

Adaptation to Climate Change

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6.1 Introduction

This chapter examines the status of international discussions on adaptation to climate change and reviews various proposals to strengthen the focus on adaptation for a post-2012 climate regime. After examining the perspectives of stakeholders from both developed and developing countries, a few priorities to move forward are identified.

6.1.1 Meaning and nature of adaptation

The term “adaptation” is now widely used in international climate change agenda, but various stakeholders define and interpret it quite differently. The IPCC for example, refers to adaptation as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC 2001b). IPCC distinguishes various types of adaptation according to intention and time of action, and type of actors involved, such as autonomous versus planned adaptation, anticipatory versus reactive adaptation, and public versus private adaptation. Thus, the IPCC provides a broad definition of adaptation that focuses not only on technical measures but also on institutional responses to facilitate adaptation of both natural ecosystems and human beings. The UNFCCC, on the other hand, interprets adaptation as “practical steps to protect countries and communities from the likely disruption and damage that will result from effects of climate change” (UNFCCC 2006a). The convention emphasises the steps to address human-induced climate change, although in most cases it is difficult to discern whether a particular climate impact results from anthropogenic causes or natural variability. The UNDP defines it as “a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented” (UNDP 2006).

The differences in the above definitions of “adaptation” may seem small but different stakeholders interpret them to suit their own interests, leading to widespread confusion. For example, community-based adaptation practitioners use a more technical interpretation of the term that focuses on actions, while adaptation policymakers use a broader definition and emphasise the institutional and policy sides of adaptation including building knowledge in support of policies and programmes, technologies, financing, capacity building and other institutional arrangements. International negotiators face the dilemma of differentiating adaptation to long-term climate change from adaptation to short-term climate variability, as the convention intends to support primarily those activities falling under the first category. Since such varied interpretations obviously have serious financial implications, it is important to promote a common understanding among the various stakeholders.

Like mitigation, adaptation to climate change is a dynamic and multi-dimensional process (Figure 6.1) as it integrates components such as sound planning, research, technologies, funding, training, capacity building, public awareness, and education (Hay et al. 2004). In order to address adaptation comprehensively, climate risks at local, national or regional levels must be assessed first using different decision support tools (involving data, information, knowledge, understanding, skills, methods and tools).

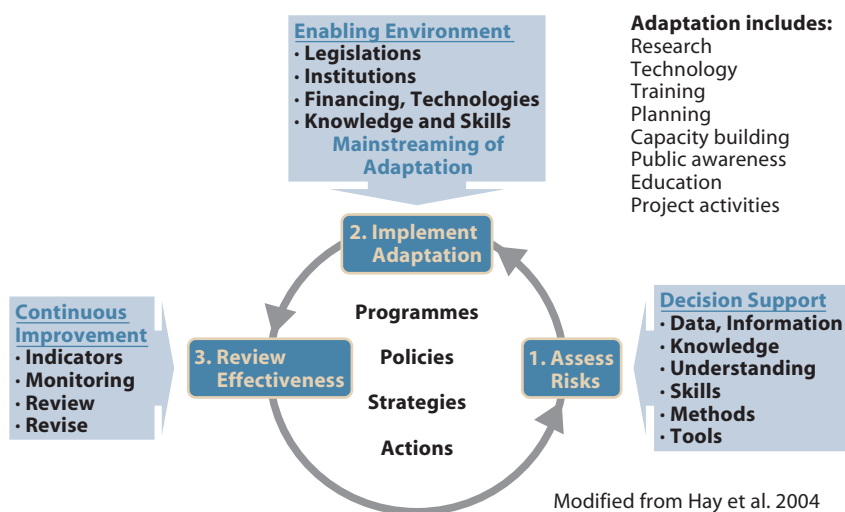
The term “adaptation” is defined and interpreted in many ways, each with different financial implications.

Adaptation to climate change is a dynamic and multi-dimensional process.

For proper implementation of various programmes, policies, strategies and actions on adaptation, however, we need a good enabling environment, which includes legislations and institutions that can support mainstreaming of adaptation concerns in development planning. Effective implementation of adaptation actions, therefore, requires more than the mere output of climate data. Furthermore, we need to determine the effectiveness of the implemented adaptation activities through the development of reliable indicators and then revise the existing practices, if necessary. Successful adaptation to climate change, therefore, requires flexible institutional and policy processes, increased public awareness and dialogue, sharing of knowledge on adaptation measures, mobilisation of tools and technologies, capacity building, and appropriate monitoring and evaluation (Cosbey et al. 2005a).

Effective implementation of adaptation actions requires more than the mere output of climate data.

Figure 6.1 Multi-dimensions of adaptation process



6.1.2 Emergence of adaptation as a policy priority at the international level

International climate discussions to date emphasised mitigation as a policy response to address climate change. However, with the publication of the Third Assessment Report of the IPCC in 2001, which emphasised that climate change impacts are already becoming evident in many economic sectors and ecosystems, the focus on adaptation as a policy priority has increased. The discussions gained further momentum in 2002 at COP8, which adopted the Delhi Declaration on Climate Change and Sustainable Development. Interestingly, the emergence of adaptation as a complementary strategy to mitigation coincided with the time when the USA decided to withdraw from the Kyoto Protocol. The Buenos Aires programme of work on adaptation and response measures adopted at COP10 in Argentina and the decision to develop a five-year programme of work for the SBSTA on the scientific, technical and socio-economic aspects of impacts, vulnerability and adaptation to climate change have again reiterated the importance of adaptation.

Simultaneously, the increasing numbers of scientific reports suggesting the rise in GHG concentrations and global mean temperature, and associated impacts of climate change (e.g. Arctic Climate Impact Assessment [ACIA 2004]) have also contributed to alert the policy community to strengthen strategies on adaptation. For instance, atmospheric concentrations of CO₂ reached a record high of 379 ppm at Mauna Loa in March 2004, and the 11 warmest years in the past 125 years have occurred since 1990, with 2005

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being the warmest year on record (GISS/NASA 2006). It is now accepted that even the most stringent mitigation efforts cannot avoid severe impacts of climate change in the next few decades. The design and implementation of adaptation measures to address the needs of vulnerable countries has thus become more and more pressing, and this represents a key challenge for the UNFCCC (Mace 2005).

6.1.3 Adaptation concerns and challenges in the Asia-Pacific region

Our previous consultations held in 2005 indicated that the impacts of climate change in the form of increasing frequency of droughts and floods, and sea level rise are already evident in many parts of Asia, adversely affecting the productivity of ecosystems and livelihoods (IGES 2005a). Projections on future impacts of climate change in the region suggest serious impacts. For example, a 40-cm sea level rise by 2080 could displace as many as 55 million people in South Asia, and 21 million people in Southeast Asia as opposed to only 3 million in rest of the world, excluding Africa (IPCC 2001b). The severe adverse impacts of climate change on agriculture and water sectors make large populations across Asia particularly vulnerable. IGES consultations revealed that the lack of policy relevant scientific information and shortage of funding to address adaptation were major bottlenecks to facilitate adaptation in Asian countries.

Other concerns expressed by Asian policy makers include the failure to integrate adaptation concerns in development planning, inadequate capacity to assess local impacts, and the lack of appropriate adaptation technologies. Participants noted serious concerns on financing of adaptation, including (a) extremely limited funding, (b) inadequacy of 2% share of CDM proceeds to meet adaptation demands, (c) lack of clear guidelines, and complex procedures for utilising adaptation funds, (d) doubts on utility of market mechanisms for facilitating adaptation, and (e) immaturity of insurance markets in Asian developing countries. Some challenges for facilitating adaptation to climate change in the Asia-Pacific region at local, national and regional levels, as identified in our consultations, are listed below:

Regional and international:

- Developing international consensus on the scope of adaptation and means to enhance the availability of, and access to adaptation funds
- Identifying and building on inter-linkages (scientific, implementation and reporting linkages) of various communications
- Supporting Clearing House mechanisms specifically for the UNFCCC and the Kyoto Protocol at both regional and international levels
- Building synergies among subsidiary bodies of CBD, CCD and UNFCCC
- Awareness raising, education and public participation

National:

- Mainstreaming climate change in national and sector development planning, through changes in policies and institutions, including technology deployment
- Strengthening capacity of national institutions to seek complementarities among the environment and development frameworks through linkages with national communications and NAPAs, with PRSPs and MDGs
- Prioritising short-, medium-, and long-term adaptation actions which have a direct bearing on the livelihoods of vulnerable communities

A survey of national communications of Asian countries to the UNFCCC revealed that most of the countries have paid scant attention to adaptation policies and measures.

- Involving the private sector in adaptation activities through providing necessary incentives such as tax holidays
- Integrating alternative livelihood strategies for extreme climatic events through national disaster management plans, including dissemination of seasonal climate forecasts

Local:

- Identification of strategies for facilitating proactive micro-adaptation with the participation of the local communities and local governments
- Exchange of “best practice guidelines” and lessons learnt at the local level

The integrated assessments of adaptation-related challenges in Asia suggest that many countries lack the adaptive capacity to cope with future impacts (IGES 2005a). In most countries, even if vulnerable areas and communities are identified and suitable plans are established, financial resources for implementing such plans are extremely limited. Despite such challenges, a survey of national communications of Asian countries to the UNFCCC revealed that most of the countries have paid scant attention to adaptation policies and measures and that the discussion was largely confined to biophysical impacts (Table 6.1). Such lack of attention to adaptation strategies in national communications underscores the need for substantial progress in this area.

