Financing Adaptation

PRACTICAL ACTION
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This briefing provides an overview of the alternatives for financing adaptation. By way of introduction, the following section reviews current estimates of the costs of adaptation and the funding mechanisms that existing under the UNFCCC. The second section examines alternative funding strategies, looking first at established alternatives (such as insurance and disaster risk reduction funding), and second at proposed mechanisms to channel money into adaptation. The latter are considered from the point of view of where and how the money is raised, and how the money is distributed.

1. Introduction

Estimating the cost of adaptation

The World Bank [1]

- The World Bank estimate **$9-41bn** a year, based on the estimated proportion of ODA, FDI and domestic investment that is sensitive to climate change.
- The World Bank costing does not account for the
  - ◊ costs of climate proofing existing stock of natural and physical capital;
  - ◊ costs of new investments needed because of climate;
  - ◊ costs faced by households, communities or NGOs.

Oxfam [2]

- Oxfam has produced an alternative cost measure, based on
  - ◊ scaling up the current costs of community-based projects
  - ◊ scaling up the most urgent immediate needs (based on existing NAPA estimates)
  - ◊ identifying other hidden costs (protecting ecosystems, providing global public goods such as crops or desertification measures, preventing greater gender inequality, building capacity, other unknowns)
- On this basis Oxfam estimate that adaptation will cost at least **$50bn** a year.
- An 'Adaptation Financing Index' has been developed by Oxfam to establish who should pay, based on responsibility, capability and equity (75% EU and US).

[1] Oxfam, Adapting to climate change, May 2007
[2] Oxfam, Adapting to climate change, May 2007

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UNFCCC Working Group 8 Dialogue Report

- The Working Group offer an estimate of the additional financial investment and flows needed for adaptation in 2030. They are: globally US$49-171bn, with **US$28-67bn** in non-Annex I countries.[3]
- Note that the figures 'can be interpreted as the investment and financial flows needed for adaptation in 2030 in addition to the investment and financial flows needed under a situation in which there is no climate change. There are several assumptions underlining these estimates and these should be taken as indicative estimates only.'[4]
- Note also that private funding can be expected to cover some costs (in particular in developed countries). Additional public funding will be required in particular in countries and sectors that are 'highly dependent on external funding for support'.[5]
- The estimated costs are broken down by sector[6]:

Sector	Global	Non-Annex I Parties
Agriculture, forestry and fisheries	14	7
Water supply	11	9
Human health	5	5
Coastal zones	11	5
Infrastructure	8–130	2–41

UNFCCC funding mechanisms

- At present there is no compulsion to fund adaptation under UNFCCC.[7]
- Three levels of adaptation activity are identified: stage 1: planning (short term), e.g. studies of impacts and capacity building, options for adaptation; stage 2: preparation (medium term); stage 3: initiation (long term), i.e. facilitating adaptation.[8] Funding of stage 3 is therefore required for adaptation measures to be implemented.
- 'At a multilateral level, World Bank funding for adaptation totalled around $50m between 2001 and 2006, mainly channelled through the Global Environment Facility. Four new international funds have, however, been established for raising the finance needed for developing-country adaptation.'[9]
- **The Least Developed Countries Fund** 'in operation under the Global Environment Facility (GEF) since 2001, is for addressing LDCs' most urgent and immediate adaptation needs. It relies on voluntary contributions for funding.'[10] The fund supports the preparation of NAPAs, but does not yet cover the cost of actual implementation of adaptation measures.[11]

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[3] UNFCCC Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention, Fourth workshop Vienna, 27–31 August 2007, Dialogue working paper 8 (2007) Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change, August 2007 p21
[4] UNFCCC Dialogue working paper 8 (2007) (*ibid.*) p20
[5] UNFCCC Dialogue working paper 8 (2007) p5
[6] UNFCCC Dialogue working paper 8 (2007) p21
[7] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[8] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[9] Oxfam, Adapting to climate change, May 2007. note that GEF has six focal areas, including biodiversity, CC and land degradation. Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[10] Oxfam, Adapting to climate change, May 2007
[11] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63

