



# International funding to support urban adaptation to climate change

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1. Müller, B (2008), "International adaptation finance: the need for an innovative strategic approach", Background Policy Paper for the Climate Strategies Project on Post-2012 Policy Framework: Options for the Tokyo G8 Summit, Oxford Institute for Energy Studies, UK.

2. World Bank (2006), *Clean Energy and Development: Towards an Investment Framework*, ESSD-VP/1-VP, World Bank, Washington DC, USA, 5 April, x+38 pages.

3. ActionAid (2007), *Compensating for Climate Change: Principles and Lessons for Equitable Adaptation Funding*, Action Aid, Washington DC, USA.

4. Oxfam International (2007), "Adapting to climate change: what's needed in poor countries and who should pay", Oxfam Briefing Paper 104, Oxfam, Washington DC, Brussels, Geneva and New York.

**ABSTRACT** Recent estimates of the costs of adaptation to climate change in low- and middle-income countries are in the range of tens of billions of dollars per annum. The costs of adaptation in cities will account for a significant proportion of this average largely because of the expense required to adapt (or, in the case of many low- and middle-income countries, build new and resilient) infrastructure and services for densely populated areas. This paper discusses existing international funding to support adaptation needs (primarily through the United Nations Framework Convention on Climate Change (UNFCCC) and official development assistance (ODA)), the serious shortfall in these funds, and opportunities for meeting the gap in funding. It pays particular attention to channelling funding to the most vulnerable urban stakeholders, taking into account the political and institutional constraints to the adaptive capacity of these groups.

**KEYWORDS** adaptation / cities / climate change / development / finance

## I. INTRODUCTION

While estimates of the costs of adaptation to climate change remain vague, especially for low- and middle-income countries, recent approximations of current needs are in the range of tens of billions of dollars per annum<sup>(1)</sup> and well in excess of levels of official development assistance (ODA). The World Bank estimates that climate proofing development investments (including ODA and concessional finance, foreign direct investment and gross domestic investment) in low- and middle-income countries alone will cost between US\$ 10 billion and US\$ 40 billion annually.<sup>(2)</sup> This figure has since been criticized for not taking into account the costs of climate proofing existing supplies of natural and physical capital where no new investment is planned, the costs of financing new investments specifically to deal with climate change, or the costs to households and communities to fund their own adaptation needs.<sup>(3)</sup> More recent estimates by Oxfam that do acknowledge these factors put the costs of adaptation closer to US\$ 50 billion annually,<sup>(4)</sup> while the United Nations Development Programme (UNDP) suggests this could spiral to US\$ 86 billion annually by 2015.<sup>(5)</sup> The longer it takes to implement an effective international agreement to reduce and then halt greenhouse gas emissions, the higher these costs of adaptation will be and the more likely that the limits to adaptation will be reached and exceeded.

**BOX 1**  
**Key terms and acronyms**

AAU	Assigned Amounts Units (levels of "allowed emissions" under the Kyoto Protocol)
AF	Adaptation Fund (under the Kyoto Protocol)
CDM	Clean Development Mechanism (a carbon trading mechanism under the Kyoto Protocol that allows countries with GHG reduction targets to generate emissions reductions by investing in clean development in low- and middle-income countries)
CIF	World Bank Climate Investment Funds
COP	Conference Of the Parties to the UNFCCC
G77	The Group of 77 is a large negotiating alliance of low- and middle-income countries. The name comes from the Joint Declaration of the Seventy-Seven Countries in 1964 formed during international trade negotiations
GEF	Global Environment Facility
IATAL	International Air Travel Adaptation Levy
IMERS	International Maritime Emissions Reduction Scheme
IMO	International Maritime Organization
LDC	Least Developed Country
LDCF	Least Developed Countries Fund (a UNFCCC fund for adaptation)
MDTF	Bangladesh Multi-Donor Trust Fund
NAPA	National Adaptation Programme of Action
ODA	Official Development Assistance
PPCR	Pilot Programme on Climate Resilience (part of the World Bank Climate Investment Funds)
SCCF	Special Climate Change Fund (under the UNFCCC)
SIDS	Small Island Developing States
SPA	Strategic Priority "Piloting an Operational Approach to Adaptation" (a fund for adaptation under the GEF Trust Fund)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

The costs of adaptation in cities will account for a significant proportion of this average, largely because of the expense required to adapt (or, in the case of many low- and middle-income countries, build new and resilient) infrastructure and services for densely populated areas. The United Nations Framework Convention on Climate Change (UNFCCC) estimates that adapting infrastructure worldwide could require US\$ 8–30 billion in 2030, one-third of which would be for low- and middle-income countries.<sup>(6)</sup> Yet, this wide-ranging estimate is at the conservative end of the scale because it is based on adapting existing infrastructure, without taking into account the large deficit in basic infrastructure in most urban centres in low- and middle-income nations.<sup>(7)</sup>

Existing international funding to support adaptation needs in low- and middle-income countries comes from two main sources: first, dedicated climate change funds under the UNFCCC and second, through ODA. Currently, both of these avenues fall significantly short of meeting the costs of adaptation in low- and middle-income countries. This paper will begin by exploring the opportunities and challenges for financing adaptation through the UNFCCC mechanisms and will consider recent innovative proposals that could help bring these funds closer to the amounts that are required. Recognizing that UNFCCC channels alone cannot meet the full costs or the full scope of supporting activities to build resilience to climate change, the role of ODA and potential tensions and complementarities with the UNFCCC will be discussed. Finally, it will be noted that raising funds for adaptation at the international level is not enough as

5. UNDP (United Nations Development Programme) (2007), *Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World*, UNDP, New York, USA.

6. UNFCCC (United Nations Framework Convention on Climate Change) (2007), "Analysis of existing and planned investment and financial flows relevant to the development of effective and appropriate international response to climate change", Background Paper, UNFCCC, Berlin, Germany.

7. Satterthwaite, D, S Huq, M Pelling, H Reid and P Lankao Romero (2007), "Adapting to climate change in urban areas: the possibilities and constraints in low- and middle-income nations", Human Settlements Discussion Paper Series, Climate Change and Cities 1, IIED, London.

long as barriers to accessing and using these funds for the most vulnerable groups in the most vulnerable countries exist. The political and institutional constraints to accessing international funds by vulnerable urban stakeholders will be considered and options will be proposed for ensuring that funding for adaptation reaches those who need it most and can use it well.

## II. FUNDING FOR ADAPTATION UNDER THE UNFCCC

### a. The structure of funding under the UNFCCC

At the first meeting of the Conference of the Parties<sup>(8)</sup> (COP 1) to the UNFCCC in 1995, the Global Environment Facility (GEF) was established as the financial mechanism of the UNFCCC and given responsibility for the transfer of funds under the UNFCCC from high-income to low- and middle-income countries. The original mandate for the GEF in relation to climate change adaptation was to support studies, assessments and planning on vulnerability and adaptation in low- and middle-income countries, as well as capacity building.

