hence, mainstreaming adaptation in the daily practices of NGOs requires the building of capacity in relation to scientific knowledge and better communication with regional constituencies. Another aspect concerns access by NGOs to adaptation funds. Current funding mechanisms require an official government application. Although NGOs try to work closely with the government, communication is suboptimal in many instances. Moreover, fund-raising by an NGO through the government would severely threaten its independent status and thus its ability to work effectively with communities (Rojas, 2004).

Discussion and conclusions

There is currently no commitment on the part of Annex I countries to provide funding for meeting incremental costs, let alone the full adaptation costs of Annex II countries. Current funds under the UNFCCC are very limited, when compared to the expected costs of the assessment of vulnerability and adaptation, and planning and implementation of adaptation measures. A clear funding commitment under the convention could improve this situation—for example, a fixed percentage of gross domestic product (GDP) for Annex I countries. The benefits of adaptation for both Annex I and Annex II states could be made more explicit, in order to increase the commitment to funding. Such advantages for Annex I nations could include return flows of adaptation contributions, through research, expertise and construction contracts. The benefits of adaptation for Annex II countries, including reduced vulnerability and impacts, could be clarified through risk management studies.

Since the UNFCCC will only meet incremental costs, basic funding will have to come from other sources, mostly development banks, other conventions, ODA and domestic savings. Another option is to define simplified funding rules for meeting part or all of the adaptation costs in developing countries (Gupta and Dorland, 2003) and to make sure that the measures being funded also have other environmental benefits (Huq, 2003). This could lead to links with other conventions and funds operated by the GEF. It could be opportune for developing countries to agree on partial funding only, rather than using complicated incremental cost calculations. Setting criteria would help to limit interest in these finite funds. Vulnerability and adaptation studies would provide a basis for determining priorities. Some practical experience in the use of simplified rules can be gained from pilots that have recently started under the SPA of the GEF. Simplified rules for incremental costs and the paying of less attention to the issue of global environmental benefits would speed up the implementation process. Still, substantial commitment to fund adaptation measures by Annex I countries would be needed if funding adaptation under the UNFCCC were to cover a substantial part of the costs. But mainstreaming climate change in other development processes and risk management is still required, as the funds needed for adaptation are likely to be vast.

Capacity-building is already (partly) covered under UNFCCC Stage I and II activities and other bilateral programmes, such as the US Country Studies Program and the Netherlands Climate Assistance Programme. This is appropriate for the national policy-making level, but improving awareness and capacity at the planning and local level would require considerably more effort. It appears logical therefore to integrate awareness of vulnerability and adaptation into development projects and ODA. A major challenge is to increase the level of awareness of the necessity to incorporate climate change adaptation into development in the medium and long term. While this can be achieved through broad implementation of frameworks that promote adaptation, including the Adaptation Policy Framework (Lim, Burton and Huq, 2004), it can be accomplished foremost by involving policymakers from ministries besides those of the environment and water resources, such as the departments of economic affairs, energy, finance, industry and trade, in UNFCCC negotiations and communication on adaptation.

Mainstreaming climate change adaptation in other development processes is likely to provide many opportunities. Climate adaptation should not be seen as an environmental problem but as a general risk management issue that affects all policy areas (agriculture, coastal protection, energy, finance, industry, trade and water resources). The importance of these policy areas should be highlighted and communicated. Such 'climate-proofing' of development projects that currently do not consider climate and weather risks could improve their sustainability. Linking these efforts with risk management practices in national sectors as well as multilateral donor institutions appears viable, since the subject of reducing (weather-related) natural disasters is gaining attention. Capacity-building in relation to integrated climate risk management can be improved through conventional programmes, such as those of the IFRC, the United Nations Development Programme (UNDP) and the World Bank. This can be achieved by linking up with Integrated River Basin Management and Integrated Coastal Zone Management and associated national and multilateral institutions, including development agencies, NGOs and the United Nations International Strategy for Disaster Reduction.

Some institutions in the area of disaster reduction and relief, such as the IFRC, already see climate change as an issue that affects their work. Financing disaster risk reduction from UNFCCC funds could be an option in the short term, to satisfy the most urgent of needs. This would go beyond merely meeting incremental costs. When funds are limited, attention could be concentrated on hot spots. Financing disaster risk reduction could also result in savings in disaster relief expenditure. Finally, the introduction of financial products, such as cat bonds, disaster pooling (public, private), insurance and micro-credits, can absorb part of the losses due to weather extremes. The financial services sector can also contribute to the building of capacity in relation to risk management, risk awareness and the implementation of standards for disaster risk reduction.

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Endnotes

[1] See http://www.oecd.org/dac/stats. These numbers also include aid provided in response to conflicts, accounting for a considerable share.

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