Table 6.1 Coverage on adaptation policies and measures as reflected by number of pages in National Communications of selected Asian countries

Country	Total number of pages	No. of pages describing impacts and vulnerability	No. of pages discussing adaptation policies
Bhutan	63	10	2
Cambodia	79	8	2
China (NC1)	112	13	4
India	292	48	8
Indonesia	116	10	3
Japan (NC4)	314	11	0.5
Lao PDR	97	2 lines	1 line
Malaysia	131	30	7
Maldives	134	30	10
Mongolia (NC1)	106	18	7
Nepal	181	41	10
Pakistan	92	14	9
Papua New Guinea	83	20	6
Republic of Korea (NC2)	132	8	2
Singapore	75	5	1 line
Sri Lanka	122	12	5
Thailand	100	15	2.5
The Philippines	107	20	12
Viet Nam	135	17	4

Source: UNFCCC, 2006g

Several participants in IGES consultations noted that the current climate regime failed to facilitate the transfer of adaptation technologies. Since the uptake of adaptation technologies is dependent on the buy-in and involvement of an expanded stakeholder community, and there is unwillingness at present to provide the funding required to

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transfer these technologies, technologies for adaptation face additional barriers when compared to mitigation technologies (Klein et al. 2006).

Many participants identified the lack of capacity of several Asian developing countries for developing constructive negotiation strategies on adaptation issues as a major barrier. Gupta (1997) reported that developing countries often tend to adopt defensive or “non-realist” strategies which focus more on the issues rather than interests, and mainly consist of pre-defined positions based on equity arguments and the north-south divide. The small size of delegations without any representatives to negotiate on adaptation issues, lack of negotiating experience, lack of back-up support by NGOs and academia, and low political priority at home also contribute to this problem (Richards 2001).

6.2 Adaptation in the current climate regime

6.2.1 Evolving focus on adaptation

As mentioned in section 6.1.2, the focus on adaptation in international discussions is gradually evolving. The climate change convention of 1992, for example, refers to the terms *adaptation*, *adverse impacts*, and *vulnerability* at least 20 times. Article 7 (COP), Article 9 (SBSTA) and Article 10 (SBI) also refer to adverse impacts of climate change implicitly. Article 3 (Principles), Article 4 (Commitments) and Article 11 (Financial mechanism) of the UNFCCC, and Article 10 (Reporting) and Article 12.8 (CDM proceeds to support adaptation) of the Kyoto Protocol refer to adaptation and adverse impacts of climate change. Article 2 refers to the goal of stabilising GHG concentrations at a level to be achieved within an adequate timeframe that allows ecosystems to adapt naturally to climate change. The goal may also be interpreted to mean that mitigation efforts have to be strong enough to keep climate change impacts within the realm of adaptive capacity, so as not to endanger food production and sustainable economic growth. Further, Article 3.1 of the UNFCCC asks developed countries to take the lead in combating the adverse impacts of climate change.

Most of the substantive obligations for all parties on adaptation to climate change appear in Article 4 of the UNFCCC (Verheyen 2002). Article 4.1 (b), (e) and (f), for example, stipulate commitments for all countries in terms of formulating, cooperating and considering the impacts of climate change in social, economic and environmental policies and actions. Parts g, h and j also require Parties to cooperate, exchange and communicate information related to implementation. Articles 4.3, 4.4, 4.5, 4.7, 4.8 and 4.9 address funding to assist developing countries in meeting various commitments of Article 4.1 (Mace 2005). Article 4.3 further refers to provision of “new and additional” funding to meet the full costs of national communications obligations of developing countries, and “incremental costs” of implementing adaptation measures. Article 4.4 refers to support for developing countries that are particularly vulnerable to climate change but does not refer to the incremental cost provision. Article 4.5 refers to support for technologies (including those for adaptation) while Article 4.7 acknowledges that the extent to which developing countries will effectively meet their commitments will depend on the effective implementation by developed country parties of their own commitments on finance and technology transfer. Article 4.8 refers to support for SIDS, countries with low-lying coastal areas, countries prone to natural disasters, drought and desertification, and so on, while Article 4.9 refers to supporting the LDCs. Article 12.3

requires developed parties to incorporate details of measures taken under Articles 4.3, 4.4 and 4.5 in their national communications. Article 21 of the UNFCCC and Decision 3/CP.4 confirmed that the GEF serves as the financial mechanism of the convention for both mitigation and adaptation. The creation of the Special Climate Change Fund (SCCF) and LDC Fund (LDCF) under the convention, and Adaptation Fund (AF) under the Kyoto Protocol through a series of related decisions at COP7 further increased the focus on adaptation. Decision 5/CP.7, for example, identified 18 areas of assistance on adaptation while Decision 28/CP.7 defined the process of development of National Adaptation Programmes of Action (NAPAs) in LDCs.

Adaptation gained further attention in 2004 at COP10, which adopted the Buenos Aires Programme of Work on Adaptation and Response Measures (Decision 1/CP.10). The programme included further scientific assessments of vulnerabilities and options for adaptation, support of the NAPAs of LDCs, new workshops and technical papers on climate change risk and adaptation, and support for mainstreaming adaptation into sustainable development planning. Later at COP11 in Montreal in 2005, a detailed five-year programme of work on impacts, vulnerability and adaptation to climate change that will assist Parties to make informed decisions on implementation of adaptation measures was adopted, through Decision 2/CP.11.

Simultaneously, international donor organisations have realised that their activities can both be affected by climate change impacts and influence capacities to cope with the impacts. The 2003 report of members of the Vulnerability and Adaptation Research Group (VARG) *Poverty and Climate Change* makes the case for integrating adaptation concerns into development programming (AfDB et al. 2003). The Asian Development Bank published a report on mainstreaming adaptation concerns in ADB Project operations (ADB 2003).

6.2.2 A comparison of the mitigation and adaptation regimes under the UNFCCC

Adaptation is much less developed than mitigation as an international policy response in several ways. Based on a comparative assessment, Burton and May (2004) noted that mitigation was clearly defined in the convention with explicit objectives, standard measures and baseline (1990 emissions) while adaptation was not clearly defined, no specific objectives were stated and no standard measures or baselines were given. They also reported that global environmental benefits and incremental costs were easier to estimate in mitigation projects than in adaptation actions. For mitigation, financial arrangements are clearly defined along with a legally binding instrument “Kyoto Protocol”, while funding for adaptation is multiple, inconsistent and inadequate, without any legal instrument.

6.2.3 Adaptation financing – Status and challenges

Based on recent World Bank estimates and the figures provided in NAPAs by the LDCs, Müller and Hepburn (2006) indicated that the cost of adaptation in the developing world will be in the tens of billions of Euros annually. Meeting such costs through international negotiations is a huge challenge. Moreover, the scope of adaptation to determine if it includes adaptation to natural disasters is not yet decided. The creation of a system to ensure that resources are contributed to various funds also remains a serious challenge (Bouwer et al. 2004).

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Currently, besides the Strategic Priority on Adaptation of the GEF Trust fund, two special funds under the convention (SCCF, LDCF) and one fund under the Kyoto Protocol (AF) are approved to support adaptation efforts (Table 6.2). Huq (2004) provided a detailed architecture for adaptation funding at the international level focusing on funding sources, actors involved and activities supported. The status of and challenges for the various funds are briefly discussed below.

Table 6.2 Status of financing provisions for adaptation under the current climate regime