- **The Special Climate Change Fund** 'operational under the GEF since 2005, is for funding adaptation planning and technology transfer in all developing countries. It also relies on contributions for funding.'[12] 'Funding criteria are that projects are country-driven, based on national priorities and geared to towards sustainable development.'[13]
- **The Adaptation Fund** 'which is not yet operational, will fund 'concrete' (actual) adaptation measures in developing countries. At start up, its main flow of funds will come from a 2 per cent levy on carbon credits generated under the Clean Development Mechanism (CDM).'[14]
- **The Strategic Priority on Adaptation** 'set up by the GEF in 2006 as a three-year initiative to pilot capacity-building adaptation measures, is funded by $50m from GEF Trust Funds.' [15]
- Total funds promised to date from all sources: $232m. [16]
- The SEI conclude that the global funds administered by GEF are inadequately funded and technically inadequate in terms of efficiency, fairness and in responding to developing countries' needs. 'Both the complex design of the funds and the poor implementation of the guidance are to blame.'[17] The financial facilities have priorities, eligibility criteria and disbursement criteria established by the COP and subject to COP and GEF guidance. However, there has been non-adherence in all areas and a lack of guidance from GEF, making it extremely difficult for developing countries to apply. 'Instead of being provided with straightforward opportunities for adaptation funding, developing countries need to adapt their projects so as to secure support for their proposed adaptation activities.'[18]

[12] Oxfam, Adapting to climate change, May 2007
[13] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[14] Oxfam, Adapting to climate change, May 2007
[15] Oxfam, Adapting to climate change, May 2007
[16] Oxfam, Adapting to climate change, May 2007
[17] Möhner and Klein, The Global Environment Facility: funding for adaptation or adapting to funds?, Stockholm Environment Institute, June 2007
[18] Möhner and Klein, The Global Environment Facility: funding for adaptation or adapting to funds?, Stockholm Environment Institute, June 2007

Summary of existing financial mechanisms:[19]

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 ($5 M) to support community-based adaptation	
(c) Special Climate Change Fund (SCCF)	Voluntary contributions from 11 developed countries (Canada, Denmark, Finland, Germany, Ireland, Netherlands, Norway, Portugal, Sweden, Switzerland and the United Kingdom)	**45.4 million** (Contributions: 36.7 M Pledged: 8.7 M)	5/CP.7, 7/CP.7, 5/CP.9 GEF/C.24/ 12; GEF/C.25/ 4/Rev.1	• Additional cost of adaptation measures • Sliding scale for co-financing	• Addresses adaptation as one of the four funding priorities	GEF allocation of 2.0 M was used for projects and administrative support.
(d) Least Developed Countries Fund (LDC Fund)	Voluntary contributions from 13 developed countries (Canada, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, New Zealand, Norway, Spain, Sweden, and Switzerland as of 30 April 2006)	**75.7 million** (Previous contributions: 29.9 M Pledged: 45.8 M GEF allocation to date: 11.8 M)	5/CP.7, 7/CP.7, 27/CP.7, 28/ CP.7, 29/CP.7, 6/CP.9 3/CP11, 4/CP11 GEF C/24/Inf.7; GEF/C.24/Inf.8/ Rev.1; GEF/C.25/ 4/Rev.1	• Guiding principles: country-driven approach, equitable access by LDCs, expedited support and prioritisation of activities • Provision of full cost funding for adaptation increment as identified and prioritised in NAPAs • Sliding scale for co-financing	• Implementation of NAPAs (all projects for the preparation of NAPAs in 44 countries approved with a budget of US$ 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/CP7	

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

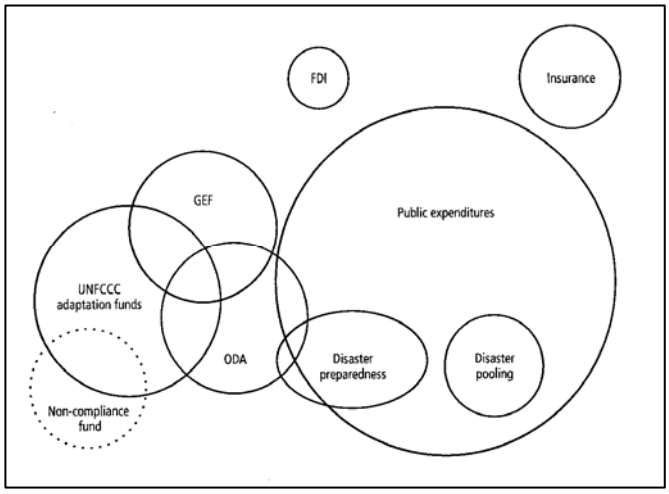
2. Alternative funding

Established alternatives

- **Non-compliance fund** proposed in 1997 and would collect fees from Annex I countries for exceeding emissions ceiling of 30% (relative to 1990) by 2020.[20]