At COP 7 in 2001, decision 6 of the Marrakech Accords further requested that the GEF should fund “...*pilot or demonstration projects to show how adaptation planning and assessment can be practically translated into projects that will provide real benefits.*”<sup>(9)</sup> This led the GEF to establish the Strategic Priority “Piloting an Operational Approach to Adaptation” (SPA) under the GEF Trust Fund. COP 7 also gave rise to three new and additional funds beyond those contributed to by the GEF: the Least Developed Countries Fund (LDCF), established under the Convention to support the 49 nations designated as the Least Developed Countries (LDCs)<sup>(10)</sup> to adapt to climate change, and initially used to support the design of National Adaptation Programmes of Action (NAPAs); the Special Climate Change Fund (SCCF), to support a number of climate change activities, including mitigation and technology transfer but intended to prioritize adaptation; and the Kyoto Protocol Adaptation Fund (AF), to support concrete adaptation projects in low- and middle-income countries that are Party to the Protocol. This fund sits under the Kyoto Protocol and is financed from a levy on the Clean Development Mechanism (CDM).<sup>(11)</sup>

Following lengthy negotiations since Marrakech on how to operationalize the LDCF and the SCCF, and despite some reluctance from low- and middle-income countries (for reasons outlined below), it was decided at the end of COP 9 that both these funds should be brought under the guidance of the GEF.<sup>(12)</sup> This gave rise to the current structure of international funding for adaptation under the UNFCCC: three funds managed by the GEF (SPA, LDCF and SCCF), and the AF, under the Kyoto Protocol.

There are a number of reasons why the existing funds managed by the GEF are not adequate for meeting adaptation needs in low- and middle-income countries, and this paper will focus on three of them. First, levels of funding do not amount to anywhere near enough. All three GEF-managed funds are based on ODA-type voluntary pledges and bilateral contributions from donors. This type of contribution is unlikely ever to be able to generate the required levels of funding – especially given that contributions are meant to be additional to ODA – when many high-income nations are failing to meet their 0.7 per cent commitments to ODA in the first place. As of March 2008, the total resources pledged to the LDCF,

8. The COP is the association of the UNFCCC. It meets once a year at each “COP” to review the UNFCCC’s progress. To date there have been 14 “COPs”, the latest having taken place in Poznan in December 2008.

9. UNFCCC (United Nations Framework Convention on Climate Change) (2001), “The Marrakesh Accords and the Marrakesh Declaration”, accessible at [http://unfccc.int/cop7/accords\\_draft.pdf](http://unfccc.int/cop7/accords_draft.pdf) 30.

10. The term Least Developed Country (LDC) is used by the UN, including the UNFCCC, to describe the world’s poorest countries according to the criteria of low income, human resource weakness and economic vulnerability.

11. The Clean Development Mechanism (CDM) is a carbon trading mechanism under the Kyoto Protocol that allows countries with GHG reduction targets to generate emissions reductions by investing in clean development in low- and middle-income countries.

12. Mace, M J (2006), “Adaptation under the UN Framework Convention on Climate Change: the international legal framework”, in W N Adger, J Paavola, S Huq and J Mace (editors), *Fairness in Adaptation to Climate Change*, MIT Press, Boston, USA.

the SCCF and the SPA totalled US\$ 298 million (US\$ 172.8 million to the LDCF, US\$ 75.6 million to the SCCF and US\$ 50 million to the SPA).<sup>(13)</sup> Further, donors are delaying on meeting their pledged commitments because of an alleged lack of adequate and accountable mechanisms in low- and middle-income countries for receiving and disbursing money. This means that the actual funds contained in the LDCF total US\$ 91.8 million, in the SCCF US\$ 59.9 million and in the SPA US\$ 50 million.<sup>(14)</sup> This leaves almost US\$ 100 million pledged to the UNFCCC still outstanding. To illustrate the trivial scale of these contributions, a recent report by Oxfam International pointed out that the total funds delivered to the LDCF are less than the amount spent in the USA on suntan lotion in one month.<sup>(15)</sup>

Second, the governance structure of the GEF has come under criticism from Non-Government Organizations (NGOs) and the academic community for undermining any ownership of adaptation funds by low- and middle-income countries.<sup>(16)</sup> Under article 11 of the UNFCCC, the GEF is required to have "...an equitable and balanced representation of all Parties within a transparent system of governance."<sup>(17)</sup> While decisions by the GEF Council are taken by consensus of all Parties to the Convention, if no consensus is available then a majority of countries, weighted by donation, is required to carry a vote. This means that GEF Council members from countries that make the largest contributions carry the most weight, essentially giving veto power to the group of five largest donor countries.<sup>(18)</sup> This has raised concerns, particularly from low- and middle-income nations represented in the Group of 77<sup>(19)</sup> regarding the decision-making procedures of the GEF, which have eroded its political acceptability. The lack of "one country, one vote" procedure has resulted in a "democratic deficit",<sup>(20)</sup> giving rise to the impression that key decisions are being made by the representatives of powerful countries, beyond the control of weaker constituents.<sup>(21)</sup>

Third, many low- and middle-income countries have expressed concern over the unclear guidance and high transaction costs attached to GEF funding mechanisms. For example, in their comprehensive review of GEF-managed funds for adaptation, Klein and Möhner<sup>(22)</sup> show that the GEF does not provide adequate operational guidance (in the form of programming papers), making it difficult for low- and middle-income countries to apply for project funding. In addition, although funding through the GEF is not formally conditional, requirements attached to funding include burdensome reporting and co-financing criteria. Finally, funding through the GEF is disbursed through implementing agencies such as the UNDP, the United Nations Environmental Programme (UNEP) and the World Bank, which adds further bureaucracy to the process; for example, many LDCs have expressed concern over the functional relationships with implementing agencies inhibiting access to funding for NAPAs from the LDCF.<sup>(23)</sup>

Therefore funding under the GEF is inadequate to meet the current costs of adaptation in low- and middle-income countries, both fiscally and in terms of accessibility.

## b. The Adaptation Fund

The Adaptation Fund (AF) offers a much more promising approach to adaptation funding. The AF is unique in that it has a novel democratic governance structure, decided upon at COP13 in Bali in December 2007.

13. GEF (Global Environment Facility) (2008), "Status report on the climate change funds as of 4 March 2008", Report from the Trustee, GEF, Washington, GEF/LDCF.SCCF.4/Inf.2.

14. See reference 13.

15. Oxfam International (2008), "Climate wrongs and human rights: putting people at the heart of climate change policy", Oxfam Briefing Paper 117, Oxfam, Washington DC, Brussels, Geneva and New York.

16. See reference 3; also Müller, B (2006), "Nairobi 2006: trust and the future of adaptation funding", accessible at [www.oxfordenergy.org/pdfs/EV38.pdf](http://www.oxfordenergy.org/pdfs/EV38.pdf).

17. UNFCCC (United Nations Framework Convention on Climate Change) (1992), "Article 11", in *United Nations Framework Convention on Climate Change*, New York, USA, May.

18. Streck, C (2001), "The global environment facility: a role model for global governance?", *Global Environmental Politics* Vol 1, pages 17–18.

19. The Group of 77 is a large negotiating alliance of low- and middle-income countries that focuses on numerous international topics, including climate change, and seeks to harmonize the negotiating positions of its 131 member states. The name comes from the Joint Declaration of the Seventy-Seven Countries in 1964 formed during international trade negotiations.