Name of the Fund	Funding source	Total funds mobilised (US\$)	Legal basis for funding (COP and GEF decisions)	Operational criteria	Main activities of support	Remarks
I. Funds established under the Convention (Articles 4.1, 4.3, 4.4, 4.5, 4.8, and 4.9)						
(a) Global Environment Facility (GEF) Trust Fund	GEF		UNFCCC Article 4.3 1/CP.11, 5/CP.7 GEF/C.23/Inf.8	• Incremental cost to achieve global environmental benefits	• Vulnerability and adaptation assessments as part of national communications and enabling activities	
(b) Strategic Priority on Adaptation (SPA)	GEF	50 million	6/CP.7 GEF/C.23/Inf.8	• Incremental cost guidance with some flexibility, especially for Small Grants Programme	• Pilot and demonstration projects on adaptation • Small Grants Programme (\$5 M) to support community-based adaptation	
(c) Special Climate Change Fund (SCCF)	Voluntary contributions from 11 developed countries (Canada, Denmark, Finland, Germany, Ireland, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom)	45.4 million (Contributions: 36.7 M Pledged: 8.7 M)	5/CP.7, 7/CP.7, 5/CP.9 GEF/C.24/ 12; GEF/C.25/ 4/Rev.1	• Additional cost of adaptation measures • Sliding scale for co-financing	• Addresses adaptation as one of the four funding priorities	GEF allocation of 2.0 M was used for projects and administrative support.
(d) Least Developed Countries Fund (LDC Fund)	Voluntary contributions from 13 developed countries (Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden, and Switzerland as of 30 April 2006)	75.7 million (Previous contributions: 29.9 M Pledged: 45.8 M GEF allocation to date: 11.8 M)	5/CP.7, 7/CP.7, 27/CP.7, 28/CP.7, 29/CP.7, 6/CP.9 3/CP.11, 4/CP.11 GEF C/24/Inf.7; GEF/C.24/Inf.8/ Rev.1; GEF/C.25/ 4/Rev.1	• Guiding principles: country-driven approach, equitable access by LDCs, expedited support and prioritisation of activities • Provision of full cost funding for adaptation increment as identified and prioritised in NAPAs • Sliding scale for co-financing	• Implementation of NAPAs (all projects for the preparation of NAPAs in 44 countries approved with a budget of US\$ 9.6 M)	GEF allocation of US\$ 11.8 M to LDCF was approved for projects, administrative budgets & special initiatives
II. Fund established under the Kyoto Protocol (Article 4.10)						
(a) Adaptation Fund	2% Share of proceeds from CDM	Not yet operational	5/CP.7, 10/CP.7, 17/CP.7 28/CMP1	• Guiding principles: country-driven and a "learning-by-doing" approach, sound financial management & transparency, separation from other funding sources	• Concrete adaptation projects & programmes identified in decision 5/CP.7	

Source: GEF/C.28/4/Rev.1, 19 May 2006

GEF Trust Funds and Strategic Priority on Adaptation: Since the inception of GEF in 1991, cumulative resources made available for GEF Council allocation amounted to US\$ 6.62 billion as of 31 May, 2005. For example, GEF estimated that resources available for Council allocation on 30 June, 2006 were US\$ 547.4 million (GEF 2006). Of the six focal areas of GEF, climate change area receives about one-third of total funds to support four operational programmes, with the most emphasis on mitigation. For example, of the total financing of US\$ 527 million for entire climate change operations in GEF's third replenishment (GEF-3), only US\$ 50 million was allocated to support adaptation through its strategic priority on adaptation. Of this, about US\$ 5 million was allocated to support community-based adaptation in about 10 countries including three in the Asia-Pacific region – Bangladesh, Viet Nam and Samoa.

Participants of our consultations noted that many Asian countries failed to benefit from GEF funds for adaptation because of GEF's slow disbursement process (due to its relatively complex procedures), preference for larger projects and difficulties in determining incremental costs and global environmental benefits. As most adaptation projects are site-specific and have only local benefits, proving global environmental benefits is not an easy task. Further, as many adaptation activities are intimately connected to other aspects of development, such as water management, desertification prevention and disaster preparedness, calculation of incremental costs can be difficult (Cosbey et al. 2005a). Therefore, most GEF Trust Fund resources for adaptation were provided only in the context of the preparation of national communications. In view of such experiences, participants consistently sought for improving flexibility of GEF guidelines. However, Corfee-Morlot et al. (2002) noted that it is unrealistic to expect the GEF to cover the full cost of adaptation projects, as it would require billions of dollars and would quickly exhaust the resources of GEF.

LDC Fund: The LDC fund, which is enabled through voluntary contributions by 13 developed countries (as of April 2006), supports NAPAs of LDCs. So far, US\$ 9.6 million has been approved for undertaking 44 national NAPAs and two global support projects. Among LDCs in the Asia-Pacific, Bangladesh, Bhutan and Samoa submitted NAPAs, while Cambodia submitted an advanced draft. The Myanmar NAPA is under discussion; and Nepal had yet to prepare a NAPA. The limited guidance available for LDCs to access the funds, especially in terms of defining the "additional costs" and "co-financing", and the limited amount available to support adaptation activities under this fund are the two main challenges. COP11 (Decision 3/CP11) gave initial guidance on the operation of the LDC fund through provision of full-cost funding for adaptation increment as identified and prioritised in the NAPAs.

SCCF: This fund, which is also based on voluntary contributions from 11 donor countries, addresses adaptation as one of four priorities. As of 30 April, 2006, 7 projects have entered the pipeline, including one in India (*Climate-resilience Development and Adaptation*) and the Pacific region (*Pacific Islands Adaptation to Climate Change Project*). The tension among developing countries in prioritising activities supported by the SCCF, and the tension between developed and developing countries regarding the full-cost funding of adaptation activities remain major challenges for this fund. While AOSIS and LDCs push for utilising the SCCF for adaptation, OPEC countries would like to use these funds for economic diversification, and the other developing countries prefer to use them for technology transfer and mitigation efforts. This is an aspect where Asian

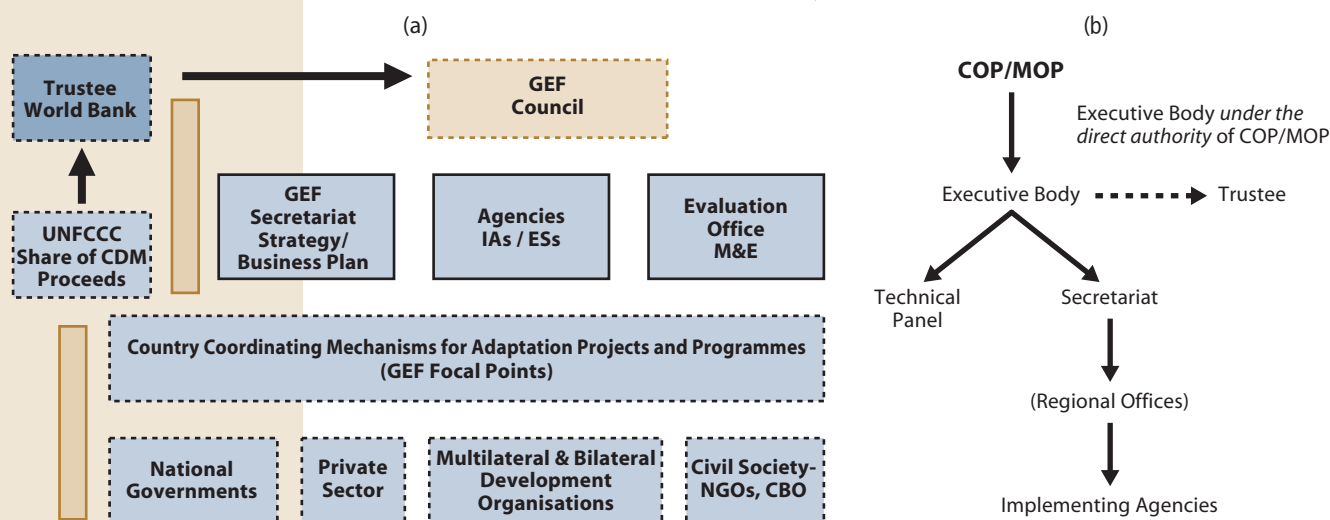
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developing countries must soon come to an agreement so that funding under SCCF can become smooth and effective.

Adaptation Fund (AF): This fund comes from the 2% levy on CDM proceeds and other contributions, if any. The World Bank estimates that the AF is likely to remain small and uncertain, with funds anywhere between US\$ 270 and 600 million by 2012. However, it is worth noting that the funds that will flow will do so at a steady rate, free of the uncertainties of donor replenishment rounds (Müller 2006). COP/MOP1, through its Decision 28/CMP1, provided initial guidance to operation of the AF but its governance structure has yet to be resolved. Recently, the World Bank proposed that it could support in management of the fund while reporting to the GEF Council (Figure 6.2a) and argued that GEF management of the AF with other funds (GEF TF/SCCF/ LCDF) avoids additional costs and time associated with standalone administration of the AF. On the other hand, the Fellows of the European capacity building initiative (ecbi) recently proposed that the Executive Body of the AF should be under the direct authority of the COP/MOP (Figure 6.2b). The fellows considered the AF to be unique because of its unprecedented private sector replenishment through the CDM levy (ECBI 2006).

Figure 6.2 Proposed governance structure of the Adaptation Fund by (a) World Bank (2006) (b) Fellows of the European Capacity Building Initiative (2006)



In addition to the above funds, the EU and other developed countries made a political declaration at COP7 in 2001, to provide US\$ 450 million a year up to 2005, mostly for adaptation. To date, however, only about US\$ 20 million has been provided (ICCTF 2005).

The World Bank estimated that the overall annual costs to adapt to projected climate change could be anywhere between US\$ 9 billion to 41 billion per year¹. However, the total available annual funding for adaptation under the Convention or the Protocol up to 2012 ranges from US\$ 20 million to US\$ 300 million at best. From this viewpoint, it is unrealistic to expect that any new sources of funding available through climate regime negotiations will be able to cover all the costs related to adaptation. It is critical, therefore,

1. See World Bank Environmentally & Socially Sustainable Development and Infrastructure Vice Presidencies, 'Clean Energy And Development: Towards An Investment Framework' Development Committee (Joint Ministerial Committee of the Boards of Governors of the World Bank and the International Monetary Fund on the Transfer of Real Resources to Developing Countries), Washington D.C./USA: 5 April 2006

not to consider adaptation as a stand-alone issue, but in the context of challenges such as poverty alleviation and achievement of MDGs. Further, it is important to determine how various funds available for adaptation could be used in a complementary way in the future.