[19] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006 (http://enviroscope.iges.or.jp/modules/envirolib/upload/897/attach/06_adaptation.pdf)
[20] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63

- **Disaster relief and risk reduction:** DRR funding comes from ODA, regional banks and national governments and is widely acknowledged to reduce vulnerability to climate variability when incorporated in development projects.[21]
- **Public expenditure:** Unlike developed countries, developing countries are unlikely to hold back funds for CCA and with diverging income between developing and developed countries the opportunities for self-sufficiency diminish. Activities can be complemented by PPPs (public, private corporations, NGOs and possibly regional banks).[22]
- **Insurance and pooling:** IPCC TAR notes opportunities for the insurance sector and society through use of insurance as a proactive measure to cover against extreme weather losses. Can also help by demanding minimum standards for construction and land use planning. Micro- credits and insurance can increase resilience. However further research is required and insurance may still be too expensive for many. The EU Solidarity Fund is an example of pooling allowing the EU to respond to catastrophic losses. Pooling is specifically government funded.[23] AOSIS suggest 'an internationally sourced pool of funds' to insure the most vulnerable countries who cannot afford to insure themselves; plus collective loss sharing mechanisms and international solidarity funds to address high impact events.[24]
- **FDI:** exceeds ODA and national policy could be used to direct FDI towards adaptation, e.g. through building codes. Regional bank subsidies to meet the associated cost increases would increase the attractiveness to FDI. [25]
- **ODA**: Currently some ad hoc funding for adaptation measures is from ODA.[26] Note, however, the view of many that adaptation funding should not be conflated with ODA: adapting to climate change adds to the cost of achieving MDGs and there is already a massive development deficit (only 0.36% of developed country GNI promised by the G8 in 2005).[27]
- This diagram illustrates the overlapping relationships between the established alternative sources of funding in developing countries. The size of circle indicates relative contribution. For example, disaster pooling is likely to play a relatively small role in adaptation and is entirely government funded.[28]



Relationship between established alternative sources of adaptation funding (Bouwer and Aerts 2006)

[21] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[22] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[23] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[24] UNFCCC, Submission from AOSIS, Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention, Vienna, August 2007
[25] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63
[26] Oxfam, Adapting to climate change, May 2007
[27] Oxfam, Adapting to climate change, May 2007
[28] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63

Proposed alternatives

- The following tables examine proposed alternative mechanisms for funding adaptation. The proposals are considered from the point of view of the financing mechanism (column 2) and the distribution of the funds (column 3).
- There are several broad categories of proposed alternatives in terms of how they are to be financed. In the next table, the following dominant funding themes emerge:
    - Four proposals are **fossil fuel based** (two carbon tax, one aviation tax and one waiving the subsidy on fossil fuels)
    - Four are calculated on the basis of emissions **responsibility and ability to pay**– plus one further scheme is financed through a fixed percentage of rich country GDP
    - Two are financed through a **levy on emissions trading** (similar to the CDM contribution to the Adaptation Fund).
- Two approaches seek to **relax the rules** of the existing funding mechanisms.
- The final two tables list **risk management** and **risk transfer** approaches: the focus on risk distinguishes these from the majority in the first table. The risk transfer approaches are essentially financial engineering, whilst the risk management approaches are contributions based (two from the members of scheme and one on RAP).
- All the proposals are low in detail on how the distribution of the funds should be regulated.
- Little attention has been given to how funds could be distributed to ensure they reach poor communities. Bouwer and Aerts recognise the role played by NGOs in reaching communities, but also the difficulty of access to adaptation funds: 'current funding mechanisms require an official government application. Although NGOs try to work closely with the government, communication is suboptimal in many instances. Moreover, fundraising by an NGO through the government would severely threaten its independent status and thus its ability to work effectively with communities.'[29]
- Insurance mechanisms figure strongly in proposed approaches, but it is unclear how these approaches could benefit poor communities. Risk transfer through micro-insurance based 'weather hedges' comes closest to addressing this point. However, whilst insurance may be effective in aiding recovery in some instances, it is likely to remain too expensive for many poor communities. [30]

[29] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63 Whilst acknowledging the important role played by NGOs in developing adaptation at the community level, Bouwer and Aerts also suggest that capacity building in relation to scientific knowledge is required.
[30] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63