20. See reference 16, Müller (2006).

21. See reference 3.

22. Klein, R J T and A Möhner (2008), "Governance limits to effective global financial support for adaptation to climate change", Paper presented at the conference Living with Climate Change: Are There Limits to Adaptation?, Royal Geographical Society, 7–8 February 2008, London, UK.

23. Ayers, J (2008), "Progress in Implementation of NAPAs", *Tiempo* 69, pages 15–19.

24. Müller, B (2007), "The Nairobi climate change conference: a breakthrough for adaptation funding", *Oxford Energy and Environment Comment*, Oxford Institute for Energy Studies, Oxford, UK.

25. See reference 1.

26. See reference 1.

27. See reference 1.

28. These are fuels consumed for international marine and air transport.

29. Parties with commitments under the Kyoto Protocol have accepted targets for limiting or reducing emissions. These targets are expressed as levels of allowed emissions, or "assigned amounts", over the 2008–2012 commitment period. The allowed emissions are divided into "assigned amount units".

30. See reference 1.

31. Müller, B and C Hepburn (2006), *IATAL – An International Air Travel Adaptation Levy*, European Capacity Building Initiative, Oxford, UK.

32. Chambevera, M and B Muller (2008) *Fairer flying: an international air travel levy for adaptation*, IIED Briefing, November 2008.

It is not managed by the GEF but has its own independent board with representation from the five UN regions as well as special seats for the LDCs and Small Island Developing States. The GEF provides secretariat services to the AF on an interim basis. Countries can make submissions for funding directly to the AF, rather than go through a designated implementing agency (as is the case with the GEF-managed funds), and countries also have the authority to designate their own implementing agencies, such as NGOs, to make submissions for funding directly under the AF. It is hoped that the unique structure of the AF will be able to overcome, or at least minimize, the problems of accessibility currently faced with the GEF funds and will increase the effectiveness of climate change financing on adaptation.

In addition, the AF has the greatest potential to generate adequate levels of international funding for adaptation. The revenue generated from the CDM levy alone is projected to be between US\$ 160 million and US\$ 190 million, and potentially much more depending on the volumes traded and prices as targets are set.<sup>(24)</sup> This mechanism for generating funding sets the AF apart from the GEF funding streams. Resources do not come from bilateral donations, thus avoiding the "domestic revenue problem";<sup>(25)</sup> in other words, money raised domestically is likely to be regarded as nationally owned and therefore its allocation could face political resistance. Instead, funds are collected from private sector actors by the CDM executive board, an international, not national, body. This means funds are independent of national treasuries and other domestic agencies.<sup>(26)</sup>

Finally, there is potential to significantly scale up financing under the AF mechanism by applying the levy to other activities.

### c. The potential for new and innovative funding under the UNFCCC

The need to increase the scale of funding for adaptation has been recognized internationally, and a variety of new and innovative mechanisms for doing so have been and continue to be proposed. Two of the most promising<sup>(27)</sup> are discussed here: applying a levy on bunker fuel<sup>(28)</sup> activities; and the international auctioning of Assigned Amounts Units (AAUs)<sup>(29)</sup> under the Kyoto Protocol.

Müller<sup>(30)</sup> suggests that the most "natural" way to generate funding for the AF would be to extend the 2 per cent levy to other, non-emissions-trading, activities. This would be favoured over increasing the levy on the CDM or applying it to other emissions-trading mechanisms, which would increase CDM transaction costs and potentially discourage investment in CDM.

One idea launched in 2006 was to create an International Air Travel Adaptation Levy (IATAL), which has the potential to generate an estimated US\$ 4–10 billion per annum of additional funding for adaptation in low- and middle-income countries.<sup>(31)</sup> Based on the fact that the aviation industry is a significant contributor to global emissions totals, coupled with the need to increase funding for adaptation, IATAL represents a politically, ethically and economically attractive option for generating funding for adaptation.<sup>(32)</sup> IATAL has a two-fold advantage: it will discourage flying and it will raise significant funds for adaptation, particularly from long-haul flights. This presents an equitable option because the costs of the levy

would inevitably fall on passengers who, by the very fact that they are passengers, have a high carbon footprint and also have the capacity to pay. As stated by Müller, "...both conditions...apply to air passengers quite generally: subsistence farmers from Bihar are generally not found on airplanes and people who fly will generally have a significant carbon footprint."<sup>(33)</sup> As such, the option of IATAL has been given serious consideration by legislators and the G8+5.<sup>(34)</sup>

The levy could also be applied to maritime bunker fuels through an International Maritime Emissions Reduction Scheme (IMERS). Discussions around IMERS began in 2006 based on the concept of establishing a "maritime greenhouse gas fund" under the auspices of the International Maritime Organization (IMO), with revenues from an upstream fuel levy and with the aim of spending around 50 per cent (equating to approximately US\$ 2 billion) of the annual revenue on adaptation in low- and middle-income countries. At the 57th session of the Marine Environment Protection Committee in April 2008, a global levy scheme on ships was endorsed as a means of reaching maritime greenhouse gas reduction targets, by using funds instead to purchase carbon emission credits. Under this scheme, all ships engaged in international voyages would be subject to a bunker levy established at a given cost per tonne of fuel bunkered. Such a scheme would both encourage a reduction in the baseline of fuel used and also fund carbon credit purchases.<sup>(35)</sup> If some of the revenues are also applied to adaptation, this would again have the dual benefit of contributing to both global adaptation and mitigation agendas.

The essential feature of all levies on bunker fuels is that they can be designed to deliver genuinely international revenues: funds that cannot readily be tied down to a country, thus resolving the problem of "domestic revenue". Further, one of the chief motivations behind IATAL is that it assigns responsibility to individuals rather than countries. This is significant particularly in low- and middle-income countries with high inequality and growing populations of wealthy individuals, where governments and industry have been accused of "hiding behind the poor"<sup>(36)</sup> in avoiding national emissions reduction targets.

Another way of raising funds for adaptation would be to apply the levy to international auctioning of AAUs. As noted, applying the levy to carbon trading schemes could result in higher transaction costs, inhibiting the success of carbon markets. However, one solution to this has recently been submitted to the UNFCCC by Norway. The suggestion is that a levy be applied to the International Emissions Trading scheme, through which Annex 1 countries<sup>(37)</sup> under the Kyoto Protocol are allowed to trade AAUs with each other. The Norwegian proposal suggests that the adaptation levy could be extended to the carbon market at the point of issuance of AAUs, and therefore the levy would not increase transaction costs when AAUs are traded. Rather, a small portion of permits would be withheld from national quota allocation and then auctioned by the appropriate institution. The resulting revenue could then be placed in a fund to be used for adaptation.<sup>(38)</sup> Müller suggests that this proposal is one of the few workable suggestions for applying the levy to other international trading schemes, as well as one that may be able to generate significant additional funding to meet the costs of adaptation in low- and middle-income countries.<sup>(39)</sup>

While these proposals do represent an opportunity to generate significant funding for adaptation under the UNFCCC, they are still being debated and are likely to be slow coming to fruition. Further, funding

33. See reference 1.

34. The Group of 8 Plus 5 is an international forum for the governments of Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, the United States and the European Union and five developing countries: Brazil, China, India, Mexico and South Africa.