6.3 Approaches for facilitating adaptation in post-2012 climate regime

The international community has now recognised the need for addressing adaptation in a more balanced manner. However, defining a new approach to address it in the post-2012 regime is a challenge partly because of lack of clarity on the scope of adaptation and limited experience of the countries in implementing adaptation strategies. Burton et al. (2002) noted that the current knowledge of adaptation and adaptive capacity is insufficient for reliable prediction of adaptation, and is inadequate for rigorous evaluation of planned adaptation options, measures and policies. Moreover, it is not yet decided, whether funds available for adaptation could be applied to coping with natural disasters. Such limited experience may also be one of the reasons for the lack of concrete proposals on adaptation (Bodansky et al. 2004). Table 6.3 lists some approaches to strengthen adaptation at the international level, which largely fall into three categories:

- Seven proposals with adaptation as one of the components of a larger framework
- Five proposals with focus on vulnerability, impacts and/or adaptation
- Twelve proposals focusing solely on adaptation financing

Although the final group of proposals solely focus on adaptation financing, many proposals in the first group, which address adaptation as one of the components within a larger framework of climate regime, also touch upon funding issues. Torvanger et al. (2005) and Barrett (2003) recommended the creation of a separate adaptation protocol as complementary to the mitigation regime, but they did not provide information on either components of, or ways to realise the protocol. The global framework proposal by CAN (2003) included adaptation as one of three parallel tracks (together with Kyoto track and decarbonisation track) – and suggested that the most vulnerable countries (e.g. LDCs and SIDS) must be placed under the adaptation track and provided with adequate funds. This proposal, however, does not suggest any new approach to raise funds for adaptation, and appears to rely primarily on existing adaptation funds such as the LDCF and AF. Ott et al. (2004) proposed that the “polluter pays principle” must be the basis for ensuring adequate and predictable revenue streams for adaptation, and recommended modification of GEF rules and establishment of insurance schemes based on public-private partnerships. Gupta (2003) recommended broadening the financial base to support adaptation by levying a tax on all Kyoto mechanisms and indicated the eligibility criteria for countries to receive adaptation funds, while Peck and Teisberg (2003) suggested the use of revenues from permit auctions. However, these proposals lack details on the modalities for such collections. Winkler et al. (2002) proposed that providing support to policies and measures with climate and development benefits could be a way forward to involve developing countries in the future regime. Since adaptation policies enhance the coping capacity and have direct development benefits, they too can be the part of the portfolio. However, the proposal does not specify how adaptation policies and measures should be facilitated in the post-2012 regime.

Defining a new approach to address adaptation in the post-2012 regime is a challenge partly because of lack of clarity on the scope of adaptation and limited experience of the countries in implementing adaptation strategies.

Most of the proposals on adaptation funding are based on ideas of historical responsibility, ability to pay, and “polluter pays principle”.

The second group of five proposals focus on addressing vulnerabilities, impacts and/or adaptation. The Government of Tuvalu (2005) recommended the establishment of a clearinghouse for vulnerability assessment. The Government of India contemplated proposing a protocol to address adaptation at COP8 in 2002 but withdrew it due to objections from AOSIS². However, both these proposals lacked specifics on who, how and on what basis these can be implemented. Downing in 2002 and Müller in 2002 also suggested that adaptation protocol or impacts and adaptation protocol would serve the interests of developing countries in the long run. These protocols are assumed to serve as a suitable counterbalance to the mitigation-centric Kyoto Protocol. Müller (2003) suggested the establishment of an “impacts protocol” by 2005. The proposal by several international agencies made at COP8 underscores the need for mainstreaming adaptation concerns in development planning. The major drawback of the second group of proposals was its emphasis only on the *what to dos* rather than the more practical *how to dos*.

As shown in Table 6.3, there are as many as 12 proposals addressing financing aspects of adaptation, indicating the keen interest of stakeholders on this important issue. Most of the proposals are based on ideas of historical responsibility, ability to pay, and “polluter pays principle”. Of the 12 proposals, four of them seek for creation of new and specialised funds (Government of Tuvalu 2005, TERI 2005, ICCTF 2005, Müller 2002). The proposal by Tuvalu identifies various means to diversify and enhance adaptation funds (solidarity fund and insurance fund to be supported from a levy on fossil fuel sales in Annex I countries, etc.) but it does not assess the feasibility of its implementation. TERI’s proposal, which incorporates convention’s guidance to provide new and additional financing besides compensatory financing, also suffers from the lack of practical means to implement the system. Five proposals suggest improving the flexibility of access to, (Parry et al. 2005) or enlarging the scope [(Bouwer and Aerts 2006, several developing countries (unpublished), Schellnhuber (unpublished), Brazilian proposal (unpublished))] of adaptation funds. In past negotiations, several developing countries proposed that a levy be imposed on transactions under all three mechanisms, while many others opposed an extension of the levy beyond CDM. Assuming that a given amount of revenue is to be raised, applying the same levy to all three Mechanisms, rather than the CDM alone, would result in a small improvement in economic efficiency (Haites and Aslam 2000). Three related groups of proposals focus on funding to reduce the climate change risks. Jaeger (2003) proposed to create a fund based on levy from emissions trading to buy insurance for adaptation costs and damage compensation. The idea of providing insurance was also central to the proposals by AOSIS (specifically to small island low-lying nations for the gradual expected sea-level rise, Germanwatch (against extreme weather events) and IIASA (two-tier insurance scheme). While AOSIS and Germanwatch proposals seek contributions solely from developed countries, the IIASA proposal seeks contributions from both developed and developing countries (Bals et al. 2005). Various other risk management schemes such as insurance pool, catastrophe insurance or micro-insurance (Parry et al. 2005) and risk transfer instruments such as catastrophe bonds (Hamilton

2. India for the first time introduced the idea of an adaptation protocol during G77 and China negotiations at COP8. The original proposal for the text of the Delhi Declaration that was negotiated within G-77 and China on 26 October 2002 contained the following language. ‘To initiate further action necessary for global, regional and sub-national assessment of adverse effects and steps to facilitate implementation of adaptation measures, such action should include the adoption of a Protocol on adaptation.’. The adoption of such an adaptation protocol was not put forward as a G77 and China position due to objections by AOSIS that negotiations for such a protocol would be used by Annex I Parties to distract from discussing the (in)adequacy of their mitigation Commitments.

2004), weather derivatives (Figueres 2005) and weather hedges (Linneroth-Bayer et al. 2003) were also proposed to finance adaptation efforts in developing countries. The major merit of these 12 proposals is that they promote a wide range of adaptation funds, but they also suffer a major drawback in the limited amount of information on feasibility of their implementation.

In view of the inadequacy of current multilateral donor funding for adaptation, Müller and Hepburn (2006) proposed in October 2006 a new proposal entitled "IATAL (International Air Travel Adaptation Levy)" that could attract as much as US\$ 4-10 billion per annum. The proposal aims to link adaptation challenge with a policy for regulating rapidly increasing aviation emissions, and is one of the unique proposals to involve the private sector proactively. However, it was announced after our second round of consultations; hence we could not assess its preference by Asian stakeholders.

Besides the 25 specific proposals mentioned above, there are five generic proposals that implicitly refer to the need for supporting adaptation. Cooper (1998, 2001), for instance, made a proposal on "agreed domestic carbon taxes" in which he noted the need for contingency planning about how best to adapt to more serious climate change. The proposal noted that some revenue from the carbon tax might go to the international community for refugee and peacekeeping operations and to developing countries for economic assistance. Reinstein (2004) proposed a bottom-up, country-driven approach to defining national commitments, which might include: a national emissions target, domestic policies and measures (PAMs), investments in emissions mitigation in other countries, technology transfer, financial contributions, adaptation measures, and so forth. The uniqueness of this proposal is to list adaptation measures as a form of commitment. The dual track (targets-based and PAMs-based) proposal by Kameyama (2003) retains the Kyoto Protocol's adaptation fund as well as country contributions based on historical responsibility, determined by the Brazilian proposal. The "graduation and deepening" proposal by Michaelowa et al. (2003) suggests that LDCs would receive funds for adaptation to negative environmental, economic and social impacts of climate change. The "Orchestra of Treaties" proposal by Sugiyama et al. (2004) is a decentralised approach, involving four components: a group of emissions markets (GEM), to include countries with domestic emissions trading systems; a zero emissions technology treaty (ZETT), to foster long-term technological change; a climate-wise development treaty (CDT), to promote development, technology transfer, and adaptation; and the UNFCCC, as a focal point and forum to address issues on which all countries can cooperate. The CDT would address adaptation issues. The major drawback of the generic proposals is their vagueness in defining the scope and scale of necessary adaptation, and the modalities of ensuring support for adaptation.

The major drawback of the generic proposals is their vagueness in defining the scope and scale of necessary adaptation, and the modalities of ensuring support for adaptation.