Fossil Fuel Tax Approaches				
		Financing	Distribution of funds	Comment
1	**Solidarity Fund/ Climate Change Insurance Fund**[31]	Financing 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.**	**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	Fossil fuel tax plus other mechanisms. As with GEF, the rules governing Solidarity Fund distribution would be critical to effectiveness.
2	**International Air Travel Adaptation Levy (IATAL)**	$10 per ticket would raise $8bn; alternatively raise price with ticket price, plus levy for first/business class.[32] **Links adaptation to reducing aviation emissions**.[33]		Essentially a targeted fossil fuel tax. Müller suggests that 'such "innovative financing" ideas are gaining acceptance, for it is ultimately only private sector financing which might be able to provide the sort of sums that the World Bank Report estimates are required for adaptation funding.'[34]
3	**Carbon taxes**	Use percentage of **carbon tax** to fund adaptation (polluter pays).[35]		Carbon tax can end up being neutral to the economy (making it politically acceptable).[36] Alternatively, other approaches link tax and justice.
4	**End fossil fuel subsidies**	Use money to finance adaptation (**UK gives an effective annual subsidy of $17.5bn in waived airline fuel taxes**).[37]		

[31] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006
[32] Oxfam, Adapting to climate change, May 2007
[33] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006
[34] Müller, Adaptation funding, Background report prepared for the Gleneagles Dialogue government working groups, Mexico, June 2006
[35] Oxfam, Adapting to climate change, May 2007
[36] e.g. New Zealand (http://www.guardian.co.uk/environment/2005/may/05/environment.society); and proposals in the US (http://www.carbontax.org/introduction/#no-tax-increase)
[37] Oxfam, Adapting to climate change, May 2007

Responsibility plus Ability to Pay Approaches				
		Financing	Distribution of funds	Comment
1	**AOSIS Convention Adaptation Fund/ Insurance Fund**	Creates link between emissions and Convention obligations on adaptation funding, comprising responsibility (**emissions**) and a (GDP-based) ability to pay index; both relative to 1990. Money could also be raised from an **insurance levy**, based on the assumption that increased uncertainty leads to greater profit; and increased adaptation benefits insurance through risk reduction.[38]	**International insurance fund:** paid for out of the CAF and with payouts tied to governments having taken reasonable steps to reduce risks, thus both supporting risk management and providing compensation.[39]	Responsibility plus ability to pay plus insurance levy. Unclear how uncertainty can increase insurers' profits if risk reduction also benefits insurance companies.
2	**ICCTF proposal[40]**	1. Guarantee revenue for adaptation, with contributions linked, in part at least, to **current and historical responsibility for emissions** 2. **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	Unclear if disaster 'mitigation' funds would be available to NGO projects or only government (and therefore probably large scale/ not pro-poor) schemes.
3	**UNFCCC Impact Response Instrument[41]**	Establish UNFCCC Disaster Relief Fund to be financed by binding up front contributions from industrialised countries (based on **historical responsibility** for climate change and **ability to pay**)	To cover the costs of the international relief effort for climate-related disasters. Relief, rehabilitation and recovery to be covered by the instrument but not this fund.	Disaster relief is retrospective (and therefore not adaptation); link to existing relief mechanisms is unclear.[42]
4	**Two track approach[43]**	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 **mainstreaming** of risk management in development processes, and of adaptation policies across sectors (including agriculture and water).	Fixed GDP contribution for Annex 1 countries is a form of responsibility + ability to pay without the complicated sums.

[38] UNFCCC, Submission from AOSIS, Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention, Vienna, August 2007
[39] UNFCCC, Submission from AOSIS, Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention, Vienna, August 2007
[40] ICCTF (International Climate Change Task Force), Meeting the Climate Challenge: Recommendations of the International Climate Change Task Force, ICCTF, 2005. http://www.americanprogress.org/kf/climatechallenge.pdf
[41] Müller, An FCCC impact response instrument as part of a balanced global climate change regime, 2002 http://www.oxfordclimatepolicy.org/publications/iri.pdf
[42] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006
[43] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63.