35. IMO (International Maritime Organization) (2008), "IMO environment meeting approves revised regulations on ship emissions", IMO Newsroom, accessible at [http://www.imo.org/Newsroom/mainframe.asp?topic\\_id=1709&doc\\_id=9123](http://www.imo.org/Newsroom/mainframe.asp?topic_id=1709&doc_id=9123).

36. Greenpeace (2007), "Hiding behind the poor", Report by G Ananthapadmanabhan, K Srinivas and V Gopal for Greenpeace India.

37. Annex 1 countries are high-income countries. (Non-Annex 1 countries are low- and middle-income countries.)

38. UNFCCC (2008), "Finance – AWGLCA: Norway's submission on auctioning allowances", UNFCCC, Bonn, Germany, accessible at [http://unfccc.int/files/kyoto\\_protocol/application/pdf/norway\\_auctioning\\_allowances.pdf](http://unfccc.int/files/kyoto_protocol/application/pdf/norway_auctioning_allowances.pdf).

39. See reference 1.

40. Ayers, J and S Huq (2009 forthcoming) "Supporting adaptation through development. What role for ODA?", *Development Policy Review*.

41. Klein, R J T (2008), "Mainstreaming climate adaptation into development policies and programmes: a European perspective", in European Parliament (2008), *Financing Climate Change Policies in Developing Countries*, European Parliament, Brussels, Belgium, PE 408.546-IP/A/CLIP/A/CLIM/ST/2008-13.

42. Adger, W N, S Huq, K Brown, D Conway and M Hulme (2003), "Adaptation to climate change in the developing world", *Progress in Development Studies* Vol 3, No 3, pages 179-195; also Agrawala, S (editor) (2005), *Bridge Over Troubled Waters: Linking Climate Change and Development*, OECD, Paris; Klein, R J T, E L Schipper and S Dessai (2003), "Integrating mitigation and adaptation into climate and development policy: three research questions", Working Paper 40, Tyndall Centre for Climate Change Research, University of East Anglia, UK, accessed 3 September 2006 at [www.tyndall.ac.uk/publications/working\\_papers/working\\_papers.shtml](http://www.tyndall.ac.uk/publications/working_papers/working_papers.shtml); and Klein, R J T, S E H Eriksen, L O Naess, A Hammill, T M Tanner, C Robledo and K L O'Brien (2007), "Portfolio screening to support the mainstreaming of adaptation to climate change into development assistance", Working Paper 102, Tyndall Centre for Climate Change Research, University of East Anglia, UK.

adaptation through the UNFCCC has other limitations. UNFCCC support for adaptation addresses adaptation in the narrowest sense, i.e. adaptation to climate change as distinct from climatic variability. At the level of climate negotiations this distinction is important, because such information informs political questions surrounding costs and burden sharing.<sup>(40)</sup> Funding for adaptation is the responsibility of high-income, high-emitting countries, to be paid to countries most vulnerable to the impacts of those emissions. It is therefore relevant for the negotiations to distinguish between funding for building resilience to climate change (which is additional to ODA contributions) versus that for building resilience to climate variability more generally (which could be included in ODA contributions). Many low- and middle-income countries support this UNFCCC approach in order to prevent industrialized countries from incorporating adaptation funding into development assistance and thereby avoiding providing new and additional funding for adaptation under the UNFCCC. At the June 2008 meeting for the subsidiary bodies to the UNFCCC, low- and middle-income countries called for the measurable, reportable and verifiable use of new and additional funding for climate change-specific activities (as opposed to more general resilience building).<sup>(41)</sup>

However, building adaptive capacity requires actions that focus not only on the measurable and verifiable impacts of climate change but also on a wide range of factors that contribute to a broader reduction in vulnerability to climate variability and climate change.<sup>(42)</sup> It is important that funding is made available for adaptation activities that can also address other, non-climatic, aspects of vulnerability. Such activities have traditionally been the focus of development practitioners, yet the climate regime has not conventionally engaged many of the agencies and actors whose participation in adaptation is essential.<sup>(43)</sup> Given these limitations for assistance for adaptation under the UNFCCC, a second, significant, international source of finance for adaptation must come from ODA.

### III. THE ROLE OF OFFICIAL DEVELOPMENT ASSISTANCE IN FUNDING ADAPTATION

The objectives of development overlap considerably with those of adaptation because vulnerability depends on the capacity of a society to cope with and adapt to climate-related hazards; this is constrained by factors such as lack of resources, poor institutions, governance, inadequate infrastructure and other economic constraints related to a lack of development.<sup>(44)</sup> Given this close relationship, supporting adaptation through development pathways makes sense.<sup>(45)</sup> This section discusses two key ways in which development assistance can finance adaptive capacity in recipient countries: first, through the generation of specific bilateral or multilateral climate change funds, which are independent (but supposedly supportive) of the UNFCCC and intended to fund targeted adaptive initiatives for capacity building and protective infrastructure; and second, through mainstreaming climate change into development. This involves integrating climate change into ongoing development planning to "climate proof" existing development investments, maximize the potential of development projects to enhance adaptive capacity, and avoid maladaptation.<sup>(46)</sup>

## a. Multilateral and bilateral funds for adaptation

Generating funds through bilateral and multilateral institutions can capitalize on the experience of development agencies in reducing vulnerability and channelling funding for international development objectives. The largest and most recent (and controversial) example of such a fund can be drawn from the World Bank Climate Investment Funds (CIFs).

The overall objective of the CIFs is to provide concessional loans for policy reforms and investments that achieve development goals through a transition to a low carbon development path and a climate-resilient economy.<sup>(47)</sup> There are two trust funds under the CIFs: the Clean Technology Fund, focusing on mitigation and investment in low carbon technologies; and the Strategic Climate Fund, which is broader and more flexible in scope and serves as an overarching fund that can support various programmes to test innovative approaches to climate change. The first of these programmes, intended to fund adaptation activities, is the Pilot Programme on Climate Resilience (PPCR), with a target size of US\$ 1 billion, aimed at increasing climate resilience in low- and middle-income countries.

The development of the CIFs in general, and the PPCR in particular, has been shrouded in controversy. First, the original governance structures of the CIFs and PPCR have been heavily criticized as being donor driven,<sup>(48)</sup> potentially undoing the progress made with the AF, which had only been decided upon a few months prior to the announcement of the PPCR. Indeed, the PPCR was originally entitled the Adaptation Pilot Fund, widely interpreted as a move to compete with the AF under the Kyoto Protocol.<sup>(49)</sup> However, a recent revised proposal included a more balanced representation of donor and recipient countries and includes the chair of the AF board (Box 2), in an attempt to link the World Bank initiative to the UNFCCC. At the time of writing, these arrangements were still under discussion.

The main criticism of the PPCR now is regarding the fact that some of the funding under the PPCR will be made available through loans, not grants, and that these loans are to be counted as ODA. The World Bank has justified this decision by reinterpreting the concept of "new and additional", stating that funds "...are new and additional to existing levels of ODA" but that "...it is expected that most donors will include contributions to the CIFs in their ODA reporting."<sup>(50)</sup> Criticism against the PPCR on this basis

### BOX 2

#### The governance structures of the World Bank Climate Investment Funds (CIFs) and the Pilot Programme on Climate Resilience (PPCR)

A trust fund committee would govern the Strategic Climate Fund, with six representatives from donor countries, six representatives from eligible recipient countries, a representative from the World Bank and a representative from partner multilateral development banks. A PPCR sub-committee would oversee the PPCR operations and activities, with two members from the Strategic Climate Fund trust fund committee, six representatives from donor countries, six representatives from recipient countries and the chair of the AF board. Decisions would be by consensus.