Table 6.3 Salient features of proposals to strengthen focus on adaptation in climate regime beyond 2012

Proposal	Distinct Features	Remarks	Reference
I. Proposals including "adaptation" as one of the components of a broader framework			
1. Broadening the climate regime	A three-stage approach to mitigation commitments complemented by the establishment of a separate <u>adaptation protocol</u> <ul style="list-style-type: none"> To secure the transfer of funds and technology to those countries most vulnerable to the impacts of climate change To earmark funding to support the implementation of policies and measures that move recipient countries on to a low-emission development path while increasing their adaptive capacity. 	<ul style="list-style-type: none"> Modalities of implementation of the protocol are not specified. No indication on the scope and scale of adaptation 	Torvanger et al. (2005)
2. Technology centered approach	<ul style="list-style-type: none"> Includes a protocol for adaptation assistance as one of the five components and visualises adaptation fund to be financed by contributions from industrialised countries; Other components are: <ul style="list-style-type: none"> an R & D protocol to "push" the development of new technologies protocols establishing technology standards to provide a "pull" incentive to commercialise new, low-emitting technologies a multilateral fund to help spread new technologies to developing countries a short-term system of "pledge and review" 	<ul style="list-style-type: none"> Modalities of implementation of the protocol are not specified. No indication on the scope and scale of adaptation funding 	Barrett (2003)
3. Global framework	<ul style="list-style-type: none"> Division of countries into three parallel, interlinked commitment tracks – Kyoto track (Annex I countries), de-carbonisation track (major developing countries with high emissions) and adaptation track (for most vulnerable regions) Existing elements of the UNFCCC/Kyoto Protocol would form part of the adaptation track including SCCF, AF, LDC Fund and GEF funds. 	<ul style="list-style-type: none"> No new initiatives to mobilise additional funds necessary to support countries in adaptation track 	CAN (2003)
4. Global climate agreement based on south-north dialogue on equity in the greenhouse	<ul style="list-style-type: none"> Global and comprehensive approach involving differentiation of countries into six groups each with a different package of mitigation, adaptation and financial commitments. Proposal includes ensuring adequate and predictable revenue streams for adaptation, based on the "polluter pays principle"; modification of GEF rules to allow funding of adaptation projects with local benefits; and piloting of insurance schemes, possibly through public-private partnerships Support for capacity building in developing countries in a range of areas including sector-specific adaptation strategies, sensitisation of policy-makers, public awareness, and negotiating skills 	<ul style="list-style-type: none"> Modalities of application of the polluter pays principle are not explained. No details on how to modify GEF rules are provided. 	Ott et al. (2004)
5. KISS (Keep It Simple, Stupid)	<ul style="list-style-type: none"> Differentiation into 12 categories of countries based on three criteria: gross national product/capita, emissions/capita, human development index Countries with total emissions below three million metric tons are eligible for assistance for adaptation. Adaptation fund must be financed by tax on all flexibility mechanisms, not just the CDM. 	<ul style="list-style-type: none"> Ignores the adaptation needs of vulnerable regions in countries with emissions above 3 million metric tons Modalities of allocation of adaptation fund are not explained. 	Gupta (2003)
6. Long term permit programme	<ul style="list-style-type: none"> Long-term approach aimed at reaching an agreed concentration target by a specified date (for example, 2070), through national emission trading programmes in the major emitting countries Advocates negotiations among a larger group of countries on financial support for adaptation, possibly from revenue generated from permit auctions 	<ul style="list-style-type: none"> Modalities of implementation are not specified. 	Peck and Teisberg (2003)
7. Sustainable Development Policies and Measures (SD PAMs)	<ul style="list-style-type: none"> Developing country "commitments" initially take the form of pledges to implement national sustainable development policies, which would be listed in a registry. The basic function of a pledge-based approach is transparency. By making a pledge, a state opens itself up to international scrutiny of the pledge's adequacy and implementation. 	<ul style="list-style-type: none"> Does not directly address adaptation measures although SD-PAMs might relate to adaptation 	Winkler et al. (2002)
II. Proposals focusing solely on "vulnerability assessment" "impacts" and/or "adaptation"			
1. Vulnerability assessment clearinghouse	<ul style="list-style-type: none"> Vulnerability assessment clearinghouse would operate as a toolbox for assisting countries with implementation of their vulnerability assessments 	<ul style="list-style-type: none"> Modalities of implementation are not specified. 	Government of Tuvalu (2005)
2. Impacts and adaptation protocol	<ul style="list-style-type: none"> Proposal to compensate developing countries for climatic disasters 	<ul style="list-style-type: none"> Very few details on modalities of implementation 	Müller 2002-2005 (Various opinion pieces)
3. Impacts protocol	<ul style="list-style-type: none"> Proposal focusing on reducing the adverse impacts of climate change 	<ul style="list-style-type: none"> Very few details on modalities of implementation 	Downing 2002 (Unpublished)
4. Adaptation protocol	<ul style="list-style-type: none"> Proposal focusing on international support to facilitate adaptation policies and measures in developing countries 	<ul style="list-style-type: none"> Modalities of implementation are not specified. 	Govt. of India 2002 (unpublished)
5. Mainstreaming adaptation in development	<ul style="list-style-type: none"> Encouraging a ministry with a broad mandate, such as planning or finance, to be fully involved in mainstreaming adaptation, especially in countries where major climate impacts are expected 	<ul style="list-style-type: none"> More explanation on "what to do: rather than "how to do" 	AfDB et al. 2003

Table 6.3 (continued)

Proposal	Distinct Features	Remarks	Reference
III. Proposals focusing on “financing for adaptation”			
1. Specialised funds	<ul style="list-style-type: none"> • Solidarity Fund with mandatory contributions to support preventative measures and relief from impacts, and Climate Change Insurance Fund to meet the restorative costs of the impacts of climate change • Financing for such a fund could come from a share of proceeds from a levy on fossil fuel sales in Annex I countries, contributions from governments, insurance funds and high GHG emitting industries 	<ul style="list-style-type: none"> • Very few details on modalities of allocation of insurance fund to developing countries 	Government of Tuvalu (2005)
2. TERI’s alternative perspective on adaptation financing	<ul style="list-style-type: none"> • New financing for adaptation measures which provide regional and global public goods • Additional financing to enhance adaptive capacity at national level – to top-up development aid • Special compensatory financing designed on fairness and “polluter pays” principle 	<ul style="list-style-type: none"> • Differentiation of activities is challenging • Details on modalities of implementation are lacking 	TERI (2005), Friends of the Earth web site
3. ICCTF proposal on funding for adaptation	<ul style="list-style-type: none"> • New and additional funding is provided to guarantee revenue for adaptation, with contributions linked, in part at least, to current and historical responsibility for emissions • Existing funding commitments on adaptation must be honoured. The EU and other developed countries made a “political declaration” at COP7 in 2001, to provide US\$450 million a year, mostly for adaptation. To date only about US\$20 million provided. • Pursue the establishment of an international compensation fund to support disaster mitigation and preparedness 	<ul style="list-style-type: none"> • Very few details on modalities of implementation 	ICCTF (2005)
4. UNFCCC Impact Response Instrument	<ul style="list-style-type: none"> • Establish UNFCCC Disaster Relief Fund to be financed by contributions from industrialised countries (based on historical responsibility for climate change and ability to pay); • Relief, rehabilitation and recovery efforts will be compensated through the use of this instrument. 	<ul style="list-style-type: none"> • Very few details on modalities of implementation and on linkages with other initiatives in disaster risk management 	Müller (2002)
5. Improved flexibility for adaptation funding	<ul style="list-style-type: none"> • Introduce more flexible approaches to funding adaptation activities, particularly with respect to the incremental costs and co-financing requirements in operationalising the LDCF and SCCF 	<ul style="list-style-type: none"> • Modality of implementation to be worked out 	Parry et al. (2005)
6. Two-track approach for adaptation funding	<ul style="list-style-type: none"> • Track 1 to secure climate change adaptation funding under the UNFCCC, by imposing a fixed percentage of gross domestic product (GDP) for Annex I countries • Track 2 to improve mainstreaming of climate risk management in development efforts 	<ul style="list-style-type: none"> • Very few details on modalities of allocation of funds to developing countries 	Bouwer and Aerts (2006)
7. Enhancing the base of adaptation fund	<ul style="list-style-type: none"> • Broadening adaptation levy from CDM to JI and IET 	<ul style="list-style-type: none"> • Developed countries do not wish to expand the scope beyond CDM proceeds • Few details on implementation 	Several DCs (unpublished)
8. Adaptation credits and vouchers	<ul style="list-style-type: none"> • Conceptually adaptation credits are equivalent to carbon credits 	<ul style="list-style-type: none"> • Measures for quantification of adaptation credits are not available. 	Schellnhuber (unpublished)
9. Brazilian proposal on burden-sharing approach	<ul style="list-style-type: none"> • Original pre-Kyoto proposal made by Luiz Gylvan Meira Filho and José Domingos Gonzalez Miguez with Luiz Pinguelli-Rosa provided that up to 10% of the Clean Development Fund could be used to finance adaptation projects in developing countries. 	<ul style="list-style-type: none"> • No follow-up for a long time 	Filho, Miguez and Rosa (unpublished)
10. Insurance fund for adaptation and other insurance schemes	<ul style="list-style-type: none"> • Jaeger’s proposal seeks to establish a mechanism for payments by emitting countries to countries that are adversely affected by climate change, in order to cover adaptation and damage costs. In this, revenues from a levy on emissions trading would be used to buy insurance for adaptation costs and damage compensation • AOSIS proposal seeks to establish a fund with mandatory contributions from industrialised countries to indemnify small-island and low-lying developing nations for losses resulting from sea-level rise. • Germanwatch proposal builds strongly on AOSIS ideas but proposes cover for sudden-onset risks, including floods, droughts and windstorms, for public infrastructure. To be eligible, LDCs would be required to take specified measures for preventing disaster loss. 	<ul style="list-style-type: none"> • Both AOSIS and Germanwatch proposals rank high on many elements of fairness and efficiency, but payouts depend on a loss threshold, which means losses must be measured. The latter involves high transaction costs (Bals et al. 2005). 	Jaeger (2003), Germanwatch (2005), AOSIS 1991, cited by Bals et al. (2005)