Levy on Emissions Trading Approaches				
		Financing	Distribution of funds	Comment
1	Jaeger's Levy and Insurance[44]	Levy on emissions trading	Levy used to buy insurance for adaptation costs and damage compensation	Distribution is entirely retrospective.
2	Enhancing the base of adaptation fund	Adaptation levy on JI and IET (as well as CDM).[45] Oxfam support CDM-style 2% levy on other carbon trading schemes. Auctioning of certificates could be introduced in emerging carbon markets and the money raised used for adaptation. [46]		Increases funding available in the existing Adaptation Fund. Srinivasan notes that developed countries are reluctant to see any extension of the CDM levy to other instruments.[47]

[44] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006
[45] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006
[46] Oxfam, Adapting to climate change, May 2007
[47] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006

Simplifying the Rules Approaches				
		Financing	Distribution of funds	Comment
1	Simplified UNFCCC rules	UNFCCC funding will currently only be provided to meet incremental costs (those due to impacts from anthropogenic CC) and costs that have global causes, but not those with regional causes (climate variability, land-use changes, socio-economic changes). Funding is not agreed for measures with local benefits, which is particularly the case for adaptation. The difficulty of measuring incremental costs remains an obstacle for stage 3 funding.[48]	1. Rules could made such that **full funding could be provided for adaptation projects in developing countries**, and linked to other environmental benefits (thus linking to the other conventions and funds operated by GEF). Vulnerability and adaptation studies could provide basis of prioritising limited funds.[49] 2. Mace suggests that 'A new understanding of these terms [incremental costs and global benefits] is needed … Guidance to the GEF will have to reflect that **adaptation is itself of global benefit**'[50]	Essentially reform - targets problems identified with current funding mechanisms.
2	TERI's Alternative perspective[51]	1. New financing for adaptation 2. Additional financing at national level – to **top-up development aid** 3. Special compensatory financing designed on fairness and **polluter pays** principle	1.For measures which provide **regional and global public goods** 2. To support the provisioning of goods and services to **enhance adaptive capacity at the country level** 3. To support activities and measures that **reduce vulnerability of individuals and communities** in developing countries	Based on an assessment of current adaptation activities. The first distribution mechanisms is essentially a relaxation of the problematic GEF 'incremental costs' rule.

[48] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63.
[49] Bouwer and Aerts, Financing climate change adaptation, Disasters, 2006, 30(1): 49-63.
[50] Mace, Adaptation under the UNFCCC: the legal framework, Justice in Adaptation to Climate Change International Seminar, August 2003. Mace's full text reads 'A new understanding of these terms [incremental costs and global benefits] is needed in the context of adaptation that recognizes the Parties' shared concern for the protection of populations, cultures, environments and ecosystems vulnerable to the impacts of climate change. Guidance to the GEF will have to reflect that adaptation is itself of global benefit, though it will be undertaken unevenly, just as GHG emissions are produced unevenly, but their reduction is viewed to yield a global benefit.'
[51] TERI, Financing adaptation, 2005, prepared for the side event 'Adapting to a changing climate: who bears the burden?', 6 December 2005, on the occasion of the 11th Conference of Parties to the United Nations Framework Convention on Climate Change, 28 November – 9 December 2005, Montreal, Canada.

Risk management approaches:[52]				
		Financing	Distribution	Comment
1	International Insurance Pool	**Mandatory contributions** from industrialised countries **in proportion to their GHG emissions and GNP.** To be administered by a Board under the UNFCCC (Hamilton 2004; Linnerooth- Bayer et al 2003; Muller 2002).	A collective loss-sharing fund to compensate the victims of sea-level rise.	
2	Public-Private Insurance Partnerships	**Public-Private Insurance Partnerships**		
3	Regional Catastrophe Insurance Schemes	**Mandatory contributions** from member governments will be used to pool regional cash reserves. These schemes or risk pools could be backed by a regional facility that provides a layer of reinsurance cover.	**Lending to members affected by a weather catastrophe** (DFID 2004).	
4	Micro-insurance	**Risk-pooling.** 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	**Provide compensation** to low income individuals or groups adversely affected by a specified risk or event (Hoff et al. 2004).	

[52] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006

Risk transfer approaches: [53]				
		Financing	Distribution	Comment
1	Catastrophe bonds	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.	**Provide private insurers with protection against extreme natural catastrophe events.**	
2	Weather derivatives	Weather derivatives 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	Financial mechanisms developed to hedge financial risk associated with weather volatility.	
3	Weather hedges	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	Provide farmers with protection against extreme weather events.	

[53] Srinivasan, Adaptation to Climate Change, in Asian Aspirations for Climate Regime beyond 2012, IGES, 2006