SOURCE: CCCD (2008), *Financing Mechanisms for Adaptation*, Secretariat to the Commission on Climate Change and Development, Stockholm, Sweden.

43. Burton, I, E Diringer and J Smith (2006), *Adaptation to Climate Change: International Policy Options*, PEW Centre on Global Climate Change, Arlington, VA, USA.

44. See reference 41; also see reference 40.

45. Dodman, D, J Ayers and S Huq (2009 forthcoming), "Building resilience", in *State of the World 2009: Into a Warming World*, Worldwatch Institute, Washington DC, USA.

46. Maladaptations are actions or investments that enhance rather than reduce vulnerability to impacts of climate change. This can include the shifting of vulnerability from one social group or place to another; it also includes shifting risk to future generations and/or to ecosystems and ecosystem services. In many cities, investments being made are in fact maladaptive rather than adaptive. Removing maladaptations is often the first task to be addressed, even before new adaptations.

47. World Bank (2008b), "Q&A: climate investment funds", 1 July, World Bank, Washington DC, USA.

48. CCCD (Commission on Climate Change and Development) (2008), *Financing Mechanisms for Adaptation*, Secretariat to the Commission on Climate Change and Development, Stockholm, Sweden; also Müller, B and H Winkler (2008), "One step forward, two steps back? The governance of the World Bank climate investment funds", *Oxford Energy and Environment Comment*, Oxford Institute for Energy Studies, Oxford, UK, February.

49. See reference 1.

50. See reference 47.



51. Thompson, M and S Rayner (1998), "Cultural discourse", in S Rayner and E L Malone (editors), *Human Choice and Climate Change Volume 1: The Societal Framework*, Batelle Press, Ohio, USA.

52. See reference 3; also see reference 4.

53. See reference 40.

54. See reference 42, Klein et al. (2003).

55. See reference 40.

56. See reference 42, Klein et al. (2007).

57. See reference 42, Klein et al. (2007).

58. See reference 42, Agrawala (editor) (2005).

59. See, for instance, the discussions on Durban's adaptation programme in Roberts, D (2008), "Thinking globally, acting locally – institutionalizing climate change at the local government level in Durban, South Africa", *Environment and Urbanization* Vol 20, No 2, October, pages 521–538.

raises an important point about funding for adaptation: that responsibility for assisting the most vulnerable countries in coping with the impacts of climate change must be additional to existing aid commitments and based on the "polluter pays principle", pointing towards responsibility-based rather than burden-based criteria.<sup>(51)</sup> Financing for adaptation is not owed to poor countries as "aid" but, rather, as compensation from high emissions countries for those that are most vulnerable to the impacts.<sup>(52)</sup> This principle is specifically recognized by the UNFCCC through article 4.4, which specifies that developed countries have committed to helping "particularly vulnerable" countries meet the costs of adaptation, and this principle upheld in decisions regarding the allocation of the UNFCCC funds but not by funding adaptation through ODA.<sup>(53)</sup>

## b. Mainstreaming into ODA

In the context of ODA, mainstreaming adaptation means working through existing channels of ODA to integrate adaptation concerns across the full range of support. Mainstreaming is seen as making more sustainable, effective and efficient use of resources than is the case when climate policies are designed and managed separately from ongoing activities.<sup>(54)</sup>

One way of mainstreaming climate change into development processes is through screening of development portfolios.<sup>(55)</sup> Portfolio screening involves the systematic examination of an agency's set of policies, programmes or projects, with the aim of identifying how concerns about climate change can be integrated into an agency's development priorities.<sup>(56)</sup> Such screening helps both to identify existing development projects that are particularly threatened by climate change and identify opportunities for incorporating climate change more explicitly into future projects and programmes. A review of the screening activities of donor portfolios by Klein and colleagues concluded that between 2001 and 2007, six development agencies screened their development portfolios (Box 3 presents a case study of mainstreaming adaptation into World Bank operations). The authors concluded that while most agencies already consider climate change as a real but uncertain threat to future development, they tend to have given less thought to how different development patterns might affect vulnerability to climate change.<sup>(57)</sup>

Mainstreaming adaptation into climate change is not a "one-stop shop" for financing both adaptation and development priorities in vulnerable low- and middle-income countries. First, development activities are sensitive to a range of climate variables, only some of which can be reliably projected by climate models. Second, there is a mismatch between the temporal and spatial scales of information required for development and climate change planners, particularly where development interventions take place at the local scale where accurate climate data is lacking.<sup>(58)</sup> It is difficult to develop adaptation plans for any urban centre if there is little certainty as to what climate change implies for that particular locality.

Further, there may be trade-offs between development priorities and the actions required to deal with climate change at all levels,<sup>(59)</sup> and climate-proofed agendas of development institutions may find themselves competing with institutions and constituencies whose overriding priorities are economic and social development. In this case, efforts to fully mainstream adaptation into ODA may encounter political and institutional

### BOX 3

#### Mainstreaming climate change into World Bank operations

Burton and Van Aalst suggest that climate risk assessment should become a routine component of World Bank activities where there are significant climate risks, and propose a screening tool to select which projects merit further risk assessment. At the country level, the risks of climate change and variability should be recognized alongside other risks that are routinely assessed, such as environmental impacts, economic risks and political risks, as reflected in Country Assistance Strategies and sector work.

These suggestions fall mostly within the scope of regular World Bank work, but their implementation could be facilitated by the emerging international regime for climate change adaptation, particularly in the financing opportunities under the UNFCCC.

Recommendations for mainstreaming into the World Bank's work include:

- Mainstreaming adaptation through the routine incorporation of climate risk management into World Bank work at the country and project level. The climate risk management should target the whole spectrum of climate change, climate variability and extremes.
- A preliminary screening of projects for climate risk could be quick and straightforward, provided the appropriate climate risk information is readily available. The World Bank could establish a Climate Risk Management Knowledge Base to facilitate this.
- Only for projects at risk would further risk assessments be performed. Tools for such an assessment, best practice examples and access to networks of expertise and experience could also be included in the Climate Risk Management Knowledge Base.
- At the country level, climate risks should routinely be assessed in Country Assistance Strategies and sector work, alongside other risk assessments.
- The development of climate risk screening tools and methods for risk assessment can build upon recent and current World Bank work in the regions. Further development could initially take place on a pilot basis.
- While the development of tools and the collection of information can only take place in the context of particular countries and sectors, and needs go hand in hand with ongoing World Bank work, there is a need for central support and coordination.

The World Bank has since begun to develop a screening tool to help project developers assess whether proposed investments face significant climate risks. The computer-based package would also provide sources of information and expertise on ways to reduce a project's vulnerability. The World Bank suggests that in the longer term it could become a standard tool for screening new projects for climate risk early in the project cycle.\*

\*See Burton, I, E Diringer and J Smith (2006), *Adaptation to Climate Change: International Policy Options*, PEW Centre on Global Climate Change, Arlington, VA, USA.