Table 6.3 (continued)

Proposal	Distinct Features	Remarks	Reference
11. Risk management schemes	<ul style="list-style-type: none"> • International Insurance Pool (a collective loss-sharing fund to compensate the victims of sea-level rise, to be administered by a Board under the UNFCCC and funded by mandatory contributions from industrialised countries in proportion to their GHG emissions and GNP (Hamilton 2004; Linnerooth-Bayer et al 2003; Muller 2002). • Public-Private Insurance Partnerships • Regional Catastrophe Insurance Schemes (Mandatory contributions from member governments will be used to pool regional cash reserves, which are then used for on-lending to members affected by a weather catastrophe (DFID 2004). These schemes or risk pools could be backed by a regional facility that provides a layer of reinsurance cover.) • Micro-insurance (Uses risk-pooling to provide compensation to low income individuals or groups adversely affected by a specified risk or event (Hoff et al. 2004). Schemes can be index-based (Skees et al. 1999) and should be developed jointly with governments, NGOs and private companies. Examples include local calamity funds, savings and credit schemes) 	<ul style="list-style-type: none"> • Very few details on modalities of implementation and on linkages with other initiatives in disaster risk management 	Parry et al. (2005)
12. Risk Transfer Instruments	<ul style="list-style-type: none"> • Catastrophe bonds (Provide private insurers with protection against extreme natural catastrophe events. Capital is provided by institutional investors, with money raised on the stock market by issuing bonds against a particular catastrophic event (DFID 2004; Hamilton 2004). The market for these bonds is targeted primarily to OECD countries and its potential in developing countries has not yet been fully explored.) • Weather derivatives (financial mechanisms developed to hedge financial risk associated with weather volatility. They are financial contracts whose value is tied to, or derived from, an underlying asset such as a temperature or precipitation index. While the weather derivative market continues to grow in the USA and Europe, developing countries have not yet been engaged) • Weather hedges (provide farmers with protection against extreme weather events. Insurance against a specific local weather phenomenon is sold by banks, farm cooperatives and micro-finance institutions to buyers at the same premium, who in turn receive the same indemnity payment per unit of insurance. Catastrophe bonds can be used to backstop this micro scheme to ensure that the insurance provider has sufficient capital to cover claims, Linnerooth-Bayer et al. 2003) 	<ul style="list-style-type: none"> • Very few details on modalities of implementation and on linkages with other initiatives in disaster risk management 	UNEP-FI (2005) Cited by Parry et al. (2005)
13. International Air Travel Adaptation Levy (IATAL)	<ul style="list-style-type: none"> • The proposal aims to link adaptation challenge with policies aimed at managing aviation emissions. • Aims to bring about an income of US\$ 4-10 billion annually. 	<ul style="list-style-type: none"> • Modalities of allocation of levy are not established. • Active involvement of the private sector in adaptation 	Müller and Hepburn (2006)

6.4 Perspectives of different countries

Addressing adaptation comprehensively under future climate regime has been a subject of controversy between developed and developing countries for a long time in international negotiations. Of course, this does not mean developing countries have had a common position on adaptation. The starkly diverse political and economic interests of countries in groups such as the G77 and China made it difficult for these countries to develop a common position. This section discusses differences in the perspectives of developed and developing countries on general issues of adaptation, financing for adaptation and on proposals to strengthen adaptation in future regime.

6.4.1 General issues of adaptation

In our consultations, most of the participants recognised that adaptation to climate risks and climate change is a challenge for all countries. However, they noted that the international climate regime should first target the urgent needs of the most vulnerable countries, regions and communities. Participants from the Asian LDCs and SIDS emphasised that any future international regime should address their adaptation needs more comprehensively, as their nations contributed the least to the problem but remain the most vulnerable. A few participants (e.g. Republic of Korea, Japan) in our consultations noted that many developed countries had not yet developed a national adaptation policy, and that the future climate regime must focus on assisting all countries to develop such policies based on the exchange of positive experiences among countries. Some participants noted that the experiences of NAPA preparation by LDCs could be useful to developed countries. Participants from China, Mongolia and Thailand suggested that the future climate regime should support the development of national adaptation programmes of all developing countries. Currently such support is limited to LDCs through the LDC Fund.

Most participants agreed that adaptation did not receive as much priority as mitigation in the current regime due to several reasons. Some participants (e.g. Nepal) noted that it was perhaps due to wide differences in perceptions of developed and developing countries, as the former view nature as the main victim while the latter view human beings as the main victim of climate change. Burton et al. (2002) reported that the developed countries showed less interest in their own need for adaptation, and generally assumed that they have the financial and technical resources to adapt as and when necessary. A few participants (e.g. the Philippines) expressed strong dissatisfaction with the implementation of SCCF and SBSTA's five year work programme, and emphasised that the future climate regime must squarely deal with the adaptation challenge more proactively than before. They noted that the first two years of SBSTA's five year programme does not go beyond submitting views and holding workshops to exchange information. Some participants (e.g. Cambodia) recommended the establishment of an international registry of adaptation projects under the UNFCCC.

Many participants from Asian developing countries (e.g. Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Mongolia, Nepal, the Philippines) emphasised that developed countries are not seriously committed to supporting adaptation even though the international community has recognised their enormous contribution to the problem to date and that the focus on scientific uncertainties was only an excuse for their delayed

Some participants expressed strong dissatisfaction with the implementation of SCCF and SBSTA's five year work programme, and emphasised that the future climate regime must squarely deal with the adaptation challenge more proactively than before.

action. They repeatedly mentioned that the Kyoto Protocol is not adequate to advance the adaptation agenda. Some participants (e.g. Mongolia, Myanmar, Nepal) noted that the lack of a consistent position among developing countries on ways to address adaptation in the future climate regime was a major barrier to be overcome in the future. They noted that tensions among developing countries on prioritisation of SCCF activities (section 6.2.3), the lack of human and institutional capacity to undertake vulnerability and adaptation assessments, the lack of continuity in representation of developing country negotiators due to limited funding for their participation in UNFCCC meetings, and language difficulties prevented progress in advancing the adaptation policy agenda. A few participants (e.g. China) reported that many Asian developing countries lack the capacity to prioritise adaptation actions in different parts of the country due to limited experience. They maintained that the future climate regime should provide support in building such capacity in developing countries.

Participants (e.g. Bangladesh, Mongolia) noted that adaptation programmes targeting communities should be supported more proactively in the international climate regime and that they should be recognised for their provision of global benefits as they would contribute directly to the goal of poverty alleviation. However, current GEF guidelines suggest that global environmental benefits are distinct from the achievement of development or local benefits (Mace 2005). Many participants (e.g. Mongolia, Bangladesh, Nepal, Philippines, Cambodia, Indonesia) emphasised that the future climate regime must support initiatives for proactive micro-adaptation at the community level. They opined that the current allocation of US\$ 5 million as part of the GEF Strategic Priority on Adaptation is woefully inadequate to meet the needs of community-based adaptation. Some participants (e.g. Mongolia) noted the need for enhancing support of development, transfer and deployment of adaptation technologies, especially for sectors such as agriculture, coastal resource management and biodiversity.

In view of the limited exchange of international experiences on adaptation to date, and due to the fact that most of the adaptation is site-specific with local benefits, several respondents from developed countries (e.g. Australia, Belgium, Japan, USA) noted that adaptation should be considered largely a national responsibility and that the international climate regime should play only a facilitative role. However, some adaptation projects provide public goods with global benefits. For example, establishing an early warning system for extreme climate events will provide nearly universal benefits. The scientific uncertainties in differentiating impacts of climate variability and climate change were also cited as a reason for the limited progress on adaptation funding in the current regime. They suggested that support for adaptation initiatives under the future climate regime must be based on valid science.