SOURCE: Adapted from Burton, I and M Van Aalst (2004), "Look before you leap: a risk management approach for incorporating climate change adaptation into World Bank operations", Working Paper 100, Environment Department, The World Bank, Washington DC, USA.

resistance, especially if they entail new conditionalities. Objections by recipient countries may be particularly strong where new measures are not accompanied by increased assistance, so that it appears that existing aid flows are being diverted to needs other than development.<sup>60</sup> In such instances where conflicts arise, adaptation would involve designing and implementing measures that are more targeted to specific threats than development interventions tend to be, and mainstreaming would then ensure that development activities themselves are not maladapted to climate change.<sup>61</sup> However, it should be recognized that much of what is part of a pro-poor development agenda will contribute to reduced risks and vulnerabilities to most of the likely impacts of climate change – for instance, as provision for good quality piped water, sanitation, storm and surface drainage, all-weather roads and paths and health care are extended to "slums" and informal settlements.<sup>62</sup>

60. See reference 43; also see reference 41.

61. See reference 42, Klein et al. (2007).

62. See reference 7.

63. Huq, S and J Ayers (2008), "Streamlining adaptation to climate change into development projects at the national and local level", in European Parliament, *Financing Climate Change Policies in Developing Countries*, European Parliament, Brussels, Belgium, PE 408.546-IP/A/CLIP/A/CLIM/ST/2008-13..

64. See reference 43.

65. See reference 40.

Given that there can be trade-offs between development and adaptation priorities, ODA cannot be seen to "plug the gap" left by inadequate climate change finance under the UNFCCC.<sup>(63)</sup> Funding for adaptation must be in addition to ODA funds, and not all development choices can be dictated by climate change priorities. From a political standpoint, it is most plausible to pursue adequate financing for adaptation within the UNFCCC. Further, given that future adaptation needs are closely tied in with the achievement of international greenhouse gas reduction targets, it makes sense to build on, rather than compete with, the climate change apparatus already established under the Convention.<sup>(64)</sup> ODA certainly has a role to play in supporting the UNFCCC<sup>(65)</sup> by funding adaptation activities beyond the narrow remit of the Convention; however, this role is additional (but related) to the obligations of the formal climate change management frameworks of the UNFCCC.

#### IV. ACCESS TO ADAPTATION FINANCE BY URBAN STAKEHOLDERS

Within the international climate change arena, there seems to be a pre-occupation with estimating the costs for adaptation and raising the funds to meet those costs. Underpinning this concern over funding amounts is an apparent assumption that, were adequate funding available for low- and middle-income countries to adapt, then adequate adaptation could take place. However, this overlooks the fact that there is a significant deficit in "absorptive capacity"<sup>(66)</sup> of many low- and middle-income countries and the most vulnerable groups within them to access these funds and then to use them for their intended purposes. Problems with accessing funds at the international level have already been discussed and highlight the need to support capacity-building initiatives to ensure that vulnerable low- and middle-income countries are able to access funding when it is available. At the country level, there is a need to think carefully about the receiving of funds and the delivery mechanisms through which this funding can be disbursed for the purposes of adaptation. There are obviously key roles for city and municipal governments.

Experience with adaptation funding under the UNFCCC has shown that in-country, institutional responsibilities for adaptation are unclear and sometimes in competition.<sup>(67)</sup> With the increasing proliferation of bi- and multi-donor and Convention funds available, it is vital to avoid duplication of efforts and ensure consistency in approach. One solution that is currently being piloted in Bangladesh is the development of a country-owned multi-donor trust fund (MDTF), through which all funding for adaptation could then be channelled. The fund would pool money obtained from different national and multilateral climate change funds and be managed by a board of trustees. To date, the UK government's Department for International Development (DFID) has pledged UK£ 75 million in grant funding to initiate this fund, and this has been matched by a national pledge by Bangladesh of US\$ 45 million to demonstrate its commitment to the progress of the MDTF.<sup>(68)</sup> It is hoped that such a framework could significantly reduce transaction costs for global and bilateral funds and pave the way for large fund flows in the future, while ensuring proper institutional structures, governance, management and targeting of funds at the national level.

66. See reference 1.

67. See reference 22.

68. UK/Bangladesh Climate Change Conference organized by the UK Department for International Development, 10 September 2008, Royal Geographical Society, London, UK.

The scale and scope of the MDTF are still under discussion at the time of writing, but it is hoped that the fund would be accessible to the government agencies, NGOs and private sector actors who work with vulnerable communities at the local level. However, a recent announcement that the World Bank is likely to take at least interim (two years) responsibility for the governance of the fund has raised alarm bells, particularly from NGOs concerned that this may result in bureaucratic and functional problems similar to those already faced with the international, and in particular the GEF-managed, adaptation funds.<sup>(69)</sup> Discussions concerning MDTF governance remain ongoing.

It is also important that the institutions and agencies through which funds are channelled to the people most at risk from climate change are given careful consideration. Given that most of those most vulnerable to climate change are the poorest people in low-income countries, for adaptation funding to be effective in reducing vulnerability these groups must be targeted by adaptation resources. Adaptation to climate change at this level requires local knowledge, local competence and local institutional capacity.<sup>(70)</sup> However, the success of adaptation at the local level relies heavily on supportive institutional environments created by the levels above. Successful adaptation requires both the involvement of local groups and civil society organizations with the knowledge and capacity to act and a willingness among local and national governments to work with and support low-income and vulnerable groups.<sup>(71)</sup> Achieving such synergies among this range of stakeholders depends critically on how (or in many cases whether) adaptation funding is made accessible to those who need it on the ground. An ongoing study by the International Institute for Environment and Development (IIED) has identified five main strategies for channelling resources to adaptation:<sup>(72)</sup>

- integrating adaptation into national planning;
- social transfers for building adaptive capacity;
- multi- and bilateral-funded projects for adaptation;
- international and national or local NGO-managed adaptation; and
- private sector provision of adaptation goods and services.

The study evaluates each of these channels against their ability to achieve “adaptation by the poorest”. Each “channel” was assessed against its scale, impact on indicators of adaptive capacity (including poverty, health, education and governance)<sup>(73)</sup> and “pro-poor” effectiveness.

Early findings from the review demonstrate the need to use different funding strategies in combination under varying circumstances, to ensure adaptation that benefits those most at risk and most vulnerable. For example, channelling funds through government institutions can be advantageous in terms of scale and efficiency of resource allocation and this can also have beneficial impacts on the governance indicators of adaptive capacity. However, significantly, achieving adaptation that benefits the poorest groups requires government capacity and a willingness to work with them and their organizations. In a review of constraints on the adaptive capacity of urban areas in low- and middle-income countries, Satterthwaite and colleagues show that in the most vulnerable cities in low- and middle-income countries, one-third or more of the population and workforce live and work in illegal settlements that local governments often refuse to work with or even recognize. The authors argue, “...you

69. See reference 68.

70. See reference 7; also see reference 59; and Awuor, Cynthia B, Victor A Orindi and Andrew Adwerah (2008), “Climate change and coastal cities: the case of Mombasa, Kenya”, *Environment and Urbanization* Vol 20, No 1, April, pages 231–242.

71. See reference 7.

72. IIED (forthcoming), “Adaptation by the poorest”, Report funded by the World Wildlife Fund (WWF), UK, IIED, London, UK. The authors of the study recognize that these are not mutually exclusive or competing means of addressing adaptation; rather, the aim of the study is to consider in which contexts different combinations of channels can be most effective.

73. Acknowledging that direct measurement of adaptive capacity is inherently problematic, the authors assessed it on the basis of other indicators that exhibit a strong statistical relationship with successful responses to climate-related events. Summarizing the work of Adger et al., which identifies 18 indicators as statistically significant, the authors developed four broad categories of indicators related to income, health, poverty and governance. For the full report and further details, see Adger, W N et al. (2005), “Social-ecological resilience to coastal disasters”, *Science* Vol 309, No 5737, 12 August, pages 1036–1039.

cannot fund a pro-poor adaptation strategy if the city government refuses to work with the poor, or sees their homes, neighbourhoods and enterprises as 'the problem'." The authors conclude that the capacity of local governments to ensure provision for infrastructure and for disaster risk reduction and preparedness is pivotal for avoiding catastrophic impacts of climate change, and yet this capacity is lacking in the urban areas that need it most.<sup>(74)</sup>

Conversely, while civil society actors, particularly NGOs, are sometimes lauded for their ability to access and support local level and community-based approaches, the benefits that NGOs can achieve are largely dependant on the political context in which they operate. Civil society efforts require practical structures for collaboration with government; and where the agenda of NGOs conflicts with that of the state, NGOs are obliged to respect the priorities of national development strategies in deciding where to place and how to handle their resources. Further, accountability towards funders rather than beneficiaries can result in NGOs marginalizing the lowest-income groups they claim to represent.

However, financing adaptation through governments while also supporting civil society can increase the effectiveness of both. Increasing NGO capacity can strengthen lobbying of low- and middle-income country governments on behalf of the poor and help hold governments accountable for service delivery, which can provide some assurance to donors of the effectiveness of aid channelled through national systems. Likewise, linking NGOs to national planning processes can increase accountability of the NGOs and the processes they manage. Further, NGOs are well placed to encourage uptake of services provided by other channels to the poorest groups, given their access to local communities and capacity to communicate messages in locally appropriate contexts. Finally, simultaneously supporting adaptation through NGOs and government and non-government systems can encourage state support for civil society actions and encourage scaling up of community-based approaches.<sup>(75)</sup> But NGOs also need to be accountable to low-income groups and recognize the knowledge, resources and capacities they can bring to adaptation.

In an urban context, in areas where vulnerability can be ascribed to the failures or limitations in local government, financing adaptation should be used both to address this problem and work around it. Funding could be channelled through civil society organizations that do have direct access to, and a history and knowledge of working with, the poorest, as well as private sector initiatives that can offer goods and services not provided by the government. There are also channels through which funding can support community-driven "adaptation+development" directly, for example through local grassroots-local NGO-local government partnerships.<sup>(76)</sup> In addition, institutional support for local level adaptation needs attention. Any fiscal support must be accompanied by, or used for, the strengthening of institutional capacity and accountability at the city and sub-city levels of government in order to reduce these gaps between local and national processes and ensure that financial resources reach those who can use them best.

Clearly, the relative weight and combinations of different adaptation finance strategies will depend on the specific local and wider contexts of climate change vulnerabilities. While these conclusions are seemingly common sense, political expediency often results in an overemphasis on one funding strategy at the expense of others,<sup>(77)</sup> for example adaptation

74. See reference 7.

75. See reference 72.

76. Mitlin, Diana (2008), "With and beyond the state; co-production as a route to political influence, power and transformation for grassroots organizations", *Environment and Urbanization* Vol 20, No 2, October, pages 339–360.

77. See reference 72.

projects financed through large multilateral agencies are currently being prioritized over other mechanisms, while streamlining adaptation through national plans is widely regarded as a “win-win” option for climate proofing national development. There is a need for further research into how, and under what circumstances, combinations of different channels can be best designed to facilitate access to funding for adaptation by the most vulnerable groups.

## V. CONCLUSIONS

The costs of adaptation to address current and near-term future risks arising from climate change are huge, and at present the formal funding mechanisms under the UNFCCC for meeting these costs fall far short of what is needed. Innovative proposals are being discussed currently, which have the potential to bolster UNFCCC funds, and there is some optimism about the scale and capability of the AF to become the key avenue through which international commitments on adaptation should be channelled. However, it is unlikely, certainly in the near future and probably ever, that finance for adaptation under the UNFCCC can meet all the adaptation needs of low- and middle-income countries. International funds through development assistance can contribute to meeting this shortfall. Yet, financing adaptation through overseas development assistance raises its own set of political and ethical problems concerning the responsibilities of high-income countries to pay for the costs of climate change in addition to aid commitments. Further, discussions on how to finance adaptation tend to overlook the local and national political and institutional constraints on achieving adaptation even with adequate finance, and bypass considerations of how to channel funding to those who need it and can use it most effectively.

These conclusions do point to an opportunity for complementarity between UNFCCC and ODA international funding streams for adaptation. Given the overlap between development and adaptation objectives, there must be a role for ODA in financing adaptation that is independent but supportive of the UNFCCC.<sup>(78)</sup> Development assistance takes a more inclusive approach to vulnerability reduction and so can be used to address the underlying drivers of vulnerability associated with poor institutional capacity. Convention funds could be packaged with ODA assistance to support broader climate risk management strategies in vulnerable low- and middle-income countries.<sup>(79)</sup> International donors are well positioned to strengthen national capacity, while development practitioners and disaster risk reduction practitioners also have a wealth of experience in dealing with reducing vulnerability to climate hazards and extremes at local, sub-national and national scales.<sup>(80)</sup> ODA therefore has a role in funding adaptation, and channelling funds through development organizations can help build the necessary local and national institutional capacity to receive and use UNFCCC funds appropriately, as and when they become available to any reasonable degree.