6.4.2 Adaptation funding

Our consultations and personal interviews indicated some degree of conceptual conflict between developed and developing countries in determining whether adaptation funding is merely assistance for adaptation or compensation for impacts of all extreme weather events, and whether such assistance should cover climatic variability or only anthropogenic climate change. Notwithstanding such differences, there was consensus among participants that currently available funds for adaptation under the Convention and the Protocol are far from adequate to meet the adaptation needs in developing

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countries, which could range from US\$ 9 to 41 billion per annum (World Bank 2006c). Judging from the fate of the 0.7% of GDP 'Monterrey commitment', Müller and Hepburn (2006) noted that it would be near impossible politically for industrialised countries to try and raise this sort of additional money to cover these costs through domestic taxation. Some participants from LDCs (e.g. Bangladesh, Bhutan, Mongolia) and SIDS (e.g. Maldives) emphasised that external funding would remain a key prerequisite for successful implementation of activities identified in NAPAs, and were concerned about a tendency in some circles to treat adaptation merely as a sub-set of CDM. They cautioned that CDM proceeds for adaptation are at most only adequate to identify adaptation needs of developing countries.

In order to enhance "new and additional" funds for adaptation, participants from Bangladesh suggested that an exclusive priority adaptation fund should be created through the imposition of a levy on the sale of fossil fuels in all Annex I countries. A representative from Tuvalu made a similar proposal to create an Adaptation Financial Facility through the imposition of levies on (a) fossil fuel sales in Annex I countries and (b) Kyoto mechanisms other than the CDM (Sopoaga 2006). Many participants (e.g. India) sought the need for incorporating an element of certainty in adaptation funding, besides voluntary contributions, to ensure a long-term, firm, regular and predictable flow of funds. Some participants suggested revisiting the funding pledges by developed countries (US\$ 450 million per year). Many participants urged that the complex bureaucratic procedures of GEF and SCCF must be streamlined in the future regime. They also requested that the co-financing requirement to access LDC Funds and SCCF must be removed especially for LDCs and SIDS. Participants from Sri Lanka proposed the implementation of higher tax regimes for technologies that are inappropriate for facilitating adaptation.

Developed countries, on the other hand, are concerned that adaptation could become a bottomless pit, absorbing a disproportionate amount of development assistance funds (Burton et al. 2002). Some participants (e.g. Japan) argued that assistance for adaptation through various initiatives such as ODA is relatively large and must not be ignored.

The consultations revealed the need to distinguish between, and prioritise adaptation actions that can be funded through international and national efforts of developing countries.

6.4.3 Preferences for specific proposals to strengthen adaptation

The preferences reported here are based on the presentations by lead discussants and panel members in various consultations in addition to the 47 responses to the questionnaire. Of the first group of seven proposals, which considered adaptation as one of the components of a larger framework, several participants and 56% respondents to the questionnaire strongly preferred the proposal by Ott et al. (2004). The proposal by the CAN (2003) also received much attention (34%). A few participants (e.g. Bangladesh, China, Philippines), however, preferred proposals by Torvanger et al. (2005), and Gupta (2003), and noted that financing for adaptation should be based on per capita GHG emissions and that the nations that contribute less should be rewarded especially when they have high adaptation needs.

Many participants sought the need for incorporating an element of certainty in adaptation funding, besides voluntary contributions, to ensure a long-term, firm, regular and predictable flow of funds.

The concept of creating a separate protocol on adaptation, as a counter-balance to the mitigation-centric Kyoto Protocol, has been receiving some attention by researchers and policy makers since 2002.

Among the second group of proposals, most of the participants and respondents to the questionnaire (76%) preferred the proposal on mainstreaming adaptation concerns in the development policy of national governments, regional and international aid agencies and development banks. However, participants noted the need for suitable entry points for such mainstreaming and the need to strengthen the capacity of policy makers to visualise the benefits of such mainstreaming. Huq (2004), however, pointed out that mainstreaming adaptation in development activities is a laudable and necessary goal in its own right but it is not necessarily the right issue to negotiate in the UNFCCC context. Likewise, Yamin (2005) questioned if mainstreaming adaptation is a distraction or part of the solution in future climate policy of the European Union.

Among the proposals on financing, several respondents (46%) preferred TERI's alternative perspective on adaptation financing, followed by the two-track approach (27%) proposed by Bouwer and Aerts (2006). The preference for the first proposal is perhaps because it gives clear guidance on what constitutes new and additional funding. The preference for the latter proposal is perhaps associated with its emphasis on mainstreaming of climate risk management in development efforts, which is highly similar to the one proposed by international agencies in the second category of proposals.

6.5 Three priorities for strengthening adaptation policy agenda

Strengthening adaptation policy agenda in the future climate regime is a challenging task, especially when we consider the magnitude of the problem and the resources that we have at our disposal. Participants in our consultations discussed various options that can be put forward to climate change negotiators. Of these options, we identified three priority areas that deserve utmost attention. These include (a) establishing a separate protocol for adaptation, (b) optimising top-down and bottom-up approaches with a view to mainstreaming adaptation in development planning, and (c) financing for adaptation.

6.5.1 Adaptation protocol

The concept of creating a separate protocol on adaptation, as a counter-balance to the mitigation-centric Kyoto Protocol, has been receiving some attention by researchers and policy makers since 2002. For instance, Müller (2003) noted that Indian's proposal for an "Adaptation Protocol" made at COP8 deserves further attention, but he felt that in the short term less ambitious measures, such as a reform of international natural disaster relief financing, may be more promising. Sharma (2003) also observed that the impacts of climate change can be addressed in the short term through a climate change relief fund along the lines of existing disaster relief funds, insurance and the GEF funds, and in the long term through a more detailed *adaptation protocol*. On the other hand, Drexhage (2003) noted that an adaptation protocol would effectively marginalise funding for this critical area. He argued that much more effective would be a response that would mainstream adaptation in development priorities of aid agencies, multilateral and regional banks and developing countries. Winnie et al. (2005) noted that any adaptation efforts in the future climate regime must be based on the UNFCCC (rather than the Kyoto Protocol) and non-UNFCCC instruments, such as the existing international disaster relief arrangements.

Several participants (e.g. Bangladesh, Bhutan, Cambodia, China, Nepal) in our consultations noted that the design of a separate protocol on adaptation is critical to enhance its profile and to coordinate adaptation actions and programmes internationally. Participants noted that such a protocol should be based on the “polluter pays principle”, “historical responsibility” and “equity” and comprise at least four components: a policy framework for mainstreaming adaptation in development with specific targets, capacity building of various actors involved, mechanisms for financing of adaptation efforts, and options for development, transfer and deployment of adaptation technologies. Participants agreed that the current regime had succeeded in initiating some efforts towards the first two aspects but much remains to be done to enhance financing and adaptation technologies. In the case of mitigation, market mechanisms were created to facilitate the transfer of technologies and finance but the practicality of implementing such mechanisms in adaptation remains to be seen. While some participants (e.g. Mongolia, China, Sri Lanka, Viet Nam) noted the need for creating market mechanisms for adaptation for facilitating financial flows, some participants (e.g. the Philippines) cautioned that market mechanisms should not be the primary means to support adaptation, and noted that any new institutional framework for adaptation should be set up in a timely fashion without allowing it to become a long negotiating instrument. Participants stressed that a global campaign to raise consciousness on the adaptation protocol is necessary.

Many participants (e.g. Japan, Indonesia, India), however, noted that the creation of a separate protocol for adaptation is not necessarily productive at this stage. Some feared that giving undue emphasis to adaptation might weaken the efforts on mitigation, while others (e.g. Indonesia) were concerned about the long negotiating process necessary to develop such a protocol. Some participants (e.g. Indonesia, the Philippines) were not sure of the components to be included in the protocol, while others (e.g. Japan) noted that the time for adaptation protocol may not be appropriate, as there was no consensus on who should bear the costs of adaptation. This is because some developed countries believe adaptation solely to be the responsibility of the country in question, while some developing countries argue that developed countries should bear such expenses. The overall sentiment of the participants was that there is a clear need for the future climate regime to prioritise the areas that require urgent action, as opposed to attempting to adapt to every single impact of climate change in one go.

In view of such diverse views, it is recommended that the future climate regime must first begin to explore the concept of adaptation protocol in a more formal way, and obtain views of different Parties perhaps through organising a special workshop or seminar in conjunction with meetings of the subsidiary bodies or COPs at the earliest. Based on the outcomes of discussions, an exploratory committee for the adaptation protocol may be established if necessary.

6.5.2 Mainstreaming adaptation concerns in development planning

Adaptation, sustainable development and equity are mutually reinforcing (IPCC 2001b). It is widely accepted that impacts of climate change will undermine long-term economic development, increase poverty and damage human security. How to identify and design incremental interventions to integrate adaptation concerns in development, and then implement them across many sectors is a serious challenge for policy makers.

Participants stressed that a global campaign to raise consciousness on the adaptation protocol is necessary.

The overall sentiment of the participants was that there is a clear need for the future climate regime to prioritise the areas that require urgent action, as opposed to attempting to adapt to every single impact of climate change in one go.

A combination of both “top-down” support and “bottom-up” engagement approaches is crucial to advance the adaptation agenda.

Lack of awareness of climate change within the development community, limitations on resources for implementation, barriers within governments and donor agencies, insufficient relevance of available climate information to development-related decisions are the most frequently cited reasons for difficulties in mainstreaming adaptation in development (Warrick 2000, Agrawala 2004, OECD 2005, 2006). Mainstreaming can be done at both policy and operational levels. Developing water management policies based on projected impacts of climate change on precipitation in 20 or 50 years is an example of the policy-level mainstreaming. Operational level mainstreaming, on the other hand, refers to the process of critically analysing and addressing adaptation concerns in actual implementation of activities. It is often referred to as “climate proofing” of development. Likewise, both “top-down” institutional mainstreaming and “bottom-up” community-level mainstreaming are possible. Other mechanisms for mainstreaming include the incorporation of adaptation concerns into the National Strategies for Sustainable Development (NSSD) and Poverty Reduction Strategy Papers (PRSPs). Indeed many of the changes required in the transition to mainstreaming may not be costly but require changes in existing policies, institutions, and infrastructure design (IGES 2005b).

Most of the participants and respondents to the questionnaire surveys (92%) agreed that a combination of both “top-down” support and “bottom-up” engagement approaches is crucial to advance the adaptation agenda, as both approaches are important and complementary. Participants from Bangladesh and Bhutan noted that grassroots adaptation should begin with bottom-up needs assessment through a participatory approach by ensuring that the vulnerable communities define the contexts of vulnerability and devise plans for adaptation. A few participants (e.g. the Philippines) noted that some adaptation policies and measures need to emanate from the national level and filter down to the community level. A few other participants (e.g. Japan), noted that top-down approaches must come first, followed by bottom-up approaches involving self-help efforts by communities and local governments. The need for enhancing the capacity of local communities to understand climate information products including early warning systems was also considered important.

Participants emphasised the need for documenting the analytical tools and knowledge in both types of approaches. For example, the database on local coping strategies (UNFCCC 2006h) has potential to become a toolkit of good practices, which would enable policy makers and adaptation practitioners to pick and mix tools and practices that best suit their circumstances. Likewise, documentation of experiences of top-down operational level mainstreaming [e.g. climate proofing of road design in Kosrae island of the Federal States of Micronesia (Hay et al. 2004)] would encourage policy makers to undertake similar initiatives in other contexts.

6.5.3 Promoting financing for adaptation

Adaptation funding has already become an intractable issue in current climate change negotiations, and greater demand for funding can be expected in the future as climate change proceeds. Participants in our consultations, therefore, agreed that innovative approaches to funding adaptation in the future climate regime must be pursued. Some participants (e.g. the Philippines) argued for re-defining financial mechanisms of the Convention and the Kyoto Protocol in the post-2012 climate regime, while others (e.g. Nepal) opined that different types of costs for adaptation will have to be dealt with via

different kinds of instruments. Some participants (e.g. Bangladesh) noted that principles of justice and equity are intrinsically linked in the adaptation funding negotiations, and these principles need to be acknowledged and addressed up front if the future climate regime is to retain any sense of fairness and global acceptance (Huq 2004).

The role of the private sector in facilitating adaptation in the current regime has been minimal. Many participants, therefore, highlighted the need for effectively engaging the private sector in adaptation efforts. Some participants (e.g. Indonesia), noted that the World Bank and regional development banks, such as ADB are preparing investment frameworks to secure greater investment in adaptation projects (Burton and Aalst 2004). It was suggested that the private sector could be actively involved in such efforts. Some participants (e.g. Mongolia) suggested that considerable scope exists in a post-2012 regime to establish market mechanisms for adaptation, for example through arranging special credits for initiatives that facilitate adaptation in developing countries. However, the concept of adaptation credits is still conceptual and further elaboration is necessary to convince the policy makers and markets. Participants from Republic of Korea noted that food companies, businesses involved in commodity trading, and the insurance industry would be interested in acquiring such credits. However, some participants (e.g. Japan) noted that adaptation credits might bring down the value of carbon credits. A few participants (e.g. Cambodia) suggested that the future regime should provide economic incentives for investment in adaptation by the private sector such as tax holidays and subsidies. They also suggested that CDM project developers and private investors should not have to be burdened by mandatory proceeds given to the adaptation fund, as CDM projects already contribute to sustainable development. Instead, they suggested that fossil-fuel based projects should contribute to the adaptation fund.

Participants felt that the role of insurance instruments needs further attention if we are to increase resources available for adaptation in the future climate regime. Although the UNFCCC Article 4.8 and the supporting Article 3.14 of the Kyoto Protocol call upon developed countries to consider actions, including insurance, to meet the specific needs and concerns of developing countries in adapting to climate change, there has been little understanding of, or agreement within the climate change community to date on the role that insurance-related mechanisms can play in assisting developing countries adapt to climate change (Bals et al. 2005). Promoting linkages between the climate community and the insurance industry could be a way forward. Indeed a number of the insurance and risk transfer instruments could be integrated into a post-2012 approach to adaptation.

A few participants (e.g. Japan) argued for developing a two-track approach to adaptation funding. Track 1, which could be outside the purview of the international climate regime, would be a soft regime to include mainstreaming adaptation concerns in development assistance and track 2, which could be within the framework of climate regime, would be a hard regime to include allocation of special funding to develop NAPAs or the creation of adaptation facilitation centres in the most vulnerable countries. The future climate regime should facilitate synergies between both approaches. Some participants from LDCs (e.g. Cambodia) and SIDS (e.g. Maldives) argued that a certain share of proceeds from ODA should be allocated for adaptation. However, there is concern that funding for adaptation would divert money from ODA that is meant to address challenges seen as being more urgent than climate change, including water and food supply, sanitation, education and health care (Michaelowa and Michaelowa 2005).

A number of the insurance and risk transfer instruments could be integrated into a post-2012 approach to adaptation.

Some participants (e.g. Bangladesh, Cambodia) highlighted the need for changes in implementation of adaptation funds in the future regime. They emphasised that the AF should not be subject to GEF criteria of identifying incremental costs and the requirement of co-financing. A recent proposal by ECBI Fellows suggests that AF should be managed by a special body to be created COP/MOP (ECBI 2006). Several countries (e.g. Nepal, Mongolia, Thailand, the Philippines, Indonesia, Maldives) in the region argued for simplification of the criteria for accessing funds under the LDC, SCCF and GEF to reflect each recipient country's circumstances.

Some participants (e.g. Bangladesh, India, Mongolia) noted that it is not desirable to link adaptation funds with mitigation efforts in developing countries. However, they preferred to see some additional allocation of adaptation funds if developing country parties voluntarily reduce emissions through domestic policies and measures. Participants also emphasised that the future regime should promote synergies between mitigation and adaptation actions. For example, prevention of deforestation can reduce GHG emissions while also contributing to enhanced adaptive capacity of local communities.

In summary, the adaptation financing agenda for the future climate regime will need further honing and clarity, especially in terms of (a) enlarging the funding base and developing flexible but clear guidance to access adaptation funds, (b) differentiating between actions that must be funded inside and outside the climate regime, and (c) creating market mechanisms and incentives for the private sector.

In order to advance the adaptation agenda internationally, countries in the Asia-Pacific region should first proactively develop a regional forum on adaptation that can elaborate on necessary frameworks to address the adaptation needs of the region.

6.6 Concluding remarks

IGES consultations reaffirmed the need for redressing the balance of the current climate regime by giving due attention to the adaptation needs of Asian developing countries and undertaking new efforts that extend beyond the scope of the current climate framework. Such new efforts may evolve into the establishment of a separate protocol for adaptation in the long run. Since adaptation is a dynamic multi-faceted process (Willems 2005) involving decision making at all levels, it must be considered in an integrated manner locally, nationally and internationally by mainstreaming adaptation concerns in development planning and policy. Stakeholders at our consultations emphasised that the costs of implementing adaptation strategies would depend in part on the degree of success in integrating adaptation concerns in other policy initiatives. At national and local levels, the adaptation decision-making process should involve a "precautionary approach" with an initial preference for "no/low regrets" measures. However, due to the considerable uncertainty surrounding local impacts, decision makers must be ready to review and even reverse adaptation strategies in the light of new knowledge. As the challenge of adaptation cannot be addressed solely through the funds made available through international negotiations and donor funding, efforts to enhance adaptation funds through active involvement of the private sector are crucial.

In order to advance the adaptation agenda internationally, countries in the Asia-Pacific region should first proactively develop a regional forum on adaptation that can elaborate on necessary frameworks to address the adaptation needs of the region. Instead of floating general concepts and oft-repeated principles, the negotiators from the region must put forward and defend well-defined and workable proposals to facilitate adaptation at various levels. Second, the adaptation practitioners from the region must

document information on high priority adaptation projects that go beyond planning and capacity building. Third, a suitable mechanism to monitor effectively the transfer of new and additional funding from developed to developing countries is also necessary. Options for establishing a mandatory global funding scheme, which is tied to both past and current GHG emissions by various countries, should be explored as a high priority so that all countries, both developing and developed, can contribute to and benefit from such scheme based on the principle of common but differentiated responsibility.