78. See reference 40.

79. See reference 43.

80. See reference 40.

REFERENCES

- ActionAid (2007), *Compensating for Climate Change: Principles and Lessons for Equitable Adaptation Funding*, Action Aid, Washington DC, USA.
- Adger, W N, S Huq, K Brown, D Conway and M Hulme (2003), "Adaptation to climate change in the developing world", *Progress in Development Studies* Vol 3, No 3, pages 179–195.
- Adger, W N, Terry P Hughes, Carl Folke, Stephen R Carpenter and Johan Rockström (2005), "Social-ecological resilience to coastal disasters", *Science* Vol 309, No 5737, 12 August, pages 1036–1039.
- Agrawala, S (editor) (2005), *Bridge Over Troubled Waters: Linking Climate Change and Development*, OECD, Paris.
- Awuor, Cynthia B, Victor A Orindi and Andrew Adwerah (2008), "Climate change and coastal cities: the case of Mombasa, Kenya", *Environment and Urbanization* Vol 20, No 1, April, pages 231–242.
- Ayers, J (forthcoming), "Implementing NAPAs: are we there yet?", *Tiempo* (accepted for publication).
- Burton, I, E Diringer and J Smith (2006), *Adaptation to Climate Change: International Policy Options*, PEW Centre on Global Climate Change, Arlington, VA, USA.
- Burton, I and M Van Aalst (2004), "Look before your leap: a risk management approach for incorporating climate change adaptation into World Bank operations", Working Paper 100, Environment Department, The World Bank, Washington DC, USA.
- CCCD (Commission on Climate Change and Development) (2008), *Financing Mechanisms for Adaptation*, Secretariat to the Commission on Climate Change and Development, Stockholm, Sweden.
- Dodman, D, J Ayers and S Huq (2009 forthcoming), "Building resilience", in *State of the World 2009: Into a Warming World*, Worldwatch Institute, Washington DC, USA.
- GEF (Global Environment Facility) (2008), "Status report on the climate change funds as of 4 March 2008", Report from the Trustee, GEF, Washington, GEF/LDCF.SCCF.4/Inf.2.
- Greenpeace (2007), "Hiding behind the poor", Report by G Ananthapadmanabhan, K Srinivas and V Gopal for Greenpeace India.
- Huq, S and J Ayers (2008), "Streamlining adaptation to climate change into development projects at the national and local level", in European Parliament (2008), *Financing Climate Change Policies in Developing Countries*, European Parliament, Brussels, Belgium, PE 408.546-IP/A/CLIP/A/CLIM/ST/2008–13.
- IIED (forthcoming), *Adaptation by the Poorest*, Report funded by the World Wildlife Fund (WWF), UK, IIED, London, UK.
- IMO (International Maritime Organization) (2008), "IMO environment meeting approves revised regulations on ship emissions", IMO Newsroom, accessible at [http://www.imo.org/Newsroom/mainframe.asp?topic\\_id=1709&doc\\_id=9123](http://www.imo.org/Newsroom/mainframe.asp?topic_id=1709&doc_id=9123).
- Klein, R J T (2008), "Mainstreaming climate adaptation into development policies and programmes: a European perspective", in European Parliament (2008), *Financing Climate Change Policies in Developing Countries*, European Parliament, Brussels, Belgium, PE 408.546-IP/A/CLIP/A/CLIM/ST/2008–13.
- Klein, R J T and A Möhner (2008), "Governance limits to effective global financial support for adaptation to climate change", Paper presented at the conference Living with Climate Change: Are There Limits to Adaptation?, Royal Geographical Society, 7–8 February 2008, London, UK.
- Klein, R J T, E L Schipper and S Dessai (2003), "Integrating mitigation and adaptation into climate and development policy: three research questions", Working Paper 40, Tyndall Centre for Climate Change Research, University of East Anglia, UK, accessed 3 September 2006 at [www.tyndall.ac.uk/publications/working\\_papers/working\\_papers.shtml](http://www.tyndall.ac.uk/publications/working_papers/working_papers.shtml).
- Klein, R J T, S E H Eriksen, L O Naess, A Hammill, T M Tanner, C Robledo and K L O'Brien (2007), "Portfolio screening to support the mainstreaming of adaptation to climate change into development assistance", Working Paper 102, Tyndall Centre for Climate Change Research, University of East Anglia, UK.
- Mace, M J (2006), "Adaptation under the UN Framework Convention on Climate Change: the international legal framework", in W N Adger, J Paavola, S Huq and J Mace (editors), *Fairness in Adaptation to Climate Change*, MIT Press, Boston, USA.
- Mitlin, Diana (2008), "With and beyond the state; co-production as a route to political influence, power and transformation for grassroots organizations", *Environment and Urbanization* Vol 20, No 2, October, pages 339–360.
- Müller, B (2006), "Nairobi 2006: trust and the future of adaptation funding", accessible at [www.oxfordenergy.org/pdfs/EV38.pdf](http://www.oxfordenergy.org/pdfs/EV38.pdf).
- Müller, B (2007), "The Nairobi climate change conference: a breakthrough for adaptation funding", *Oxford Energy and Environment Comment*, Oxford Institute for Energy Studies, Oxford, UK.
- Müller, B (2008), "International adaptation finance: the need for an innovative strategic approach", Background Policy Paper for the Climate Strategies Project on Post-2012 Policy Framework: Options for the Tokyo G8 Summit, Oxford Institute for Energy Studies, UK.
- Müller, B and C Hepburn (2006), IATAL – *An International Air Travel Adaptation Levy*, European Capacity Building Initiative, Oxford, UK.

- Müller, B and H Winkler (2008), "One step forward, two steps back? The governance of the World Bank climate investment funds", Oxford Energy and Environment Comment, Oxford Institute for Energy Studies, Oxford, UK, February.
- Oxfam International (2007), "Adapting to climate change: what's needed in poor countries, and who should pay", Oxfam Briefing Paper 104, Oxfam, Washington DC, Brussels, Geneva and New York.
- Oxfam International (2008), "Climate wrongs and human rights: putting people at the heart of climate change policy", Oxfam Briefing Paper 117, Oxfam, Washington DC, Brussels, Geneva and New York.
- Roberts, D (2008), "Thinking globally, acting locally – institutionalizing climate change at the local government level in Durban, South Africa", *Environment and Urbanization* Vol 20, No 2, October, pages 521–538.
- Satterthwaite, D, S Huq, M Pelling, H Reid and P Lankao Romero (2007), "Adapting to climate change in urban areas: the possibilities and constraints in low- and middle-income nations", Human Settlements Discussion Paper Series, Climate Change and Cities 1, IIED, London.
- Streck, C (2001), "The global environment facility: a role model for global governance?", *Global Environmental Politics* Vol 1, pages 17–18.
- Thompson, M and S Rayner (1998), "Cultural discourse", in S Rayner and E L Malone (editors), *Human Choice and Climate Change Volume 1: The Societal Framework*, Batelle Press, Ohio, USA.
- UK/Bangladesh Climate Change Conference organized by the UK Department for International Development, 10 September 2008, Royal Geographical Society, London, UK.
- UNDP (United Nations Development Programme) (2007), Human Development Report 2007/2008: Fighting Climate Change: Human Solidarity in a Divided World, UNDP, New York, USA.
- UNFCCC (United Nations Framework Convention on Climate Change) (1992), "Article 11", in United Nations Framework Convention on Climate Change, New York, USA, May.
- UNFCCC (United Nations Framework Convention on Climate Change) (2001), "The Marrakesh Accords and the Marrakesh Declaration", accessible at [http://unfccc.int/cop7/accords\\_draft.pdf](http://unfccc.int/cop7/accords_draft.pdf) 30.
- UNFCCC (United Nations Framework Convention on Climate Change) (2007), "Analysis of existing and planned investment and financial flows relevant to the development of effective and appropriate international response to climate change", Background Paper, UNFCCC, Berlin, Germany.
- UNFCCC (2008), "Finance – AWGLCA: Norway's submission on auctioning allowances", UNFCCC, Bonn, Germany, accessible at [http://unfccc.int/files/kyoto\\_protocol/application/pdf/norway\\_auctioning\\_allowances.pdf](http://unfccc.int/files/kyoto_protocol/application/pdf/norway_auctioning_allowances.pdf).
- World Bank (2006), Clean Energy and Development: Towards an Investment Framework, ESSD-VP/I-VP, World Bank, Washington DC, USA, 5 April, x+38 pages.
- World Bank (2008b), "Q&A: climate investment funds", 1 July, World Bank, Washington DC, USA.